

Field Exchange

Emergency Nutrition Network



Special section on COVID-19 nutrition programming

**Nutrition SMART
villages INDIA &
BANGLADESH**

**Large scale food
fortification
HAITI**

**Calculating
people in need
AFGHANISTAN**

**Streamlining
national SMART
surveys KENYA**

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Women's meetings being conducted by Poshan Sakhi using participatory learning and action methods

Dear readers,

A warm welcome to the 65th edition of Field Exchange. This edition features a range of programming issues that unfortunately reflect that we are still in the midst of the COVID-19 global pandemic. But, on the positive side, the experiences reflect how the nutrition sector continues to innovate to accommodate this new reality, coming up with new ways to ensure continuity of services whilst also ensuring pre-COVID projects and research have continued and, in doing so, are building critical evidence.

Given that, our edition features a special section on COVID-19 nutrition programming adaptations across Asia and Africa. An article from Rwanda describes the characteristics of an effective risk communication and community engagement strategy to address myths and misconceptions around nutrition and COVID-19. Related to this theme of communication, two field articles describe adaptations made to infant and young child feeding (IYCF) programmes in Somalia and Lebanon. In both contexts, more women were reached than in the year prior to COVID-19; in Lebanon due to the use of remote communications and in Somalia due to an increased frequency of counselling meetings. The reallocation of funds through flexible donor funding greatly enabled innovation.

Remote ways of working emerged as a feature in several articles in this special section. A field article from Madagascar highlights the experiences of carrying out a remote Integrated Acute Mal-

nutrition Phase Classification (IPC) exercise for government – the first remote IPC to be undertaken worldwide, while a research article from Cox's Bazar in Bangladesh describes the experiences of adapting standard SMART methodology to enable SMART surveys to be possible in the COVID-19 context. Remote innovation is also reflected in an article by GOAL where breastfeeding videos were used to support one-to-one IYCF counselling in Ethiopia, applicable to the COVID-19 context but, in this instance, implemented to save the time of busy health workers. Rising to the challenge of disrupted food supply chains due to the COVID-19 pandemic, a team from the Philippines describe the 'move food' initiative, where a novel non-governmental organisation-led system supported the movement of food from farmers to consumers during a time of restricted movement, also serving to reduce food waste. This has proved so successful that it is set to continue. 'Innovations' around COVID-19 programming are a mixed bag. Some of the COVID-19 programme adaptations may be a compromise too far in the long term and are a temporary solution until full service can be resumed. Others may be developments that were long overdue but, fast-tracked by the urgency of the crisis, are here to stay. Commitment to documenting learning on processes and outcomes remains critical in order to distinguish the difference.

Field Exchange features some nice examples of multi-sector programming from South Asia embedded in or supporting local government systems and services and with some signs of

promising nutrition impact. A mid-term evaluation of the UNICEF-supported Swabhimaan initiative shows promising change in adolescent and maternal undernutrition indicators as well as improved household food security. This programme, integrated within the Government of India's flagship poverty alleviation programme, Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM), mobilises village level collectives of women and strengthens the access of women and adolescents to services. A field article authored by Welthungerhilfe shares the implementation of the 'SMART nutrition villages' model in 200 villages in India and Bangladesh. Again, village institutions are used as a platform to support communities to plan and implement multi-sector nutrition activities and access government entitlements. Half of the project villages showed marked improvement in women's and children's dietary diversity and in water, sanitation and hygiene (WASH) practices but not in wasting prevalence. A field article from Nepal describes how WASH actions that were integrated across Suaahara II districts through local government coordination and capacity building demand the creation of improved facilities and behaviours and engagement with the private sector on supply chains. Monitoring data showed successful uptake of some promoted WASH behaviours in both non-intensive and intensive areas, with a greater change over time in intensive areas.

These three examples of multi-sector programming show some positive directions but, in some instances, a lack of anticipated nutrition

impact, yet again reflecting the complexity of undernutrition. This is further echoed in several articles in this edition, including two from Tufts University that examine the multiple drivers of undernutrition in Africa's drylands. Young et al argue that there is a need for innovative interdisciplinary research and learning to better understand the basic drivers in each context and for researchers, programmers and policymakers to engage more closely to build consensus on solutions. The need for 'joined up' thinking and action – this time across wasting and stunting – is reflected in an article by Action Contre la Faim on the drivers of concurrent child wasting and stunting (WaSt) in Liberia. While they found the principle driver of stunting in this context was limited access to markets, the drivers of WaSt were younger child age, recent episodes of diarrhoea, a child being taken care of by a non-immediate family member and reduced coping and support of caregivers. The authors reflect that an analysis of the drivers of stunting alone would not have prompted interventions to address the risks associated with WaSt which is associated with higher mortality.

The global burden of micronutrient deficiencies also continues to demand collective action and innovation for scale. Working with government and the private sector, an article on the USAID-funded RANFOSE describes how this collaboration supported the government of Haiti to legislate for food fortification and worked with private sector companies to influence manufacturing practice. As a result, fortified products are now increasingly replacing unfortified products on the Haitian market.

Accurate nutrition data is critical to inform caseload projections, programme planning and budgets. A field article on Nutrition Information Systems (NIS) in Kenya describes how SMART surveys were streamlined, harmonised and institutionalised under the coordination and leadership of the national Nutrition Information Technical Working Group. The NIS in Kenya is now 'owned' and largely funded by government, with greater use of high-quality nutrition data to inform timely nutrition and multi-sector actions. Strong government leadership and coordination and a shift over time in the focus of international agencies and donors from emergency programming to a health systems strengthening approach were key success factors.

The ongoing challenge of estimating people in need in the absence of current data is reflected in an article by UNICEF Afghanistan. In this instance, the team combines historical data, Seasonal Food Security Assessment data and mid-upper arm circumference (MUAC) screening data from Health Management Information Surveys. By no means coming up with a perfect or simple solution, the authors describe what they are trying in highly constrained contexts. Another longstanding information challenge is our dependence on prevalence data for wasting which underestimates caseloads and limits trend analysis. An article by the World Food Programme describes a new mathematical model to generate an incidence correction factor in six Sahelian countries which accounted for frequent food insecurity, seasonal variation and COVID-19 in the region. As suspected, this led to a higher estimated burden of wasted children (5.35 vs. 4.54 million

originally projected). As we go to press, long overdue incidence correction factors for wasting are for imminent release by UNICEF; watch ENN's home page for updates.

Finally, how to treat wasting at scale is a theme across several articles. This was the focus of the recent global CMAM conference hosted by Concern Worldwide that aimed to facilitate an exchange of evidence and experiences on CMAM scale-up in fragile contexts. A background paper by ENN identified drivers and barriers to CMAM scale-up from global and national key informants. Siloed nutrition and health workforce teams, inadequate investment in community health workers, the need to streamline ready-to-use therapeutic food (RUTF) requirements and the costs of RUTF, as well as shorter supply chains, were also identified as crucial. Related to this, several articles are on the continued 'hot' topic of simplified approaches to wasting treatment. This includes a UNICEF review of the use of simplified approaches across 21 different countries and an article by Première Urgence Internationale that describes how Mother MUAC in a CMAM programme in Chad increased screening coverage and the proportion of severely wasted children admitted for treatment. The Simplified Approaches Working Group, co-led by UNICEF and IRC, has also just launched a new website (<https://www.simplifiedapproaches.org/>) with resources and emerging guidance on simplified approaches.

It takes courage but also requires care to act 'outside the box'. It is heartening to see the commitment and drive on simplified approaches to treat wasting to improve service coverage, but we must make sure we do not unnecessarily sprint (and trip up) as we run. Evidence on different types of 'simplification' is varied; for example, the state of evidence for rolling out Family MUAC is at a very different stage to reduced dosage of RUTF. We are not yet there on the pathway to scale, but our collective narrative does not seem to reflect that. There are still many important unanswered questions, such as what the implications of different types of 'simple' adaptations for child growth are for very young and older children. As with the COVID-19 adaptations, we should not shy away from innovation and change but be willing to take steps back as well as forward when it is right to do so. We should also make sure that by convening around the latest 'buzz areas' we do not neglect issues to which our attention is overdue, a reminder prompted by a views piece by Fitzpatrick et al that calls for greater investment in research to understand the aetiology, pathophysiology and burden of kwashiorkor.

As always, your experiences spark great discussions amongst the ENN team. Share your thoughts with us – letters to the editor always welcome.

Nicki, Chloe, Marie
Field Exchange editorial team



Nyiraminani Beatrice breastfeeds baby Gael, who is just 1 month old

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Statement of Commitment on Climate by Humanitarian Organisations

Bangladesh during floods



Climate change and the resulting environmental effects are having a profound impact on the world's people, affecting in particular the most vulnerable and poorest. Without drastic changes to reduce greenhouse gas emissions, limit rises in global temperatures and restore biodiversity, climate change emergencies will likely have a major impact on future humanitarian needs. The actions of humanitarian organisations, as vital as they may be, can add to this crisis as the agencies themselves generate environmental and climate impacts.

It is therefore essential that agencies adapt their ways of working to ensure coherence of action, exemplarity and respect the principle of 'do no harm'. Agencies must also adapt to respond to these crises, support resilience building in vulnerable populations and work to preserve and conserve the environment. The solidarity organisations, made up of ACTED, The Alliance for International Medical Action, CARE France, Electriciens Sans Frontieres, Groupe URD, Medecins du Monde, Premiere Urgence Internationale, Secours Islamique France and Solidarites International, have committed to make such changes.

In line with the commitments made by countries at the Conference of the Parties (COP) 21 (also known as the Paris Agreement), reflecting

on the anticipated focus of the COP 26 (taking place in 2021) and conscious of each agency's humanitarian responsibilities, the solidarity organisations have committed to:

1. Measure the environmental and carbon impacts of agencies.
2. Reduce the carbon footprint of agencies, aiming to halve emissions by 2030.
3. Incorporate climatic and environmental risk analysis in all areas of work and promote prevention, mitigation and adaptation actions where relevant.
4. Make a positive impact on the environment by reducing the negative impacts of humanitarian and development actions.
5. Develop and identify local expertise in connection with the Grand Bargain's commitments on localisation.
6. Make information on progress towards these commitments public on an annual basis.
7. Raise awareness across all agency collaborators.
8. Contribute to the project to develop an environmental and climate charter for the entire sector (currently being launched by the ICRC and the Red Cross).

More information can be found at <https://alima.ngo/en/blog/2020/12/15/state-of-commitment-on-climate-by-humanitarian-organisations/>

UNICEF Nutrition Strategy 2020-2030

Report Summary¹



In December 2020, UNICEF published its new Nutrition Strategy, to guide the next ten years of its nutrition related activities. The strategy outlines UNICEF's vision of 'a world where all children, adolescents and women realize their right to nutrition' and highlights strategic objectives to support governments and partners in ending child malnutrition in all its forms. Centered around six results areas, the strategy emphasises a universal premise, that prevention comes first, in all contexts, and if prevention fails, treatment is a necessity. The result areas are:

1. *Early childhood nutrition:* focuses on programming to prevent of all forms of malnutrition in the first five years of life.
2. *Nutrition in middle childhood and adolescence:* encompasses programming to prevent of malnutrition in middle childhood (5-9 years of age) and adolescence (10-19 years of age).
3. *Maternal nutrition:* concentrates on prevention of malnutrition programming in women during pregnancy and breastfeeding as well as the prevention of low birthweight in newborns.
4. *Nutrition and care for children with wasting:*

encompasses programming for the early detection and treatment of children with wasting through facility- and community-based approaches, in all contexts.

5. *Maternal and child nutrition in humanitarian action:* which includes UNICEF's nutrition programming in emergencies, guided by UNICEF's Core Commitments for Children in Humanitarian Action and its commitments as Cluster Lead Agency for Nutrition.
6. *Partnerships and governance for nutrition:* which includes programming to strengthen the enabling environment for nutrition through improved partnerships, data, knowledge, advocacy and financing.

Programme priorities are outlined for each result area. Furthermore, the Strategy recognizes that in order to improve nutrition outcomes, a systems approach is needed and there is a central role to be played by five systems: food social protection, education, water & sanitation and health to deliver diets, services and practices to support adequate nutrition. Priorities for each system are outlined.

The Strategy reflects a number of strategic shifts from previous strategies. Firstly, there is a focus on all forms of malnutrition, including overweight and obesity and a focus on bringing together the prevention of both forms of under-nutrition (stunting and wasting). The UNICEF Conceptual Framework has also been adapted to reflect the broader malnutrition focus. Secondly, while maternal and child nutrition in the first 1,000 days of life remains core to UNICEF programming, a broader focus on nutrition in middle childhood and adolescence is taken to break the intergenerational cycle of malnutrition. There is also a deliberate emphasis on the centrality of nutritious, safe, affordable and sustainable diets and the importance of the food system. More broadly, the strategy focusses on a multisectoral approach to nutrition improvements as well as a greater focus on the role of the private sector to advocate for optimal nutrition practices. Critically, while the strategy has a universal vision and agenda, it calls for approaches to be contextualized- the strategy stresses that UNICEF country programmes are not expected to implement all components but develop context-specific programmes, informed by analysis of the unique determinants, drivers, potential impact pathways and available resources in each context.

¹ <https://www.unicef.org/media/92031/file/UNICEF%20Nutrition%20Strategy%202020-2030.pdf>

CMAM programmes: A handbook to analyse cost-effectiveness

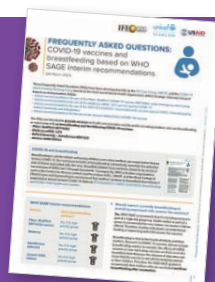


Mark Myatt and colleagues have published a short handbook¹ to help guide nutrition programmers and monitoring and evaluation staff to perform simple cost-effectiveness analysis (CEA) for community-based management of acute malnutrition (CMAM) interventions. CEA is a way of examining the costs and health outcomes of one or more interventions. It enables comparisons between one intervention and another (or to no intervention) by estimating how much it costs to gain a unit of a desired health outcome. Results are presented as a cost-effectiveness ratio, for example cost per year of life gained, cost per case cured or cost per life saved, allowing comparisons between interventions. Without CEA, CMAM may seem an expensive intervention. However, when the cost-effectiveness is tested, it is usually found to be cheap and effective.

This handbook provides a useful guide to CEA in the context of CMAM programming. The handbook covers the types of outcomes used in cost-effectiveness analyses (cases treated, cases cured, deaths averted or disability adjusted life years averted), the creation of counterfactuals to model the absence of an intervention and the building of models of programme outcomes, accounting for uncertainty. It also details the types of costs that need to be considered in CEAs, the methods and tools needed to collect and work with costs data from a variety of sources and how to interpret cost-effectiveness estimates. Examples of CEA for CMAM programmes in Bangladesh, Ethiopia, Kenya and Nigeria are provided that give concrete illustrations of the steps to follow and the results that may be obtained. This book is now available from international booksellers.

¹ Myatt, M et al (2021) A simple approach to cost-effectiveness analysis of community-based management of acute malnutrition (CMAM) Programs. Eliva Press.

Frequently asked questions on COVID-19 vaccines and breastfeeding



Amidst the COVID-19 pandemic and the initiation of COVID-19 vaccinations in different countries from December 2020, varied advice regarding the safety of vaccines for breastfeeding mothers has been emerging. Initially, different scientific and advisory groups recommended that breastfeeding mothers should not receive the vaccine or were cautious about recommending it. However, from January 2021 onwards those recommendations changed, particularly after the issuing of the World Health Organisation (WHO) Strategic Advisory Group of Experts on Immunization (SAGE) interim recommendations for the use of the Pfizer-BioNTech COVID-19 vaccine¹ which clarified that breastfeeding mothers can be safely vaccinated with minimal risk. These WHO interim recommendations were later followed by the interim recommendations for the use of the Moderna mRNA-1273 vaccine against COVID-19² and the interim recommendations for use of the AZD1222 (ChAdOx1-S [recombinant]) vaccine against COVID-19 developed by Oxford University and AstraZeneca.³

In response to the need to ensure that these recommendations are disseminated and adopted at a country level and that breastfeeding mothers are

optimally supported, a set of Frequently Asked Questions (FAQs) has been jointly developed by the IFE Core Group (www.ennonline.net/ife), UNICEF and the COVID-19 Infant Feeding Working Group based on the most recent WHO SAGE guidance. The FAQs are intended to provide answers to healthcare providers and the public, including mothers who are breastfeeding or expressing milk, regarding breastfeeding and the Pfizer-BioNTech, BNT162b2, Moderna and AstraZeneca AZD1222 COVID-19 vaccines. The FAQs are regularly updated and confirm that breastfeeding mothers should be supported to breastfeed and that they can be vaccinated when part of a high-risk group. However, the lack of data available for recommending the vaccine to breastfeeding women is acknowledged by WHO SAGE which has called for this topic to be prioritised by researchers.

Download the FAQs from <https://www.ennonline.net/breastfeedingandcovid19vaccines>

¹ https://www.who.int/publications/i/item/WHO-2019-nCoV-vaccines-SAGE_recommendation-BNT162b2-2021.1

² <https://www.who.int/publications/i/item/interim-recommendations-for-use-of-the-moderna-mrna-1273-vaccine-against-covid-19>

³ https://www.who.int/publications/i/item/WHO-2019-nCoV-vaccines-SAGE_recommendation-AZD1222-2021.1

Food Systems Summit 2021

News Item¹

This year,² the United Nations Secretary-General will convene a Food Systems Summit as part of the Decade of Action to achieve the Sustainable Development Goals. This Summit aims to launch bold new actions to advocate for and accelerate a transformation in the way the world produces, consumes and thinks about food. Five action tracks have been developed to facilitate work to meet the Food Systems Summit's aims and to identify 'game changing and systemic solutions' for the global food system:

1. *Ensuring access to safe and nutritious food for all* – aims to work to end all forms of malnutrition through increasing food availability and affordability and reducing food access inequities.
2. *Shift to sustainable consumption patterns* – aims to build consumer demand for sustainably produced food, strengthening local value chains and promoting recycling of food resources.
3. *Boost nature-positive production* – aims to realign incentives to reduce food loss and environmental impacts and to support small-holder farmers across the food value chain.
4. *Advance equitable livelihoods* – aims to contribute to the elimination of poverty by promoting employment and decent work across the food value chain.
5. *Build resilience to vulnerabilities, shocks and stress* – aims to ensure the continued functionality of sustainable food systems in areas prone to conflict or natural disasters. These actions include a focus on broader global challenges.

Much work has already been done across the action tracks, including 'idea generation' surveys, two public dialogues on each track and the development of discussion starter papers to further drive the work forward. A number of food system dialogues have also been conducted, with more planned in the lead up to the Food Systems Summit in order to support the transformation of the global food system.

¹ <https://www.un.org/en/food-systems-summit/about>

² The tentative date for this Summit is from the 13th September but this is still to be finalised. A pre-Summit gathering is planned for July 2021.

Community-based management of acute malnutrition (CMAM) Conference 2021



Wasting affects 1 in 10 children in Mali

© UNICEF / Bourama Coulibaly

Concern Worldwide and Irish Aid hosted a virtual conference on the community-based management of acute malnutrition (CMAM) in March 2021. The conference aimed to provide a forum for health and nutrition practitioners to exchange evidence and experiences in scaling up treatment services for wasting and nutritional oedema in fragile contexts and translate these into practical actions and advocacy. The conference was a mix of presentations on the 'main stage' and in smaller parallel sessions as well as daily panel discussions. Smaller working groups also met on the last day to identify practical considerations and priority actions to further refine and scale up several of the core CMAM adaptations and approaches (Box 1). These working groups have continued to shape short summary papers on each of the themes that will soon be available along with the main conference report.

All presentations and conference materials are available on the Concern website www.concern.net/CMAM2021. These include case studies summarising the experience of seven governments in scaling up wasting services as well as broader learning from South Asia. A report prepared by ENN in advance of the conference entitled 'Scale-up of severe wasting management within the health system: a stakeholder perspective on current progress' is also available [at the same link](#).

Important themes highlighted during the conference were as follows:

Coverage still remains far too low. Twenty years ago, CMAM promised access, scale and coverage. Coverage has increased tenfold since CMAM was first introduced but much more still needs to be done to realise this promise. This must include revitalising the community aspect – putting the 'C' back in CMAM.

The cost of producing and delivering RUTF must be reduced. To do this, we need to invest in developing alternative formulas that achieve the same or similar outcomes with non-dairy formulations, support more localised production and unlock global competition.

More funding is needed for wasting treatment. We must explore innovative financing mechanisms, such as the Global Financing Facility, particularly to ensure the long-term financing of RUTF supply.

We must continue to simplify protocols and tools to improve access, increase coverage and reduce cost. We need to ensure quality and continuity of services but we must also ensure that the 'perfect' does not become the enemy of the 'good'.

Wasting is a continuum from severe to moderate. There is an arbitrary, unhelpful divide between severe and moderate wasting. We need to improve the continuum of care for wasted children across this spectrum of severity and across age groups – starting from maternal malnutrition through to the management of small and nutritionally at-risk infants under six months through to children under five years of age.

Family MUAC and CMAM Surge are essentially ready to scale while other adaptations – particularly CHW-led treatment of wasting and simplified nutrition protocols – will require more testing, endorsement from the World Health Organization (WHO) and major increases in funding before governments can bring them to scale. The MAMI Care Pathway Package, an integrated, contextualised approach for managing small and nutritionally at risk infants under six months, is in the early phases of scale up with evidence growing and a formal trial planned in Ethiopia.¹

The update of WHO guidelines on the prevention and treatment of wasting, expected at the end of 2021, is critical to enable scale-up by government. The guideline development process,

currently underway, is expected to review evidence related to CHW-led treatment of wasting, simplified nutrition protocols and the management of small and nutritionally at-risk infants under six months of age.

Integration of services for severe wasting into health systems in all fragile contexts is essential and governments of these countries must play a central role. The Country Operational Road Maps being developed as part of the United Nations-led Global Action Plan on Child Wasting² will inform the development of a Road Map for Action and offer an opportunity to plan strategies and funding to support this more fully.

Innovative approaches and funding to prevent and treat the large caseload of moderately wasted are critical. Of the at least 30 million wasted children currently not covered by treatment services, the majority suffer from moderate wasting. These children will swiftly become more severely wasted and face even higher mortality risk.

A full conference report will be available by the end of May 2021. For more information, please contact Kate Golden at kate.golden@concern.net
Visit: www.concern.net/CMAM2021

¹ <https://www.enonline.net/ourwork/research/mamiriseethiopia>
² <https://www.childwasting.org/>

Box 1 Main adaptations and approaches to CMAM explored in the conference

Simplified approaches

1. Family mid-upper-arm circumference (MUAC)
2. Community health worker (CHW)-led treatment of wasting
3. Simplified nutrition protocols (usually a combination of expanded admission criteria based on MUAC >125mm and oedema, the use of a single treatment product (ready-to-use therapeutic food (RUTF)) for severe and moderate wasting, using modified RUTF dosages based on MUAC not weight)

Other adaptations to improve delivery of wasting services

4. Management of small and nutritionally at-risk infants under six months and their mothers (MAMI)
5. CMAM Surge

Cross-cutting themes

6. Integration of severe wasting services into health systems
7. Management of moderate wasting services

The launch of the Healthy Mothers Healthy Babies Consortium

The Micronutrient Forum and its partners, supported by Kirk Humanitarian and the Children's Investment Fund Foundation, launched the Healthy Mothers Healthy Babies Consortium (HMHB) <https://hmhbconsortium.org/> at a global webinar on 10th March 2021. The consortium aims to generate momentum for coordinated action on maternal nutrition, initially focusing on scaling up access and use of affordable multiple micronutrient supplements (MMS). Through the combined effort of the consortium members, it is envisaged that more pregnant women will benefit from improved nutrition through MMS, have healthier pregnancies and thereby give their babies a better chance to survive and thrive.

HMHB members represent a diverse community, united in their vision to increase the global demand, supply and delivery of MMS through effective advocacy, networking and knowledge management. Dr Saskia Osendarp, Executive Director of the Micronutrient Forum, explains, "At the core of this initiative is the belief that women and babies deserve our best, and our best requires us to work together through an inclusive platform that brings advocates and experts across sectors and across the world together around one common agenda and a unified voice".

MMS contain 15 micronutrients that are essential to the health of mothers and their babies. The consortium builds on the strong evidence base that MMS are safe, cost-effective and consistently associated with better birth outcomes compared to iron folic acid (IFA) supplementation alone. Recent systematic

reviews have highlighted that, compared to IFA, using MMS can decrease the risk of low birth-weight, 6-month mortality, preterm birth, small-for-gestational age and stillbirth. Despite this, many women in low- and middle-income countries do not have access to MMS, placing their own health and that of their babies at unacceptable risk.

One of the reasons there is limited access to MMS is because it is not yet on the World Health Organization's Essential Medicines List (EML) which includes the medications considered to be most effective and safe to meet the most important needs in a health system. The list is frequently used by countries to help to develop their own local lists of essential medicines. If MMS were on the EML, this would help open the door for countries to improve access. An application has been made to include MMS on the EML to this end. HMHB is asking its members and stakeholders to write letters of support for this application and has more information on its website on how to take action.

On 31st March 2021, HMHB facilitated an online workshop where participants helped to shape an advocacy agenda for MMS, outlining strategies to improve engagement with the maternal health sector and how the upcoming Nutrition For Growth (N4G) Summit (taking place in Tokyo in December 2021) could be leveraged for global policy and financial commitments to maternal nutrition. A living draft of the advocacy strategy for the N4G Summit ("Maternal Nutrition and Multiple Micronutrient Supplementation: A Commitment Guide for Tokyo's 2021 Nutrition for Growth Summit") can be found at <https://hmhbconsortium.org/nn4g-commitment-guide>

Launch of the Nutrition Year of Action

In December 2020, the Governments of Canada and Bangladesh, in partnership with the Government of Japan, hosted a virtual launch of the Nutrition Year of Action. This began a year-long initiative to address the global hunger and nutrition crisis which will culminate in the Nutrition for Growth (N4G) Summit in Tokyo, Japan, during December 2021. The Year of Action falls midway through the United Nations (UN) Decade of Action on Nutrition, with only five years left to achieve the World Health Assembly (WHA) targets on maternal, infant and young child nutrition, and 10 years to reach the SDGs. Given that the COVID-19 pandemic has exacerbated an already perilous nutrition situation for the most vulnerable, the need for commitment to, and investment in, achieving a world in which all people have access to safe, affordable and nutritious food by 2030 is all the more critical.

At the time of the launch, new data released by the Standing Together for Nutrition consortium highlighted the devastating impacts of COVID-19 on maternal and child nutrition, with an additional 168,000 child deaths predicted over the next two years. Additionally, in the absence of immediate and significant global action, a further 9.3 million children are estimated to be at risk of wasting. Thus, an emphasis on the need for new and revived commitments to achieving the nutrition agenda was made.

To this end, more than US\$3 billion in financing was pledged by various stakeholders with the Government of Canada committing US\$407 million and the Government of Pakistan committing US\$2.18 billion to nutrition programming through to 2025. This was bolstered by various multilateral organisations and non-government organisations with World Vision International pledging an extended US\$500 million to be spent on nutrition by 2025. An annual investment of at least \$700 million per year towards nutrition programming for children, adolescents and women was committed by UNICEF over the next five years and the World Bank committed \$500 million in Early Response Financing from the IDA-19 Crisis Response Window to target countries facing food insecurity crises.

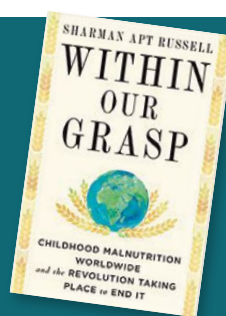
While serving as a basis for renewed action towards eradicating malnutrition, these pledges will meet only a fraction of the global need. As such, the Year of Action provides a platform for further investment via a roadmap of key pledging, momentum building and global moments. With the key pledging moments outlined, namely the UN Food Systems Pre-Summit, the UN Food Systems Summit and the Tokyo N4G Summit 2021, to begin in July, the need to further mobilise resources for nutrition through the coming months is critical to ensuring that the vision for the Year of Action is met.

More information on the launch and a full list of the commitments made can be found here: <https://nutritionforgrowth.org/nutrition-year-of-action-launch-event-recap/>

Within our grasp: Childhood malnutrition worldwide and the revolution taking place to end it

Sharman Apt Russell has recently published a book¹ that examines the urgent problem of childhood malnutrition worldwide and explains why this is an environmental concern as well as a humanitarian one. Intertwined with stories of scientists and nutrition experts, Russell writes of her travels to Malawi, one of the poorest and least-developed countries in the world and also the site of cutting-edge research into childhood malnutrition. She visits Malawian farmers coping with erratic weather patterns due to global warming and highlights an agroecology that relies on more drought-tolerant and nutrient-rich crops.

As she explores new friendships and insights in a country known as 'the warm heart of Africa', Russell describes the programmes that are working best to reduce childhood malnutrition. She explains why the empowerment of women may be the single most effective factor in eliminating childhood malnutrition, which vitamins and minerals are the most essential to a child's development and how much ending malnutrition and stunting will cost. The book is now available from booksellers worldwide.



¹ Russell, S A (2021) *Within our grasp: Childhood malnutrition worldwide and the revolution taking place to end it*. New York: Pantheon Books.



Improving access to nutrition services by strengthening community interventions in the COVID-19 context

Infant and young child feeding in emergencies programming in the context of COVID-19: learnings from a webinar series

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Background

In late 2019, the Infant Feeding in Emergencies (IFE) Core Group¹ webinar committee organised a series of webinars to celebrate the 10 year anniversary of the endorsement of the Infant and Young Child Feeding in Emergencies (IYCF-E) Operational Guidance (OG-IFE, 2017) by the World Health Assembly. This committee is chaired by Save the Children and has representatives from UNICEF, the World Food Programme, Johns Hopkins University, the Center for Disease Control, Emergency Nutrition Network, Technical Rapid Response Team (TechRRT)² and USAID Advancing Nutrition. The aim of the webinar series was to highlight the OG-IFE and showcase best practices from the field on how the guidance has been successfully implemented. However, in early 2020 when COVID-19 was declared a global pandemic and the relevant guidance was issued (GTAM, UNICEF (2020); UNICEF & USAID (2020); World Health Organization (WHO) (2020)), the aim of the webinars was redirected to focus on IYCF-E programmatic adaptations in the context of COVID-19.

Implementation of the webinar series

The webinar series aimed to raise awareness of the updated recommendations for IYCF-E best practices in the context of COVID-19, share best practices and lessons learnt on implementing the OG-IFE in the context of COVID-19, provide examples of programmatic adaptations at the country level and galvanise actors for scaling up evidence-based and collective actions for the effective implementation of the OG-IFE in the context of the COVID-19 pandemic. The webinars were referred to as 'Learning and Sharing Cafés' to reflect the intended informality of the events and to encourage the sharing of programme experiences in a safe space and active engagement and interaction by the audience. The webinars attracted a wide range of practitioners and decision-makers including frontline field workers, staff from government entities, national and international organisations, programme managers, technical advisors in both nutrition and non-nutrition fields, donors and policy- and decision-makers. A process for soliciting interest was initiated by the webinar committee to encourage countries and organisations to prepare presentations on their programme experiences. A total of 15 proposals were received, reviewed and scored by the webinar committee resulting in 12 being included in the final line-up.

The Learning and Sharing Cafés were organised and facilitated under the guidance of the IFE Core Group and TechRRT. Members of the webinar committee led the facilitation of the cafés on a rotational basis. The cafés followed a standard format including a welcome and introductions, an overview of the objectives of the session, the presentation of two or three case studies, an interactive quiz, a facilitated questions and answers session, closing remarks

and a session evaluation. The details of each webinar and the key learning points are summarised in Table 1.

Summary of main programmatic adaptations

Key adaptations and challenges around IYCF-E programming in the context of COVID-19 were shared in the webinars from a wide range of actors in varied contexts. Across these learnings many common adaptations were made. These are summarised as follows:

Practising COVID-19 preventative measures

- Providing personal protective equipment (PPE) for staff and beneficiaries participating in activities
- Installing or increasing access to hand-washing facilities for community-based activities
- Increasing awareness activities on hygiene promotion
- Adapting group counselling to include infection prevention control procedures, including social distancing, hosting less than five individuals per group, ensuring counselling spaces are well ventilated with sufficient space, checking temperature of beneficiaries on entry and monitoring early signs of COVID-19
- Redesigning patient flow and waiting areas to minimise congestion and risk of COVID-19 transmission

Adapting individual and group support activities

- Switching from group counselling to individual one-on-one counselling
- Having a greater reliance on remote counselling and education
- Using a hotline, online platforms and WhatsApp messages for providing counselling and education
- Deploying community nutrition volunteers and using mobile units to reach mothers during lockdown

Capacity-building and developing information, education and communication (IEC) materials

- Launching necessary trainings and capacity building through on-the-job and remote training
- Developing and disseminating necessary IEC materials on IYCF and COVID-19
- Tailoring messages to the COVID-19 context and incorporating COVID-19 related messages into IYCF messages
- Increasing coordination with the Ministry of Health and local authorities

The challenges to programming identified in the experiences shared include a lack of suit-

¹ <https://www.enonline.net/ife>

² Since December 2021, the Technical Rapid Response Team (Tech RRT) has been expanded to form the Technical Support Team (TST) of the Global Nutrition Cluster (GNC) Technical Alliance. More information can be found here: ta.nutritioncluster.net

Table 1 Summary of learning and sharing café sessions

Webinar	Date	Topics and presenters
Launch	6 April 2020	- Infant feeding and COVID-19: Current evidence and recommendations (John Hopkins University) - IYCF-E in the context of COVID-19 (UNICEF) - Communication on protecting, promoting and supporting breastfeeding during COVID-19 (Safely Fed Canada) - How we can continue to protect, promote and support infant and young child feeding (IYCF) in the context of COVID-19 (Save the Children)
Café # 1	30 July 2020	- IYCF programmatic adaptations in the context of COVID-19: resources and tools (IFE Core Group), - Remote IYCF-E support in Colombia (Save the Children Colombia) - IYCF-E in Somalia (Save the Children Somalia)
Café #2	10 August 2020	- How to communicate: infant and young child feeding recommendations in the context of COVID-19 – IYCF-E (USAID/UNICEF) - Adaptations experience in the context of COVID-19 in Somalia (Concern Worldwide Somalia) - IYCF-E adaptations in the mother baby areas of Uganda (Save the Children Uganda)
Café #3	22 October 2020	- IYCF-E to strengthen IYCF practices during COVID-19 in Nepal (Helen Keller International) - Adaptations to routine IYCF activities in response to the COVID-19 pandemic in Jordan (International Medical Corps Jordan) - Kyrgyz Republic adaptation of nutrition programming for COVID-19 (JSI/USAID Advancing Nutrition, Kyrgyz Republic)
Café #4	27th October 2020	- IYCF-E response in Syria during COVID-19 (UNICEF Syria) - IYCF programming during COVID-19 in Sierra Leone (Action Against Hunger and Community Action for the Welfare of Children) - IYCF-E interventions in Lebanon (International Orthodox Christian Charities Lebanon)
Café #5	30 November 2020	- IYCF-E response in South Sudan during COVID-19 (Action Against Hunger South Sudan) - Infant feeding with refugees in Greece (CHEERING) - IYCF-E and COVID-19 in Yemen (International Medical Corps Yemen)

able infrastructure needed to allow social distancing and other hygiene practices, insufficient quantities of PPE including face masks, funding gaps and gaps in human resources to support additional activities. Two detailed case studies are presented in articles within this edition of *Field Exchange* from Somalia³ and Lebanon.⁴

Feedback from the cafés

A total of 1,555 individuals registered for the webinars representing countries from all over the world and 665 (43%) attended the events. The majority of the participants were female (73%). A post-webinar evaluation revealed a high level of participant satisfaction. Results of a rapid survey revealed that 88% were aware of the WHO Breastfeeding and COVID-19 FAQ⁵ and 49% made some adaptations to this document for their own use. A total of 71% of respondents knew the USAID/UNICEF IYCF in the context of COVID-19⁶ counselling package and 48% made some adaptations to this package for their use. This demonstrates a need to continue updating programmers around existing guidance and the

ways that this can be translated into context-specific programme adaptations/guidance.

Several recommendations for webinars in 2021 were made including technical themes such as complementary feeding in emergencies, community-based management of acute malnutrition (CMAM) and IYCF-E, maternal mental health, conducting IYCF-E assessments, developing IYCF-E indicators and adolescent and maternal nutrition linkages with IYCF-E. The webinar committee of the IFE Core Group is planning new webinars in response to these recommendations to share new country case studies and newly emerging guidance and

themes to support the continuation of quality IYCF programming in the light of COVID-19.

The webinars can be found at the following link: https://www.nutritioncluster.net/IYCF-E_learningandsharingcafeseries_presentations

For more information, please contact the IFE Core Group at ife@ennonline.net

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IFE Core Group (2017) Infant and Young Child Feeding in Emergencies, Operational Guidance. Available from: <https://www.ennonline.net/operationalguidance-v3-2017>

³ See article in this edition of *Field Exchange* entitled "Adapting infant and young child feeding interventions in the context of COVID-19 in Somalia"

⁴ See article in this edition of *Field Exchange* entitled, "Infant and young child feeding in emergencies: Programming adaptation in the context of COVID-19 in Lebanon"

⁵ WHO Breastfeeding and COVID-19 FAQ

⁶ USAID/UNICEF IYCF in the context of COVID-19 counselling package

UNICEF & USAID Advancing Nutrition (2020) Counselling Cards on Infant and Young Child Feeding Recommendations when COVID 19 is suspected or confirmed. Available from: <https://www.advancingnutrition.org/what-we-do/social-and-behavior-change/ycf-recommendations-covid-19>

WHO (2020) Frequently asked questions: Breastfeeding and COVID 19. Available from: <https://www.who.int/publications/m/item/frequently-asked-questions-breastfeeding-and-covid-19>



Launch of the MAMI Care Pathway

The MAMI Global Network, co-chaired by the Emergency Nutrition Network (ENN) and London School of Hygiene and Tropical Medicine (LSHTM), has released the MAMI Care Pathway Package, v3.0 (formerly the C-MAMI Tool) - an implementation guidance with resources to support the management of small and nutritionally at risk infants under six months and their mothers (MAMI). Developed in consultation with experts

and practitioners, this integrated pathway of care leverages existing systems and services across health and nutrition, and supports implementation of World Health Organization (WHO) guidelines on wasting management and Integrated Management of Childhood Illness (IMCI). The MAMI Care Pathway requires adaptation for different contexts; implementation experiences will inform future updates.



Access the package at <https://www.ennonline.net/mamicarepathway> including a short orientation video.

To join the MAMI Global Network, contact: mami@ennonline.net and for more information, visit: www.ennonline.net/ourwork/research/mami



Clinical characteristics in children aged 6 to 59 months hospitalized with oedematous severe acute malnutrition (Kwashiorkor), Mwanamugimu Nutrition Unit, Uganda, 2012

Kwashiorkor – reflections on the ‘revisiting the evidence’ series

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The authors would also like to acknowledge James A Berkley (FRCPCH FMedSci), Robert Bandsma (MD, PhD) and Asha Badaloo (BSc, MSc, PhD) who presented at the webinars thereby contributing to this article.

The full recordings of the webinar series can be found at <https://fic.tufts.edu/research-item/revisiting-the-evidence-on-kwashiorkor-malnutrition/>

Background

In 1968, a collection of kwashiorkor researchers and practitioners gathered in Cambridge, Massachusetts for a colloquium to discuss the evidence relating to kwashiorkor. Attendees shared their experiences, understanding and research findings. The merits of the evidence were discussed and debated and a diagnostic criteria for kwashiorkor was determined – bipedal pitting oedema – that remains the primary diagnostic criteria for classifying kwashiorkor today, 50 years later.

Following in the footsteps of these researchers, an informal working group comprised of a new generation of kwashiorkor researchers and practitioners has formed to support each other in the continuing quest to improve the understanding and treatment of kwashiorkor. Members share journal articles, discuss findings and share opinions on points within the evidence. The researchers also discuss their research struggles and help each other with study designs, occasionally collaborating on studies and proposals. Encouraged and supported by the engagement of this working group, several members worked together to initiate a series of webinars to review the current evidence on kwashiorkor and to identify gaps in the evidence.

Three webinars were held towards the end of 2020 covering the following topics: 1) the basic characterisation and treatment of kwashiorkor, 2) observable signs of kwashiorkor and 3) metabolic and biochemical characterisation of kwashiorkor.¹ Three more webinars are planned for the spring of 2021 and, later in the year (pandemic permitting), we hope to host a

public day-long seminar. This will include presentations of the most recent research followed by a discussion with invited researchers to identify research priorities and consider the gaps in current treatment protocols. The group will together determine if sufficient evidence now exists to support diagnostic criteria for moderate kwashiorkor, allowing practitioners to catch cases of kwashiorkor before they progress to severe acute malnutrition with a high risk of mortality. The aim of this article is to reflect on the purpose of these discussions, the webinars covered so far and the next steps to garner interest among Field Exchange readers to engage with this important topic.

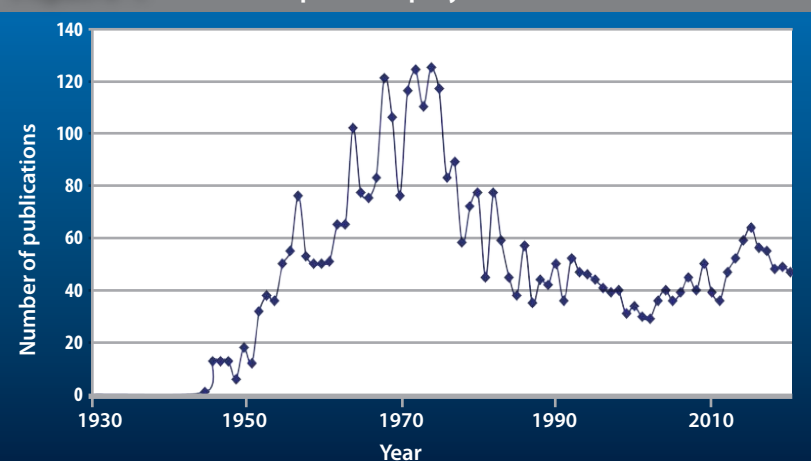
What is kwashiorkor and why is it important to understand it better?

Kwashiorkor is one of two major classifications of severe acute malnutrition. While marasmus is characterised by low weight-for-height, kwashiorkor is diagnosed by bipedal pitting oedema. Other associated signs include pale and brittle hair, skin lesions, lethargy and a fatty liver as well as numerous metabolic anomalies.

More than 4000 articles have been published on kwashiorkor since Cicely Williams introduced the name for this unique syndrome in the 1930s but only a small portion of these articles have been published in the past 40 years (Figure 1). Older publications are primarily descriptive and most recent studies are observational comparisons. Although data on kwashi-

¹ Recordings of the webinars can be found on: <https://fic.tufts.edu/research-item/revisiting-the-evidence-on-kwashiorkor-malnutrition/>.

Figure 1 Peer reviewed articles referring to ‘kwashiorkor’ or ‘oedematous malnutrition’ published per year from 1930 to 2020



Source: Data search from the PubMed website using the terms ‘kwashiorkor’ and ‘edematous malnutrition’ (National Library of Medicine 2021)

orkor is slowly accumulating, only 10 clinical trials specific to kwashiorkor have been conducted, making it impossible to determine causality among all the observed phenomena associated with cases of kwashiorkor. The aetiology of kwashiorkor therefore remains elusive.

Despite its long history, the prevention and treatment of kwashiorkor still relies on very little solid evidence. Not only has research on kwashiorkor languished, no treatment specific to kwashiorkor has been developed and cases of kwashiorkor receive treatment designed to treat marasmus. Although these treatments do support the recovery of children with kwashiorkor, the very different metabolic anomalies and low circulating levels of key amino acids seen in kwashiorkor, even after resolution of oedema, indicate that adjustments to treatment would likely improve both short and long-term outcomes.

Global prevalence of kwashiorkor is difficult to establish. Regardless of the very different metabolic and clinical differences in marasmus and kwashiorkor, studies of acute malnutrition and national nutrition surveys continue to either aggregate kwashiorkor with marasmus or exclude it altogether. Furthermore, normal nutritional surveys to estimate prevalence are poorly designed for the capturing of acute conditions such as kwashiorkor because children with kwashiorkor either die or spontaneously recover in a much shorter time than children with marasmus who may linger in a chronic state of wasting. This exaggerates the differences in the numbers of children with marasmus in comparison to children with kwashiorkor.

Survey teams are also often poorly trained to detect or characterise kwashiorkor. More recently, evaluation of family mid-upper arm circumference (MUAC) programmes reveal that most parents forget to check the presence of oedema when checking the nutrition status of their children (Lort-Phillips & Macias, 2016). Hence, reports on the incidence or prevalence of kwashiorkor are believed to underestimate the scale of the problem. The figures that are available indicate that hundreds of thousands of children are affected and at least tens of thousands die annually (Alvarez et al., 2016). Kwashiorkor tends to cluster in specific regions and communities meaning that aggregate figures

hide areas where kwashiorkor prevalence is alarmingly high (Fitzpatrick et al., 2018; Fonaroff, 1969; Annegers, 1973; Kamalu, 1993). Most concerning is that areas where we know kwashiorkor is the most common type of acute malnutrition, but where prevalence data is poor, are areas where nutritional treatment programmes are also all but non-existent.

The lack of prevalence and incidence data is important because it allows the problem to be ignored. In a self-reinforcing negative cycle, with less visibility and understanding about the aetiology of kwashiorkor and its global prevalence, the condition receives less policy attention and guidance. For example, kwashiorkor was not included in the recent Global Nutrition Report and is not even mentioned on its website² and the 2008 and 2013 Lancet Maternal Child Nutrition Series, which has dominated the formation of nutrition policy over the past 13 years, also did not include any reference to kwashiorkor (Lancet, 2008; Lancet, 2013). When this was pointed out to the authors, their response was there was insufficient evidence of the scale of the problem to include it in the policy priorities.

With the availability of new technologies, we now have the opportunity to review a growing body of evidence, identify the gaps in evidence and design better studies to fully unravel the aetiology and pathophysiology of kwashiorkor and promote surveillance that captures the global scale of the problem. In doing so, we will enable the development of better treatment protocols and prevention strategies which will help to reduce the burden of kwashiorkor and improve the clinical outcomes of hundreds of thousands of affected children each year.

What has been covered in the webinars so far?

The diagnosis of kwashiorkor remains largely based on the observation of oedema. However, many other clinical signs accompany, or may even precede, the development of oedema such as lethargy, loss of appetite, behavioural changes, skin lesions and fatty liver. This therefore indicates that oedema may be a late sign of kwashiorkor and its pathophysiology may be better understood by also considering the other signs of the disease.

The 2019 World Health Organization (WHO) International Classification of Disease defines kwashiorkor as a “form of severe malnutrition with nutritional oedema with dyspigmentation of skin and hair”.³ Skin changes in kwashiorkor have been described for as long as oedema has. However, skin dyspigmentation and hair changes are often missed because the changes can be subtle, requiring skill to detect, and/or require a longer time to manifest. The aetiology of the skin changes is unknown and its relation to other clinical outcomes, especially mortality, is poorly documented. Hence, standardised global assessment of skin characteristics in severe acute malnutrition is required to obtain credible data that may be used to optimise treatment protocols. A tool for grading skin changes, SCORDoK (Scoring of skin changes in severe acute malnutrition) developed by the Department of Dermatology at the Aarhus University Hospital in Denmark, was presented at this webinar. Tools such as SCORDoK may be used to standardise the registration of skin changes in severe acute malnutrition, a necessary first step in building the evidence on relationships between skin changes and kwashiorkor. However, the utility and translatability of SCORDoK in other settings remains to be demonstrated.

The severity of oedema is the main criteria for admission and discharge while other signs such as the treatment of dehydration and skin lesions in kwashiorkor remain largely unoptimised. Dehydration is a topic of contention and conflicting opinions exist on rehydration protocols for children with kwashiorkor. Skin lesions may lead to infections and hypothermia, further endangering the health of already compromised individuals. Hence, management of skin changes in kwashiorkor is important but seldom included in treatment protocols. The integration of a holistic approach, including wound care and pain management, is essential. However, evidence so far of effective treatment strategies has been very heterogenous or scarce and largely built upon expert opinion rather than strong evidence-based research.

The difficulty in the diagnosis and treatment of kwashiorkor stems from our lack of under-

² <https://globalnutritionreport.org/reports/2020-global-nutrition-report>

³ <https://icd.who.int/browse10/2019/en#/E40>

Clinical characteristics in children aged 6 to 59 months hospitalized with oedematous severe acute malnutrition (Kwashiorkor), Mwanamugimu Nutrition Unit, Uganda, 2012



Sofine Heilskov, with thanks to Mwanamugimu and the caretakers of the children

standing of its aetiology. The role of diet, specifically protein deficiency, has been the most popularly described mechanism for the development of kwashiorkor but the results of studies on diets estimating total dietary protein have not been consistent. However, many kwashiorkor study designs start with the assumption that decisive evidence has shown there is no quantitative difference in the diets of children developing kwashiorkor and those developing marasmus. This is based on a misinterpretation of a much-disputed study conducted by Gopalan in 1967 for which the data was never published (Gopalan, 1968). While some more recent studies using food frequency measures have also failed to find a difference (Kismul, Van den Broeck & Lunde, 2014; Lin et al., 2007; Sullivan et al., 2006), two studies that conducted more rigorous quantitative dietary recalls reported that children with kwashiorkor had consumed diets with less protein than children developing marasmus in the same environment (Gupte, 1975; Gupte & Mehta, 1971). A fresh look at the evidence indicates we should not dismiss diet as a major contributing cause of kwashiorkor and any new quantitative dietary research should examine the intake of individual amino acids instead of total protein.

Unravelling the aetiology of kwashiorkor also requires a deep understanding of the biochemical and metabolic perturbations that these children experience, especially in comparison to marasmus. Metabolism of kwashiorkor has been reported to differ from marasmus on several fronts. Protein and lipid oxidation are reduced in kwashiorkor compared to marasmus although these results were observed in the postabsorptive state, where circulating insulin levels are low, thereby affecting both lipid and carbohydrate metabolism. Studies in fed states, which may provide deeper insights into the differences in lipid and carbohydrate metabolism between kwashiorkor and marasmus, are however lacking. Tracing studies performed earlier in Jamaica also indicated an increased demand for sulphur-containing amino acids, cysteine and methionine, in the early rehabilitation phase of kwashiorkor. There is therefore a con-

sensus that the metabolism of kwashiorkor is different from that of marasmus and characterising these as similar diseases is not appropriate and will not be helpful in improving current rehabilitation guidelines. However, despite interesting findings, these studies are observational and did not test causation using randomised controlled trials (RCTs).

One aspect that will benefit from well-designed RCTs is modified therapeutic foods (F75 and ready-to-use therapeutic food) that specifically address the metabolic requirements in kwashiorkor. For instance, apart from reduced protein and lipid oxidation, liver fat accumulation has been observed to be more prevalent among kwashiorkor than marasmus. There is therefore a basis to question whether children with kwashiorkor will benefit more from a rehabilitation food designed to meet their specific metabolic needs. For example, a very small trial showed the faster disappearance of oedema with the addition of cysteine to treatment (Badaloo et al., 2002). On the other hand, promoting a specialised treatment package for kwashiorkor may increase the logistical hurdles and cost, thereby reducing the coverage of rehabilitation programmes. More research is therefore needed to find cost-effective strategies to address kwashiorkor-specific metabolic perturbations.

There is also an ongoing debate as to the role of serum albumin concentration in the oedema associated with kwashiorkor. Oedema is the result of the expansion of the interstitial sector and could be explained by an excessive net transfer of fluid from the vascular system to the interstitial sector. The Starling principle⁴ describes how fluid movement across the capillary membrane depends on the balance between hydrostatic and oncotic pressures on both sides of this membrane. This principle is based on standard physical laws. When the albumin level is reduced, this has an effect on plasma oncotic pressure and leads to an increase of fluid transfer from the vascular to the interstitial sector (Starling, 1896). There are, however, several factors unrelated to Starling's principle that influence the volume of the interstitial sector. For one, the

lymphatic system drains fluid from the interstitial sector back to the plasma using an active mechanism of pumping fluid by lymphatic vessels. This has a major role in regulating the volume of the interstitial sector independently from fluid movement across the capillary membrane. As a result, it is not clear how important albumin is as a determinant of oedema.

Although a causal association remains to be fully demonstrated, there is general agreement that there is an association between kwashiorkor and low serum albumin; nevertheless, many children with low serum albumin concentration do not develop oedema and some adults with ascites and oedema have normal albumin concentrations. More basic research needs to be undertaken on albumin-dependent and -independent mechanisms that drive oedema formation.

Lastly, most of the reports on kwashiorkor rely on cross-sectional observations that attempt to explain a snapshot of a highly dynamic process. Therefore, capturing this dynamic process, either by observing determinants of kwashiorkor before it occurs or by subjecting children with kwashiorkor to a metabolic nudge and monitoring their response, may provide deeper insights into the pathophysiology, or perhaps aetiology, of kwashiorkor. In conclusion, there is still much more we do not know about kwashiorkor and more research, especially targeting mechanistic pathways, is necessary to elucidate the aetiology of this disease.

Details of the upcoming webinars will be announced on the ENN website and the Kwashiorkor: Revisiting the Evidence Webinar website at <https://fic.tufts.edu/event/kwash-series/>. We hope you will join us.

For more information, please contact Merry Fitzpatrick at merry.fitzpatrick@tufts.edu

⁴ Starling's hypothesis, not to be confused with Starling's principle, states that fluid flows from the capillary into the interstitial sector at the arterial end of the capillary and flows from the interstitial sector into the capillary at its venous end (Starling 1896). While Starling's principle remains unquestioned, recent evidence shows Starling's hypothesis is no longer tenable (though it still remains in many text books) (Michel 2004).

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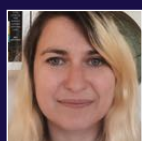
By Helen Young, Abdalmonim Osman, Anne Radday, Anastasia Marshak, Emmanuella Olesambu, Nola Jenkins, Darana Souza and Dr Patrizia Fracassi



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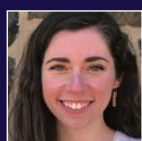
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This article draws on findings from projects funded by the Food and Agriculture Organization of the United Nations, the Dignitas Foundation and the USAID Center for Resilience.

Improving the way we address acute malnutrition in Africa's drylands



Woman and baby, eastern Chad

AFRICA'S DRYLANDS

What we know: High levels of persistent global acute malnutrition (P-GAM) are a problem across the Sahel and Horn of Africa which are typically dryland regions.

What this article adds: An adapted conceptual framework for analysing and addressing acute malnutrition in Africa's drylands has been developed by Tufts University based on research by Tufts and the Food and Agriculture Organisation (FAO), discussed by a wide group of stakeholders during a series of technical webinars and a roundtable meeting in 2020. The framework acknowledges that the immediate and underlying causes of acute malnutrition depicted in the UNICEF conceptual framework remain relevant but proposes three new interlinked basic drivers: environment and seasonality (acknowledging recent research that reveals seasonal peaks in acute malnutrition), systems and formal and informal institutions and livelihoods systems. The vulnerability and resilience of communities and their livelihoods to climate, conflict and other shocks are also explicit. The authors argue that three critical shifts are necessary to address P-GAM in Africa's drylands: a shift in conceptual thinking that emphasises the basic drivers of malnutrition in Africa's drylands, a shift in policy at national level following the lead of the UN Global Action Plan on Child Wasting and a shift in approach that operationalises the adapted framework. This must be underpinned by research and learning on the basic drivers of acute malnutrition using innovative mixed methods and inter-disciplinary approaches with researchers actively engaging with stakeholders to share evidence, learn and build consensus on solutions.

Introduction

Child acute malnutrition is an increasing global public health problem. For some years, nutrition professionals have acknowledged that emergency rates of global acute malnutrition (GAM), a measure of child wasting, are persistently re-occurring, even in the absence of an obvious emergency and despite ongoing interventions (Young and Marshak 2018). Persistent global acute malnutrition (P-GAM) is particularly evident across the Sahel and Horn of Africa, much of which is typically dryland region (Figure 1). More broadly, the 2020 United Nations (UN) Global Action Plan (GAP) on Child Wasting (WHO, FAO et al. 2020) acknowledges this problem and the need to increase efforts to prevent child wasting as part of the Sustainable Development Goals (SDGs).

Since 2017, the Food and Agriculture Organisation (FAO) and Tufts University

have been investigating the problem of acute malnutrition and livelihoods in protracted crises in Sudan, Chad and South Sudan (Young and Marshak, 2019). Building on this earlier research, in 2020 Tufts proposed an adapted framework for analysing and addressing acute malnutrition specific to Africa's drylands. This was presented and further refined through a series of technical webinars in 2020 and a roundtable meeting with the UN GAP agencies and their resource partners.¹

This article reflects on the discussions held during the technical series and roundtable meeting, covering the unique context of Africa's drylands, the three interlinked basic causes of acute malnutrition in this context, the adapted conceptual framework and recommendations for how we can change the way the international community ad-

¹ <https://sites.tufts.edu/malnutritionframework/>

dresses acute malnutrition to better address the problem of P-GAM in this region.

Understanding Africa's drylands

Africa's drylands are characterised by low-lying arid and semi-arid areas inhabited mainly by pastoralist and agro-pastoralist communities whose production systems have evolved to adapt to these harsh environments. Climate variability is extreme, rainfall erratic and seasonal temperatures reach as high as 40 or 50°C.

Africa's drylands are facing multiple challenges. Insecure access to farmland, pastures, water and forest resources is threatening livelihoods that are predominantly based on these same natural resources. Increasing competition and the appropriation of natural resources have led to growing conflicts between resource users which are often overlaid by or interconnected with wider conflicts (inter-tribal, rebel insurgencies, cross border etc.). Population growth, migration and displacement are contributing to rapid demographic and social change, accompanied by increasing livelihood diversification and transformation that often renders women and youth in particular dependent on marginal low return activities. Climate change has been associated with the increasing frequency of drought and floods and increasing temperatures in the Sahel. The institutions that should be able to mitigate these challenges and support livelihoods and good nutrition are often weak and under-resourced. These factors have contributed to the increasing scale of humanitarian

crises in the drylands and unprecedented donor expenditure.

An adapted conceptual framework to understand the drivers of acute malnutrition in Africa's drylands

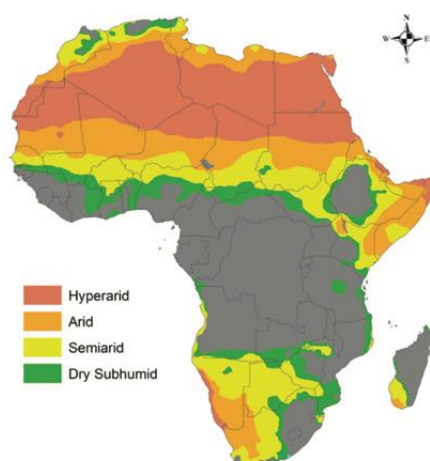
Since the 1990s, there has been broad agreement on a conceptual framework to describe the causes of malnutrition (Figure 2 - left). This framework has three levels: immediate causes, underlying causes and basic causes. Linked with

the causal framework, and specifically the immediate and underlying causes, is a set of technical interventions that have become widely advocated and adopted over the past 20 years (Bhutta, Das et al., 2013).

Inadequate food intake and disease are the direct causes of child acute malnutrition which, in turn, are driven by factors related to food, health and care at household and community levels. Implicit in this downstream focus on the immediate and underlying causes of malnutrition is the assumption that part of the solution to

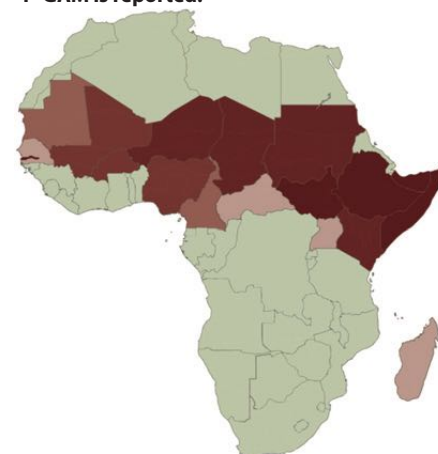
Figure 1 Comparison between Africa dryland areas and countries in East Africa and the Sahel where P-GAM is reported

a. Africa Dryland Areas.



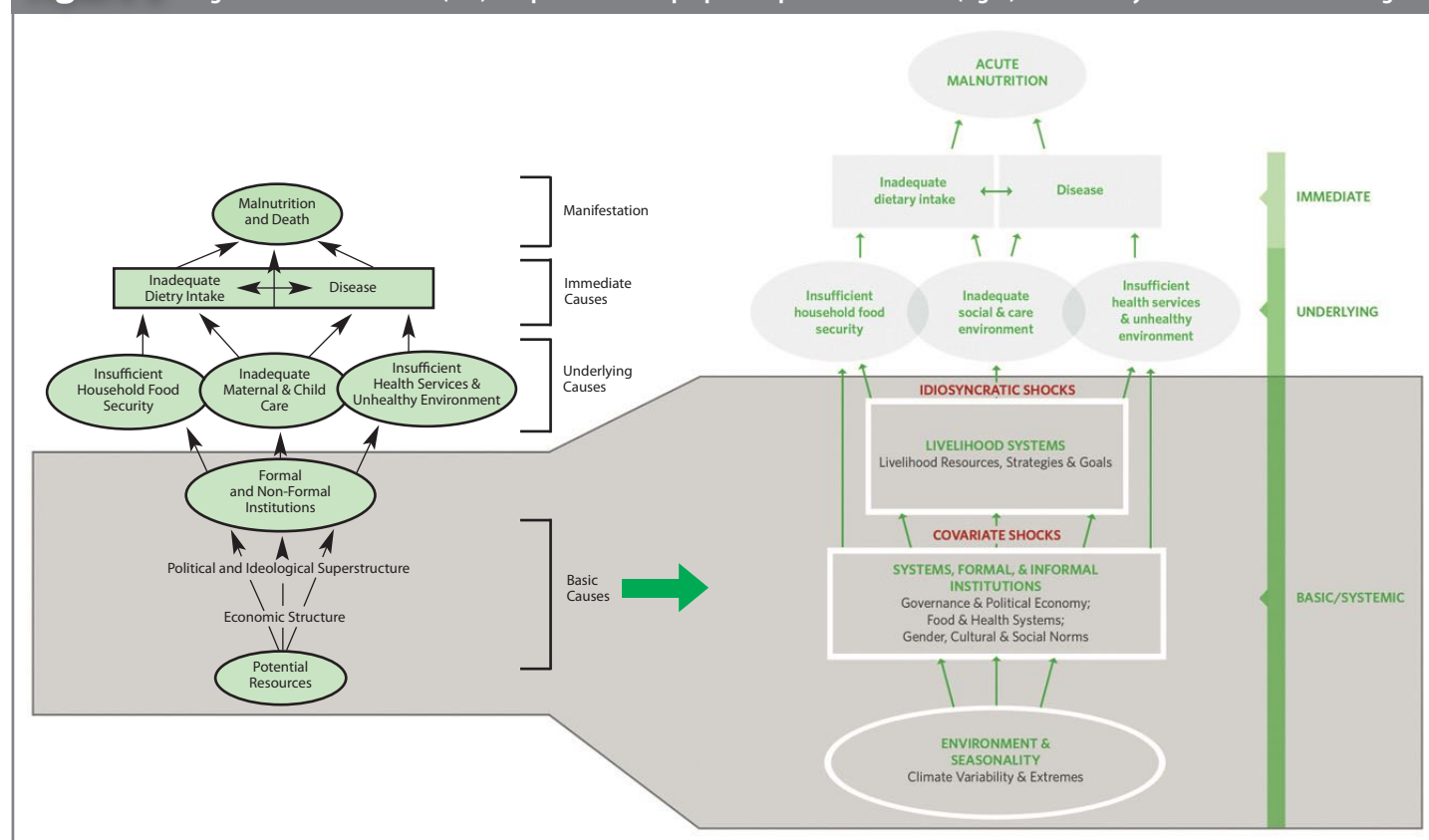
Source: Sorensen, 2007

b. Countries in East Africa and the Sahel where P-GAM is reported.



Source: Young and Marshak, 2018

Figure 2 Original UNICEF framework (left) compared with the proposed updated framework (right) in which only the basic causes are changed



child acute malnutrition lies within the agency of communities and households. However, it is critical that we also look upstream to the basic drivers to better understand the social and economic systems and institutions that have such powerful influences on acute malnutrition and its proximal causes. A failure to give attention to these more structural, basic drivers of acute malnutrition accounts for the persistence of acute malnutrition (Gillespie, Haddad et al., 2013; Brown, Backer et al., 2020). If we are to develop more effective approaches to effectively prevent acute malnutrition, it is critical that we co-develop our understanding of these basic drivers and how they work.

The adapted conceptual framework (Figure 2 - right) acknowledges that the immediate and underlying causes remain relevant but proposes a new framework for understanding the basic drivers of acute malnutrition, drawn from the evolving body of knowledge and experience in relation to disaster vulnerability, dryland environments, livelihood systems and resilience. Building on the original framework, the revised version conceptualises the following three interlinked basic drivers: environment and seasonality, systems and formal and informal institutions and livelihood systems. The vulnerability and resilience of communities and their livelihoods to climate, conflict and other shocks are also explicit.

Understanding the three basic drivers of acute malnutrition

Environment and seasonality

Environment and seasonality are underpinned by our understanding of dryland systems as ecosystems with particular characteristics. Dryland regions are characterised by extreme variability in rainfall and vegetation in space and time. So, although there are predictable seasons, there is wide variability from year to year and between nearby areas. For example, when the rains start, where the rain falls and the duration and intensity of the showers varies widely which means the availability of water and pastures is to some extent unpredictable as is the crop growth cycle.

The FAO and Tufts research reveals the importance of seasonality in relation to dryland livelihoods. A re-analysis of 350 surveys from Chad, Sudan and South Sudan found two seasonal peaks in acute malnutrition: the first and larger peak at the end of the hot dry season, as the rains start, and the second peak coinciding with the end of the rains and the beginning of the harvest season (Figure 3).

Additional Tufts' work has confirmed the relationship between these climatic variables and multiple yearly seasonal peaks in acute malnutrition using both primary data collection in Chad as well as 15 years of secondary data across all unimodal dryland contexts in Africa (Marshak, Venkat et al., 2021).

In 2014, the World Health Organization (WHO), UNICEF and the World Food Programme (WFP) recommended developing "a

better understanding of the major causal factors of wasting, including seasonal patterns" (WHO/UNICEF/WFP, 2014). They emphasised the importance of prevention strategies leading up to the lean/hungry periods and the scaling up of treatment services in response to seasonal "surges" of acute malnutrition. Yet, as the FAO/Tufts research on seasonality shows, the timing of seasonal peaks may differ markedly from that which is widely assumed, underlining the urgent need for evidence to support sustainable and appropriately timed solutions for the prevention of acute malnutrition.

Systems and institutions

Systems and institutions determine how things work and influence people's access to resources. Systems include governance, political and economic systems, food systems, public health systems and livelihood systems. Formal and informal institutions are embedded within systems and reflect agreed ways of working or living together. Formal institutions include policies and formal rules and regulations, such as the regulations governing the quality of the food supply.

Informal institutions reflect widespread and persistent patterns of behaviour and practices that are structured by the norms and values of society. For example, deeply held gendered social norms shape the roles and responsibilities of women, men, girls and boys at household and community level, including access to and control over resources and participation in decision-making in community affairs and politics. The voices and concerns of women, youth and other marginalised groups are often excluded from local decision-making fora. These social determinants of power and control have a powerful influence on the nutrition of children and women.

The climate and conflict shocks that drive acute malnutrition, as well as the social and economic inequities that drive the underlying causes of acute malnutrition, can be potentially mitigated (or exacerbated) by deeper structural and institutional processes. For this reason, a lasting and sustainable impact on acute malnutrition can only be sustained through systemic and institutional change that reduces inequities and positively influences access to the wide-ranging resources necessary for sustaining liveli-

hoods (including human, social, natural, economic and physical resources).

Livelihood systems

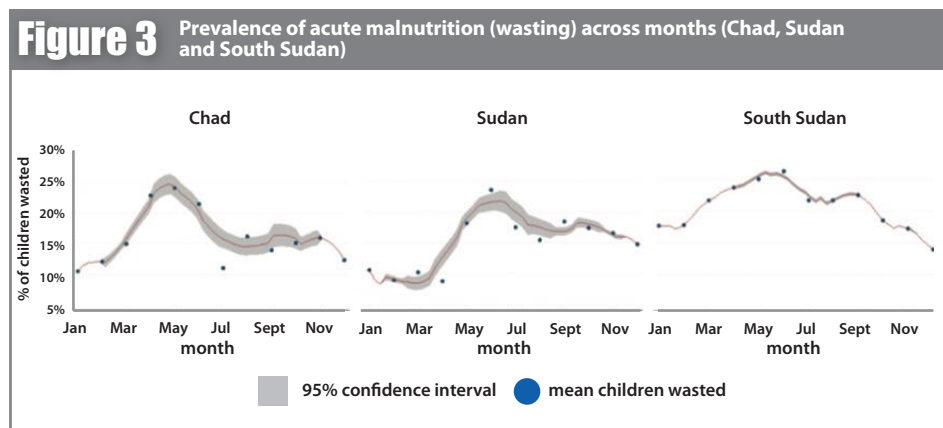
The predominant livelihoods in drylands are pastoralism, agro-pastoralism and farming which have long since adapted to the environmental variability affecting the distribution of water, pasture, forest and crops. Dryland producers are expert in managing this variability, knowing where the best conditions can be found for herds or for farming at different times of the year (Krätli, 2015). This specialised livelihood adaptation accounts for the inherent resilience of pastoralism. However, the ways in which dryland producers manage risk are not always well understood and can be inadvertently undermined by inappropriate policies or programmes.

Worsening conditions linked to shocks, combined with poor governance, have undermined livelihood resilience and prompted coping strategies that have led to the transformation of livelihoods, often to the disadvantage of women who bear most responsibility for the nutrition of children.

Attention to livelihoods sharpens the focus on household priorities and local agency – two factors which are often missed by remote programming or ignored by top-down aid delivery approaches. By incorporating livelihood systems and institutions as part of the malnutrition causality framework, recognition is given to inequalities in access to all forms of resources (not only wealth), as well as the importance of wider forms of institutional agency and power that maintain inequalities or marginalise certain groups (as in structural racism).

Developing a new approach to addressing acute malnutrition in drylands

The 2020 UN GAP framework calls for radically improved solutions and "a crucial policy shift" towards prevention and a more sustainable systems-wide approach. The framework is intended to facilitate countries that are most affected by acute malnutrition to develop their own operational roadmaps with "context-specific commitments, targets and actions to accelerate progress and contribute to reaching the global SDG targets" (WHO et al, 2020). The Tufts/FAO



Source: (Young and Marshak, 2019)

technical series concluded that three critical shifts are necessary to address P-GAM to make this happen:

1. A shift in conceptual thinking that emphasises the basic drivers of malnutrition that are specific to Africa's drylands

Addressing P-GAM in Africa's drylands is a very specific and pressing problem that can no longer be seen as an aberration linked to humanitarian emergencies. It is now well proven that unacceptably high levels of acute malnutrition have persisted over years, if not decades, in many countries. The scale and severity of this problem justifies further analysis of its long-term trends and drivers, in particular the basic drivers. This must start with an appreciation of environmental variability and seasonality and the way this is managed on the one hand by the prevailing formal and informal institutions and on the other by dryland producers whose livelihoods are fundamentally adapted to these harsh dryland conditions. In addition, the resilience of dryland livelihood systems has been undermined by multiple processes and institutions such as centralised decision-making that ignores local priorities, regulations that restrict herd mobility and processes of land privatisation that limit women's access to cultivable land or access to water. A new conceptual framework, as presented in Figure 2 - right, will support the generation of new evidence to inform more effective strategies.

2. A shift in policy at national level following the lead of the 2020 UN GAP

The UN GAP on Child Wasting recognises the limitations of technical fixes or interventions and emphasises instead the need for systemic and institutional change, for example strengthening systems that can contribute to improved food, health and social systems. This recognition of the limitations of current approaches is a transformation in public policy and requires systemic change at every level of public office for real change to happen. Concurrent policy changes are needed across multiple sectors at all relevant levels to ensure a conducive policy environment to effect change.

3. A shift in approach that operationalises the adapted framework

While there has been considerable progress on the shift in conceptual thinking and international policy shifts, the greatest challenge lies in developing and operationalising a new approach in a specific context. The UN GAP on Child Wasting advocates promoting government leadership committed to building their own multi-stakeholder consensus to achieve the necessary systemic changes and impacts at the local level. Government commitments and ownership of prevention strategies should be evident in their operational roadmaps.

Developing these roadmaps must include demand-led, applied research to understand the drivers of acute malnutrition, including the basic drivers, as well as monitoring systems for

capturing long term trends in acute malnutrition and confirming seasonal patterns of malnutrition and its drivers. Without solid evidence, countries will face challenges building a stakeholder consensus regarding the specific seasonal drivers and the most cost-effective and sustainable approaches to addressing these.

Attention to systemic and institutional approaches requires commitments and buy-in from a diverse cast of players. Such commitments cannot be assumed and neither can the identities of the key players or stakeholders. Studies must identify key stakeholders at all operational levels, starting at the local level in order to comprehend local perspectives, knowledge and understanding as well as their capacities and ongoing commitments. Key stakeholders will include a range of governance and non-state institutions with local institutions that influence people's lives and livelihoods being particularly important.

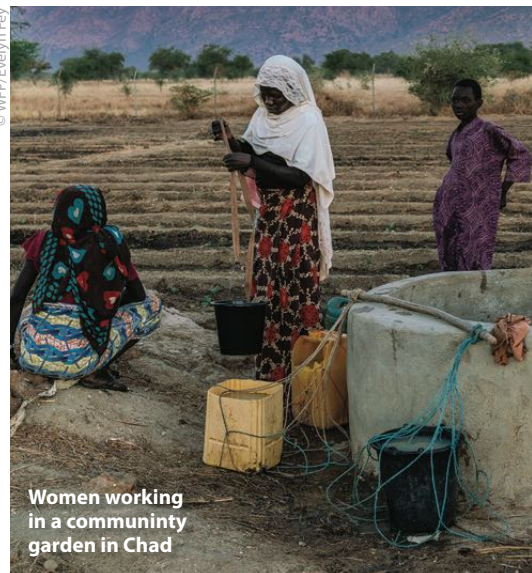
Research and learning should underpin new approaches. While impact studies will always have a role to play, researching the basic drivers of acute malnutrition requires innovative mixed methods and inter-disciplinary approaches.

A proper stakeholder analysis combined with an analysis of P-GAM trends, potential hotspots and drivers and seasonal patterns in those drivers and nutrition outcomes can provide an excellent starting point for developing such an operational roadmap and designing evidence-based strategies to prevent malnutrition. Given the potential complexity of this task, it should be approached as a capacity-building exercise ensuring the active participation of key stakeholders in the analysis and in developing the roadmaps. Fortunately, research and learning provide an excellent basis for collaboration, capacity-building and developing local leadership and ownership of evidence.

Conclusion

Much was learned during the technical webinar series and roundtable discussion from the wide audience participation, inputs from panellists and moderators and also from the UN represen-

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Women working in a community garden in Chad

tatives and resource partners. Particularly striking was the acknowledgement at the highest level that business as usual is not working. As one senior commentator remarked, "*the historical emergency/humanitarian entry point into wasting has resulted in an overemphasis on services and programmes, rather than on systems, national networks and institutions*". At the same time, panellists spoke authoritatively about the basic systemic drivers, how they play out and how they might be addressed in a more sustainable way. Through these discussions, it became clear that there is no blueprint for multi-systemic strategies and response. This means that researchers cannot simply write research papers and interact mostly with other researchers. We must continue the positive shift towards 'engaged scholarship' in which scholars and researchers actively seek out stakeholders, share evidence, listen and learn and together promote collaborative learning and consensus building regarding systemic solutions to acute malnutrition. While there is much more work to be done, this marks a significant shift in approach that we aim to continue as we work toward operationalising the adapted framework.

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A nutrition camp, Mahatma Gandhi Seva Ashram, 2019

Multi-sector nutrition programming: 'Nutrition Smart Villages' in Bangladesh and India

By Sweta Banerjee



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This project was conducted with funding from the German Federal Ministry for Economic Cooperation and Development. The author would like to thank the project staff and management of Welthungerhilfe India, Bangladesh and Nepal. The involvement of the following partners was also critical in achieving results: in India, Mahatma Gandhi Seva Ashram, Darshana Mahila Kalyan Samity, Vikash Sambad Sanstha, in Nepal, FORWARD Nepal and Aasaman Nepal and in Bangladesh, Anando and Friends in Village Development Bangladesh (FIVDB).

INDIA & BANGLADESH

What we know: High rates of undernutrition exist among infants, young children and women of reproductive age in India and Bangladesh.

What this article adds: Nutrition Smart Villages – a multi-sector nutrition-sensitive approach to address the multiple causes of undernutrition by supporting communities to plan and implement activities and access government entitlements to improve agricultural, water, sanitation and hygiene (WASH), nutrition and care practices – was implemented in 200 target villages in India and Bangladesh over 24 months. The results of the baseline and endline surveys in 50% of the project villages showed marked improvement in women's and children's dietary diversity and improvement in WASH practices. However, few gains were made in the reduction of child wasting, particularly in India. This may be due to the heavy workload of women in India compared to Bangladesh, low dietary protein and also a long dry season during which dietary diversity could not be maintained. Key lessons learned are the need for a multi-sector approach to create an enabling environment for behaviour change, the need to integrate programming into existing institutions and government services and the need to strengthen government systems and find ways to overcome capacity gaps. The next phase of the project will focus on context-specific actions to sustain and improve the gains made for scale-up through the government.

Background

Undernutrition among women of reproductive age is a major public health problem in India and Bangladesh. In both countries, the prevalence of anaemia is high among pregnant women, at 40% and 41% in India and Bangladesh respectively (Development Initiatives, 2020). Undernutrition before and during pregnancy puts women and their offspring at risk of adverse health outcomes and transfers the risk of undernutrition to the next generation. Levels of childhood undernutrition are also extremely high; in India and Bangladesh respectively, only an estimated 16.4% and 26.6% of children aged 6-23 months achieve minimum dietary diversity, 38% and 30.8% of children are stunted and 21% and 8.4% of children are wasted (Development Initiatives, 2020).

Poor water, sanitation and hygiene (WASH) practices are a major risk factor for undernutrition and negative health outcomes in both countries. According to the latest National Family Health Survey, 51% of households in India have no improved sanitation facilities (94% among the poorest households) and less than 50% of the population have access to safely managed drinking water (IIPS & ICF, 2017). In Bangladesh, open defecation reduced from 17.68% in 2000 to 0.27% in 2016, however, by 2016 only 47% of households had access to basic sanitation facilities (WHO/UNICEF, 2017).

The loss of crop diversity in South Asia is considered a major environmental and health concern. Traditional seeds are being replaced by high yielding/hybrid varieties and farmers are increasingly using monocropping (growing a single crop year after year on the same land)

for increased cash income. The impact of climate change has led to an increase in extreme weather events including floods, cyclones, drought and heat spells which compound the challenges experienced by smallholder farmers and lead to increased food and nutrition insecurity. It is predicted that the collective economy of South Asian countries could lose 1.8% of its annual Gross Domestic Product by 2050, rising to 8.8% by 2100 as a result of the impacts of climate change (Ahmed & Suphachalasai, 2014).

This article describes a multi-sector approach used in rural villages in Bangladesh and India by Welthungerhilfe (WHH) and partners that aims to address the multiple causes of undernutrition by improving agricultural, WASH, nutrition and care practices using a holistic, community-led approach. The Nutrition Smart Villages project was carried out for 24 months in target villages in India and Bangladesh from September 2018 to August 2020. The results of the baseline and endline surveys are presented along with lessons learned.

Programme description

WHH first started applying a multi-sector approach in 2011 in the context of a long-term, rights-based programme, the 'Fight Hunger First Initiative'. This initiative was designed through a consultative process with 10 Indian partners with a vision to develop a long term, low-cost project that would engage multiple stakeholders and that could be scaled up through government systems. The project aimed to attract long term financing from donors in order to implement the concept and generate evidence of its impact. To date, 15 partners across three countries (Bangladesh, India and



Self-help group members preparing nutri-mix, Mahatma Gandhi Seva Ashram, 2020

Nepal) have tested this multi-sector approach which has now evolved into the 'Nutrition Smart Villages' concept.

The Nutrition Smart Villages approach helps communities to understand nutrition in practical terms and plan their agriculture practices, natural resource management, entitlements and livelihoods according to the nutrition needs of the family, particularly focusing on the nutrition needs of children and women of reproductive age (15-49 years). The project also aims to demonstrate to local government how existing government schemes in India and Bangladesh can be converged at household level to target support to its members that are most vulnerable to undernutrition. The hypothesis is that if families understand their nutrition situation and needs, have control over their own resources and are empowered enough to create a demand for their entitlements, then their members will be able to achieve optimal nutrition. The increased demand for services is in turn expected to stimulate adequate service supply thereby creating an enabling environment for good nutrition.

In India and Bangladesh, the Nutrition Smart Villages project is currently implemented in 100 villages in two districts of Madhya Pradesh in central India (Chhatarpur and Sheopur) and 100 villages in three districts of Bangladesh (Netrokona, Sirajganj and the Chittagong Hill Tracts). Districts and villages were targeted based on social and geographical exclusion, landlessness and other social vulnerabilities. The government schemes of primary interest to the project are the *Poshan Abhiyan* in India and the National Plan of Action for Nutrition under the Bangladesh National Nutrition Commission in Bangladesh. Links are also made in both countries with government departments of livelihoods and rural development, food and supplies, agriculture, horticulture, fisheries, animal husbandry and WASH, all accessed through the local administration. Strong links are also made with village assemblies for village planning and budgeting.

WHH's India and Bangladesh offices implement the programme of work through local non-governmental organisations (NGOs) with support from WHH in the form of capacity building on project and financial management, skills development around implementation activities and project monitoring and evaluation. The programme requires minimal infrastructure support and focuses on skills and capacity building. Interventions carried out by the NGOs are described as follows.

Village-level interventions

In each Nutrition Smart Village, five evidence-based interventions are implemented in partnership with community and grassroots service providers.

Linking agriculture and natural resource management towards nutrition security

Linking agriculture and natural resource management towards nutrition security (LANN+) meetings are held within the villages, through which community members learn about agricultural practices and natural resource management to support nutrition as well as diet, childcare and WASH practices. Local service providers along with volunteers from local committee/self-help groups (SHGs)¹ use Participatory Learning for Action² techniques to deliver the sessions over a period of 12 to 15 months.

Sustainable integrated farming systems

Sustainable integrated farming systems, including nutrition gardens, are important agroecology-based interventions that enable households to use all the available resources including uplands, degraded land and fallow land to produce food for their own consumption. Every family is encouraged to develop their own nutrition garden to produce seasonal vegetables, legumes, roots/tubers, spices and fruits. Gardens are integrated with crops, trees, fisheries, aquatic birds and livestock so that all the resources are optimally used to increase diet diversity. Hunger periods are reduced through the promotion of millets and the use of root intensification, farm bunds, multi-layer farming and mixed cropping among

other sustainable agriculture techniques. Reduced dependence on markets for staples and pulses during lean periods enhances the capacity of families to buy fruits, vegetables and animal products to increase household dietary diversity. Food preservation and storage is included in farm planning as well. This farming system also supports the use and protection of natural resources in the local environment and the use of uncultivated foods.

Nutrition-sensitive micro planning

Elected village members are trained in nutrition-sensitive micro planning skills after which they work with villages to develop plans that focus on the needs of families with undernourished women and children. These members support households to develop their own resource plans to maximise food production, income and sanitation facilities using existing resources. They also work at village-level to develop village plans, mandated by government and linked to village development budgets, which are a compilation of the household plans submitted to the village assembly for approval.

Nutrition behaviour change campaigns

Campaigns are designed to support families, especially mothers with undernourished children, to adopt care practices that support good nutrition. The government service providers, along with volunteers and SHG members, are trained to measure height, weight and mid-upper arm circumference. Children aged 6-36 months are weighed and height/length is measured in each village to identify undernourished children. Caregivers of children identified as undernourished receive counselling on infant and young child feeding, hygiene and care practices. This initiative is further strengthened through promotional activities and low-cost interventions such as nutrition gardens, hand washing stations, water filters and waste management. Under this activity, 15-day positive deviance camps are facilitated for the mothers/caregivers of children identified as undernourished through which they receive demonstrations of care practices, the making of low-cost nutritious food recipes, nutrition gardening (including composition, preparation of bio-pesticide and seed preservation) and preservation of foods for lean periods.

Strengthening institutions

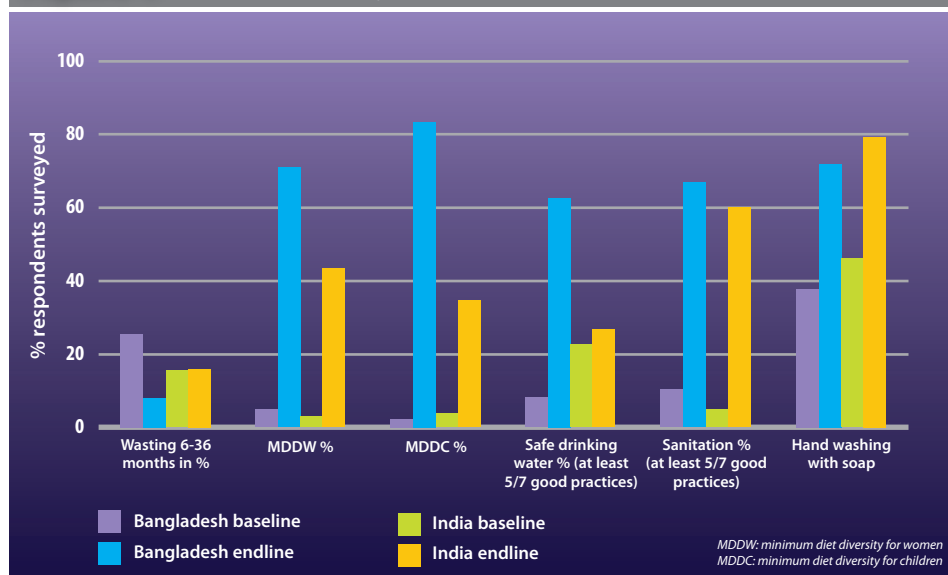
Existing village institutions, SHGs and local committees within the village are strengthened by project facilitators to understand government entitlements and how to access them. By informing, up-skilling and motivating these village-level institutions, government service providers are held accountable and villagers gain access to all the services that they are entitled to.

¹ SHG – Self-help groups (SHGs) are informal associations of people who choose to come together to find ways to improve their living conditions.

² Participatory Learning for Action is a family of approaches, methods, attitudes, behaviours and relationships that enable and empower people to share, analyse and enhance their knowledge of their life and conditions and to plan, act, monitor, evaluate and reflect.

Table 1 Sample households survey

Country	Number of project villages	Total population from project villages	Number of households	Number of children 6-36 months	Number of villages in the sample	Number of households surveyed
Bangladesh	100 (3 districts)	110,000	21,529	5,622	60	559
India	100 (2 districts)	112,084	22,091	6,284	50	627
Total	200	222,084	43,620	11,906	110	1,186

Figure 1 Baseline (2019) versus endline (2020) findings of the Nutrition Smart Villages project in India and Bangladesh**Table 2** Numbers and percentages of wasted children in target villages at baseline (2019) and endline (2020)

	Baseline	Endline	Baseline	Endline
Severe wasting (≤ -3 WHZ)	23 (3%)	31 (4%)	68 (12%)	0 (0%)
Moderate wasting (≤ -2 and ≥ -3 WHZ)	99 (15%)	150 (18%)	82 (15%)	80 (14%)
Total	122 (18%)	181 (22%)	150 (27%)	80 (14%)

Members of the village institutions are also engaged as volunteers for the LANN+ sessions, nutrition awareness, village micro planning and integrated farming to ensure project sustainability.

Meso- and macro-level interventions

Activities also take place at the meso- and macro-level through local NGOs supported by WHH. Partner NGOs develop knowledge management platforms to facilitate exchange between communities and policymakers. They also work to build the capacity of elected representatives at gram panchayat/ward/municipality levels on nutrition-sensitive village micro planning and understanding government schemes and budgets. Platforms are also created at state and national level to facilitate networking between partner organisations and to lobby government on policy development and citizen rights at national level for local-level support. To support these activities, WHH has developed manuals, training videos and information, education and communication materials to support the training of community and service providers in scaling up services to new villages.³

Results of baseline and endline surveys

After 24 months of implementation, the project aimed to achieve a 15% reduction in wasting (measured by weight-for-height z-score) for children aged 6-36 months, a 30% improvement in the number of women of reproductive age attaining minimum diet diversity for women, a 40% improvement in children aged 6-23 months in target households attaining a minimum adequate diet and a 60% improvement in target households improving WASH practices.

To measure success, a baseline survey was carried out prior to implementation, from April to May 2019, followed by an endline survey after 12 months, carried out in May to June 2020. For the baseline survey, a sample of 10% of households with children aged 6-36 months was selected. Due to budget limitations, the survey was restricted to 50% of the project villages and random sampling was used to identify the 110 villages. Clusters from each of these villages were selected using ENA software

and households with children aged 6-36 months were selected randomly. A total of 1,186 households were surveyed across both countries (Table 1). The survey was repeated at endline to measure change in key indicators.

Findings

Figure 1 presents the baseline and endline findings for each of the indicators outlined as project targets.

Child nutrition status

Results show that in Bangladesh the levels of child wasting in Nutrition Smart Villages were reduced during the project period, particularly severe wasting which reduced to zero. However, the number of cases in India did not improve and in fact rose slightly (Table 2). Underweight data was also collected but has not been shared here given the short time frame between baseline and endline surveys; these results will be reported at the end of the next phase of the project.

Women's diet diversity

The overall minimum diet diversity of women in the project villages improved dramatically in both countries. More than half of the target women were found to be consuming five or more food groups at endline compared to only 3% in India and 5% in Bangladesh at baseline. Although Bangladesh villages had a higher percentage of women consuming five or more food groups compared to India, both countries achieved over the target of 30% improvement in spite of the nutrition gardens being less successful in the Indian villages. Findings also show that own production as a source for cereals increased substantially; only 16% of respondents reported purchasing cereals from the market across all locations compared to almost 70% at the time of baseline. Respondents also reported increased consumption of animal products among those women farming animals including hens, goats and fish.

Children's diet diversity

The proportion of children consuming four or more food groups increased from 4% at baseline to 41% at endline in India and 2% to 100% in Bangladesh. Children aged 9-23 months of age also showed 100% achievement in minimum meal frequency in Bangladesh but only a 9% increase from baseline in India in the same age group, and meal frequency in children aged 6-8 months actually decreased in India (15% at baseline compared to 7% at endline). The lack of increase in meal frequency in India may be as a result of strong social taboos and myths around complementary feeding. In addition, twice as many women from agrarian families are engaged in the agriculture sector in India than in Bangladesh, so the feeding of young children is often taken care of by older siblings or grandparents. Efforts are being made to popularise homemade instant mixes which are high in protein, carbohydrates and micronutrients to help to boost the nutrient intake of young children.

³ <https://welthungerhilfeindia.org/publications/>

WASH behaviours

Access to safe drinking water has improved. In India, larger numbers of families now access private and public taps for drinking water (from 16% at baseline to 57% at endline). In Bangladesh, where the primary source of drinking water is handpumps, access to safe drinking water has increased from 42% to 89%. Hand washing knowledge and practices improved at household level from baseline to endline in both countries. Every household in Bangladesh has now installed an improvised tippy tap.⁴ In India, tippy taps have been installed at service delivery points but they are yet to take off at household level. Some households have been provided with hand washing stations but, due to scarcity of water knowledge, this has not translated into practice in terms of hand washing to the expected degree (nearly all respondents reported washing their hands after using the toilet but not at other key times such as after handling animals or before eating and preparing food). Positive change was seen in the use of toilets among households who already had toilets but were not previously using them.

Discussion

Over the course of one year, substantial gains were seen in project areas in both India and Bangladesh in terms of improved dietary diversity of women and children as well as in the adoption of improved WASH practices. There was some decline in levels of child wasting in project villages in Bangladesh but no improvement (and in fact a slight increase) in levels in India. The lack of expected change in child nutrition status may be as a result of the short implementation period (11 months). Poorer outcomes in India compared to Bangladesh may be driven by the fact that women in Central India are heavily engaged in agriculture, wage labour, migration and fetching water (more so than in Bangladesh) and therefore have less time for childcare which may compromise infant feeding practices. Variations in dietary practices between the two countries may be another cause; in India, the

main protein sources are pulses and milk, compared to fish, eggs and chicken in Bangladesh. Project areas in Central India also have a very long dry spell during which water is scarce which affected the ability of many households to support dietary diversity throughout the year (in between the baseline and endline studies). A major limitation of these findings is that there was no control group; changes therefore cannot be definitely attributed to the project. That said, the impact on the quality of life of the project participants was readily observed by partners and has resulted in attention from governments and development agencies.

An important lesson learned from this programme is that increased knowledge can only translate into new behaviours in the context of an enabling environment including access to water, livelihood opportunities within the village, access to markets, improved infrastructure and the improved delivery of government services and good governance. To be successful, multi-sector programmes must be designed to integrate into existing community-level institutions and link to existing government schemes. This is what makes the programme scalable. The limitations of local government institutions in countries such as India and Bangladesh are a major impediment to sustainable change, in particular the lack of staff at grassroots level provides a major constraint to realising full government services. Strengthening local institutions and financially supporting volunteers were found in this context to be a suitable stopgap. Financial models are being explored to sustain this in the long term, such as service charges for volunteers paid by the community. The collection of data is also important to enable proper monitoring of progress. Data collection should focus not only on inputs and outputs but also results, for example, not just on whether toilets are constructed but the levels of open defecation, or not just on the development of nutrition gardens but on the consumption of vegetables year-round.

These are still early days in the project. Funding from the German Federal Ministry for Economic Cooperation and Development has enabled the project to be extended for an additional three years. Activities at village-level are ongoing with a focus now on sustaining new behaviours and achieving the 'last mile' in project villages before partners gradually phase out. This will take time and will require a continued multi-sector approach that is refined for the specific context of each country. In India, the focus will be on reducing women's engagement in work outside the household and on home-based income-generating activities, as well as building skills to ensure sustainable dietary diversity and increased meal frequency for children. In Bangladesh, the focus will be on scaling up the programme through government systems. The creation of knowledge management platforms for experience sharing and the exchange of tools to minimise duplication and save time during scale-up of the Nutrition Smart Villages model is another focus area of the second phase, as well as the piloting of a mobile-based data collection and management system in Bangladesh that will share information with government institutions.

Further afield, evidence from this programme is being used to inform the implementation of the same model in other countries with high burdens of undernutrition. During this next phase, WHH is supporting implementation and scale up in Tajikistan, Afghanistan, Pakistan and Myanmar. Virtual workshops and 'South to South' exchange programmes are planned to support this effort as well as joint conferences with the SAARC agriculture centre⁵ in Dhaka involving representatives from all seven countries. Learnings will continue to be captured and shared.

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Matka filter distribution, Darshana Mahila Kalyan Samity, 2019

⁴ **Tippy Tap** is a hands-free device for hand washing that is specially designed for rural areas where there is no running water. It is operated by a foot lever and thus reduces the chance for the transmission of pathogens, as the user only touches a bar of soap suspended by a string.

⁵ SAARC Agriculture Centre is a South Asian Association for Regional Cooperation agency responsible for promoting Research and Development in agriculture in South Asian countries.

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In Chad, the Mother-MUAC approach improves treatment access for malnourished children

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Practice session for MUAC measurement by MUAC mothers in the Mahamata area of Chad

CHAD

What we know: Screening for malnutrition is increasingly conducted by family members as a means of enabling broader and earlier detection of child malnutrition.

What this article adds: In 2018, the non-governmental organisation, Première Urgence Internationale, introduced the 'Mother-MUAC approach' into its nutrition programme in the Ouaddaï province of Chad. Screening coverage increased from 79.6% when using the previous approach (screening conducted by community health workers (CHWs)) to 85.5% (screening conducted by family members). An increased percentage of children diagnosed with severe wasting were also admitted for treatment at a health facility (63.2% in the Mother-MUAC approach versus 50.2% in the CHW approach). Therapeutic treatment performance indicators were comparable between both strategies. Results also demonstrated strong acceptance by mothers of the Mother-MUAC approach, both by mothers doing the screening and by mothers whose children were screened by mother-peers. Health staff are also highly supportive of the approach due to the improved programme coverage and the cooperation of caregivers. In addition, the programme support costs were reduced by 27% according to average support cost per health centre. In this programme, the Mother-MUAC approach has proven effective in facilitating diagnosis and accelerating the management of children in situations of concern.

Background

Ouaddaï province is located in Eastern Chad on the border with Sudan. It is subject to strong climate fluctuations, rapid desertification, soil erosion and reduced land productivity¹ as well as inter-community conflicts leading to internal population displacements. Chad also hosts over 300,000 refugees from Sudan in camps in the Eastern provinces.² Climatic conditions and migratory flows put great pressure on already weak natural food and financial resources in the Ouaddaï province, as well as on response capacities for the provision of basic social services.

The infant and child mortality rate in Chad is 113 deaths per 1,000 live births which means that one child in ten dies before reaching the age of five years. Leading causes of death are malaria (20.4%), pneumonia (15.7%) or diar-

rhoea (13.5%)³ with malnutrition being a major contributing factor. In Ouaddaï province in 2018, the prevalence of global acute malnutrition (GAM) was 17.8% and 5.1% for severe acute malnutrition (SAM) (Republic of Chad Ministry of Public Health, 2019). Nutrition interventions in the province therefore have a crucial role to play in ensuring child survival and growth. In its National Nutrition and Food Policy (Republic of Chad, 2013), the Chadian government put in place strategies to improve the nutritional situation including prevention activities and the adequate management of acute malnutrition. The treatment of SAM cases with medical complications is carried out in therapeutic feeding centres (TFC) in district hospitals while cases without

¹ Climate vulnerability index <https://www.maplecroft.com/>

² www.unhcr.org

³ <https://data.unicef.org/country/tcd/>



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complications are treated at the community level in outpatient therapeutic programmes (OTP) attached to Health Centres (HCs).

In 2016, the non-governmental organisation (NGO), Première Urgence Internationale (PUI), began implementing a project to prevent and treat SAM in children under five years of age and pregnant and lactating mothers in Ouaddaï province. In recent years, PUI has identified the need to improve the quality of nutritional care by, among other things, improving the quality and coverage of screening for malnutrition in the community and the referral of children identified for treatment. The 'Mother-MUAC' approach involves mothers screening their own children for signs of acute malnutrition using mid-upper arm circumference (MUAC) tapes. The effectiveness of this approach has been demonstrated in Niger (Blackwell et al, 2015) and has been successfully tested in Chad by several NGOs⁴ as a means of enabling broader and earlier detection of child malnutrition. PUI began incorporating Mother-MUAC within its wasting treatment and prevention programme in Ouaddaï province in 2018, adapting it to the programme realities of the context. This article describes that process, the results and the lessons learnt.

Implementation of the Mother-MUAC approach in Ouaddaï province

PUI has been implementing a SAM prevention and treatment programme in an area covered by 24 HCs in the health districts of Adré (11 out of 22 HCs), Abougoudam (four out of 11 HCs) and Abéché (nine out of 30 HCs) in Ouaddaï province since 2016. The decision to provide support to these three health districts was based on a request from the national authorities who had noted that the management of malnutrition was insufficient due to the lack of support from a technical and financial partner. The services of PUI were recruited to improve the quality of existing SAM management services and set up new services where they did not already exist.

Until May 2018, community screenings and referrals of malnourished children aged 6-59

months were carried out by Community Relays (in French, ReCo) – community health agents supervised by the team of around four community health workers (CHWs) from each HC. By this time, PUI had recruited and trained 370 ReCos and 152 CHWs across the three health districts. The ReCos were assigned to a group of villages to carry out malnutrition screening. These screenings were expensive because ReCos and CHWs were paid, with additional bonuses paid on condition of results (number of children screened for malnutrition, proper reporting done, community sensitisation carried out).

From May 2018, several adaptations were made to the programme in response to reduced funding. Firstly, the number of targeted HCs was reduced by three – from 24 to 21. The three HCs with the best performance criteria (programme coverage, quality of care, etc.) were selected for reduction in support services to minimise any negative impacts. In addition, Mother-MUAC screening was introduced as a more financially sustainable form of community screening as well as to support the more rapid identification and referral of children with acute malnutrition for treatment, thereby reducing the complications and mortality associated with late treatment.

In this approach, mothers were trained to identify acute malnutrition, either by using a coloured tape to measure MUAC or by detecting oedema. Mothers were trained to screen their own children as well as other children from within their neighbourhood or village. This is different to the common application of the Mother-MUAC approach whereby each mother only screens her own child. PUI chose to adapt this and train mothers to screen around 12 children aged 6-59 months each, including their own children and others in their village, all in a voluntary, unpaid capacity.

Process for introducing the Mother-MUAC approach

The process of moving from the ReCo screening to Mother-MUAC was implemented over a two-month period in June and July 2018. The main steps in this process are described below.

Informing and mobilising the community around the approach

PUI, together with the District Executive Teams, discussed the approach with HC managers (responsables des centres de santé, RCS), health centre management committees (comités de gestion des centres de santé, COGES) and health committees (comités de santé, COSAN) in each zone to obtain their approval so that they could then sensitise the community on the value of the early detection of acute malnutrition and the role of mothers in the prevention of malnutrition.

Identification of beneficiary villages

In collaboration with community leaders, the RCS, COSAN/COGES and functional women groups in the villages, 759 villages were identified to be part of the programme's coverage area. A total of 201 out of 960 (21%) were excluded as they were small or very small villages. Those comprised a large number of ferricks, villages with only a few households, and nomadic non-permanent settlements.

Identification of the mothers

In order to reach as many mothers as possible, several criteria guided the identification of Mother-MUACs. To become a Mother-MUAC, volunteers were asked to be available and active in their community, be of childbearing age, be accepted by the community, have resided in the village for at least one year and accept doing the screening activity on a voluntary basis.

Training and awareness

In July 2018, mothers were trained on the use of the MUAC tape to screen for malnutrition (MUAC measurement), identification of oedema, effective infant and young child feeding practices and how to refer children identified as having SAM to nutritional management units. All women identified to be Mother-MUAC were grouped in central locations for a one-day training session. Training was conducted by a team comprised of two nurses – one from the RCS and the other a PUI staff member.

Implementation of community-based screening and referral

Following the training, each mother received MUAC tapes and began to screen all children aged 6-59 months in their village/neighbourhood on a monthly basis. Mothers were also given yellow and red coupons to pass on to the caregivers of children identified with acute malnutrition in place of referral forms (yellow if the child was referred for MAM and red if the child was referred for SAM). When a child was identified as having either MAM or SAM, the caregiver was sensitised by the trained mother to transfer the child to the HC for treatment. If the caregiver refused, further sensitisation sessions were held to overcome the barriers preventing the mother taking her child to the HC. When the caregiver of the identified child went

⁴ The Mother-MUAC approach is being used in Chad by the NGOs: Action contre la Faim, International Rescue Committee and ALIMA.

to the nutrition unit, she gave the coupon to the health worker who then performed a further assessment to validate (or not) the diagnosis based on admission criteria of the national protocol, i.e., either MUAC or weight-for-height z-score. Transportation costs for the referral were borne by the families.

Follow-up and reporting

Monitoring of the activity was carried out by the CHWs who were already trained and experienced in MUAC screening. Each month, the CHWs summarised the number of children referred via Mother-MUAC at each HC. Each CHW also conducted random MUAC measurements in households covered by the Mother-MUAC programme to ensure the effectiveness of the screening and the reliability of measurements. A monthly review was conducted with the PUI teams. When an area showed low performance, on-site individual training was conducted in order to improve the quality of measurement.

At the health district level, the PUI project team and the CHWs documented the consistency and reliability of the reported MUAC colour and the presence of oedema reported by mothers compared to the result of CHW screening on arrival at the HC.

Performance analysis

In order to analyse the performance of screening and compare the two approaches, PUI analysed the following indicators pertaining to the treatment of children with SAM:

- Screening coverage: number of children screened for MUAC and/or oedema compared to the total number of children in the coverage area.

- Screening performance: based on the number of children identified as having SAM by the mothers, PUI analysed the number of children who were referred, the number of children referred who arrived at the HC and the number of referred children who were confirmed as having SAM at the HC and treated according to the protocol.
- Treatment performance indicators: based on the number of children who exited the programme, those that exited as cured, dropped-out, died or non-recovered were recorded from both inpatient care and OTCs.
- Mothers' ownership of the activity: the perceptions of mothers around the approach were collected informally by the project managers during the monitoring of the implementation.

Feedback from HC staff was also sought which provided informal yet key feedback on programme implementation.

Programme achievements

From May 2018 to December 2019, 15,004 mothers were identified and trained in the areas of responsibility of 21 HC in the three health districts of Adré, Abougoudam and Abéché.

Screening coverage

Of the 77,920 children aged 6-59 months expected for the period, a total of 66,613 were screened using the Mother-MUAC approach, representing a coverage rate of 85.5% in 21 areas of responsibility.⁵ Over the same period during the previous year (using the CHW-ReCos screening approach), 76,710 children were screened of the 96,417 children expected, with a coverage rate of 79.5% across 24 areas of

responsibility (Figure 1).

Screening performance

The Mother-MUAC approach identified 22,791 malnourished children including 15,812 cases of MAM⁶ (23.7% of the children screened) and 6,979 cases of SAM (10.5% of the children screened). Of the SAM cases detected, 6,271 (89.8%) were SAM cases where mothers accepted referral to a nutritional care unit, 4,971 (71.2% of the SAM cases detected) arrived at a HC supported by PUI and 4,413 (63.2% of the SAM cases detected) were actually admitted for treatment (Figure 2). Therefore, 63.2% (two out of three) of all children identified as having SAM by the mothers were confirmed as having SAM at an HC and treated following the protocol. In comparison, screening by CHWs and ReCos during the previous phase of the project⁷ identified 37,448 malnourished children including 13,471 cases of SAM, among whom 6,767 (or 50.2%, or half) were admitted to a nutritional care unit for treatment.

Therapeutic treatment performance indicators

The cure rate in OTCs was higher in 2019 (95%) after transitioning to the Mother-MUAC approach than before (91.5%). The cure rate in inpatient care was not significantly different, a little over 94% for both approaches. Other performance indicators (exited from the programme as dropped-out, died or non-recovered) improved with the implementation of the Mother-MUAC approach (Figure 3).

Ownership of the activity by the mothers

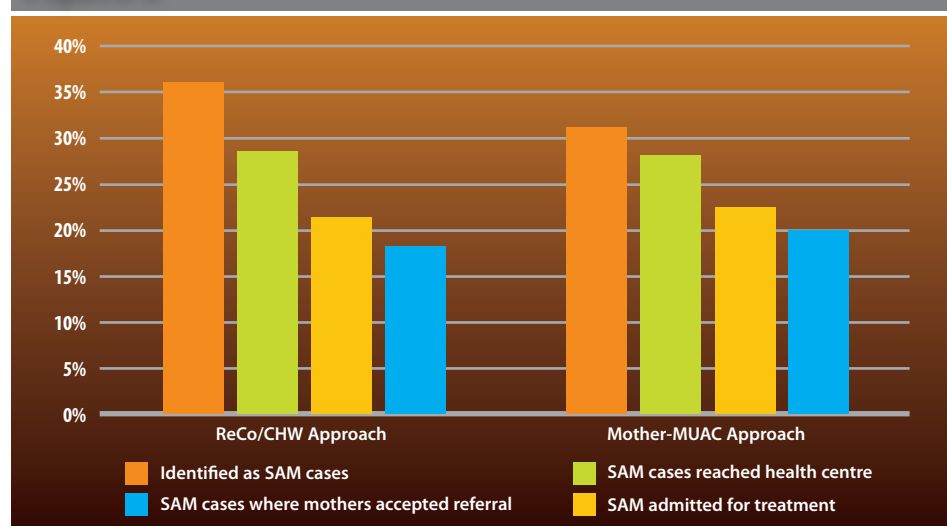
Analysis of mothers' perceptions of the effectiveness of screening through the Mother-MUAC approach were carried out through 60 sessions supervised by the PUI Health Supervisors and the ReCos. These sessions revealed strong participation of mothers in the management of their child's health and a strong sense of ownership of the activity that they carried out on a voluntary basis. The involvement of mothers in malnutrition screening allows them to better understand the signs of malnutrition, to participate in monitoring the nutritional status of their children and increases the frequency of screening of children at the community level.

Nevertheless, 29% of children identified as having SAM by the mothers never arrived at a HC unit. Discussions revealed that the common causes for caregivers not taking referred children to a HC were the long distances to be covered, the natural barriers in the form of ouadis in the rainy season (temporary watercourses making access impracticable), mothers' refusal to be referred or a lack of authorisation from their husbands and the heavy workload of mothers making them unavailable (other household chores or work in the fields). The implementation and monitoring of this approach helped to

Figure 1 Screening coverage according to approach (Mother-MUAC vs. ReCo/CHW)

	Mother-MUAC	ReCo/CHW
# Children expected in coverage area	77,920	96,417
# Children screened	66,613	76,710
Screening coverage	85.5%	79.6%

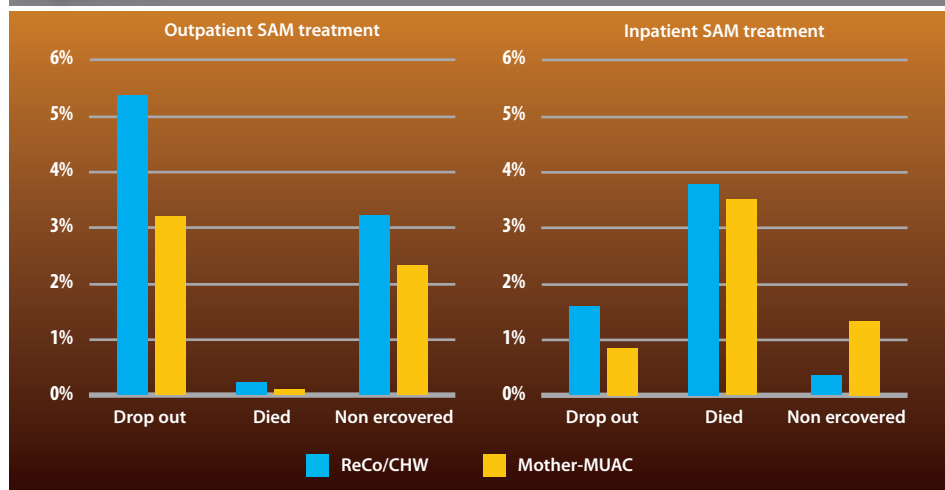
Figure 2 Screening performance (Mother-MUAC vs. ReCo/CHW)



⁵ Children are screened on a weekly basis but counted only once.

⁶ PUI only supported SAM treatment programmes. Children with MAM were therefore not tracked under this programme.

⁷ The first phase of the project covered a larger geographic area, thus the greater number of children expected.

Figure 3 Treatment performance indicators (Mother-MUAC vs. ReCo/CHW)

strengthen community support and facilitate acceptance of the programme in the area. Moving forward, additional efforts will be made to improve compliance with referrals, such as intensifying sensitisation (including targeted at men) and the strengthening of a community solidarity fund, managed by COGES, to provide financial aid to families that are not able to afford the transportation costs.

Health Centre staff feedback

Interviews with HC staff indicated their perception that, as a result of the training of mothers on the Mother-MUAC approach, there is better programme coverage and mothers/children's carers are more cooperative with treatment protocols and less likely to default. There is evidence that the radius of coverage was extended beyond 15km from most HCs, a radius that CHWs and ReCos never exceeded due to a lack of transport available to access remoter villages.

Screening for acute malnutrition at the community level is often the responsibility of CHWs. However, there is growing evidence that families, especially mothers, can play an important role in screening for acute malnutrition through the measurement of their child's MUAC and for signs of oedema in their own communities. In the context of this programme, the Mother-MUAC approach provided better coverage of screening than the CHW-ReCo approach and a higher screening performance, demonstrated by the higher percentage of SAM children identified by mothers being admitted for treatment at an HC (63.2% in the Mother-MUAC approach versus 50.2% in the CHW-ReCo approach). There is some indication that this has led to shorter treatment duration which suggests that children are being referred more quickly for treatment, thereby potentially reducing malnutrition-related morbidity and mortality.

Results also demonstrate strong acceptance

Discussion and conclusions



Mother-MUAC practice measurements on their children in the Mahamata area, Chad

by mothers of the Mother-MUAC approach, both by mothers doing the screening and by mothers whose children are being screened by mother-peers. HC staff are also highly supportive of the approach, due to the improved programme coverage and the cooperation of caregivers. In addition, compared to the CHWs-ReCos approach, the Mother-MUAC approach has reduced the programme support costs by 27%, according to average support cost per HC. Given the lack of funding and the need to ensure regular community screening, the Mother-MUAC approach is proving to be a sustainable approach in this context. The motivation of the mothers is not financial which allows for its sustainability, replicability and scaling up at the national level.

Community-based screening has shown that more regular and earlier detection could reduce the risk of mortality and morbidity in children 6-59 months of age. In our experience, the Mother-MUAC approach has proven effective in facilitating diagnosis and accelerating the management of children in situations of concern. The implementation process is relatively straightforward and empowers mothers to be actors in the health of their children. Regular monitoring of the mothers' activity and good supervision promote control over MUAC measurements.

Although the impacts of COVID-19 were not a major issue in PUI's programme area and did not modify the attendance rate at HCs, appropriate steps were taken to enforce proper prevention measures and to support newly formed epidemic surveillance committees.

Looking ahead, PUI aims to continue supporting the management of acute malnutrition in this area while working towards handing over activities to the government structures and expanding its activities to better address the underlying causes of malnutrition. With the support of the 11th European Development Fund, and in partnership with a local NGO, this new phase will focus on increasing agricultural production while also working towards more preventive nutrition activities, including improving infant and young child feeding practices.

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AFGHANISTAN

What we know: In emergencies, reliable and up-to-date data is critical to inform the response but is often limited.

What this article adds: Nutrition Cluster partners in Afghanistan undertook a process to calculate wasting caseloads and prioritise geographic areas for services to inform the Humanitarian Needs Overview (HNO) and funding decisions. People in need were calculated using combined global acute malnutrition (cGAM), based on SMART surveys. As recent SMART survey data was unavailable in many provinces, data from 2015 was used and, where this was unavailable, extrapolations were made using data from adjacent provinces. In total, 2.9 million children under five years and 650,438 pregnant and lactating mothers were identified being in need of life saving nutrition services. Due to lack of funds, provinces were prioritised on the basis of recent SMART survey data and, where this was unavailable, either Seasonal Food Security Assessment data or mid-upper arm circumference (MUAC) screening data from Health Management Information Surveys. Data on five known aggravating factors (diarrhoea prevalence, household food insecurity, immunisation coverage, conflict and risk of COVID-19) were also considered. As a result, 26 priority provinces were identified (of 34). Based on an analysis of emerging needs, gaps and humanitarian partner presence, 88 districts within 21 provinces were finally targeted using funds available. For situations where SMART survey data is unavailable, a globally validated standard methodology and guideline for geographic prioritisation is required to support the better identification and targeting of locations for nutrition services.

Calculating wasting caseloads and geographic prioritisation of nutrition services in the context of limited data in Afghanistan

By Beka Teshome Bongassie, Said M Yaqoob Azimi and Maureen L. Gallagher



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The Afghanistan Nutrition Cluster geographic prioritisation and caseload calculation for Humanitarian Needs Overview 2020 was enabled by the active participation and contribution of individual members of the Strategy Advisory Group and Assessment and Information Management Working Group. The authors would like to thank Aye Aye Khaine for her input into this article.

The analysis, interpretation and conclusion reflected in this article are those of the authors. They do not necessarily represent the views of UNICEF or Action Against Hunger.

Context

The current humanitarian crisis in Afghanistan is widespread and severe; in 2020 it was estimated that 14 million people were in need of humanitarian protection and assistance (OCHA, 2020a). The crisis is characterised by open internal conflict between the government and opposition groups, major internal displacement, increasing food insecurity, high levels of malnutrition, limited access to basic services and access challenges to crisis affected areas.

Malnutrition in all its forms is persistent and widespread across Afghanistan, especially among children under five years of age and pregnant and lactating women (PLW). Acute and chronic malnutrition are highly prevalent with 41% of children under five years of age stunted and 10% wasted (Government of Afghanistan, 2013).

The Afghanistan Nutrition Cluster has been active since 2008. It has over 50 active partners including government, national non-governmental organisations (NGOs), international NGOs, United Nations (UN) agencies, civil society, donors and observers. The national Nutrition Cluster coordination team is currently comprised of a Nutrition Cluster coordinator, an NGO co-lead and a nutrition information management specialist.

The director of the Public Nutrition Directorate (PND) is the co-chair from the government counterpart. The Nutrition Cluster strategic advisory group (SAG) provides strategic direction, guidance and advice to the Nutrition Cluster. There are five nutrition technical working groups (TWGs) in Afghanistan housed under the PND, namely integrated management of acute malnutrition, assessment and information management (AIM), mother, infant and young child nutrition, capacity development and micronutrients. The primary responsibility of the TWGs is to provide technical support to partners to improve the quality and coverage of services, develop standard operating procedures, review programmes, identify gaps and problems, complete survey validation (AIM), knowledge management and disseminate information to partners.

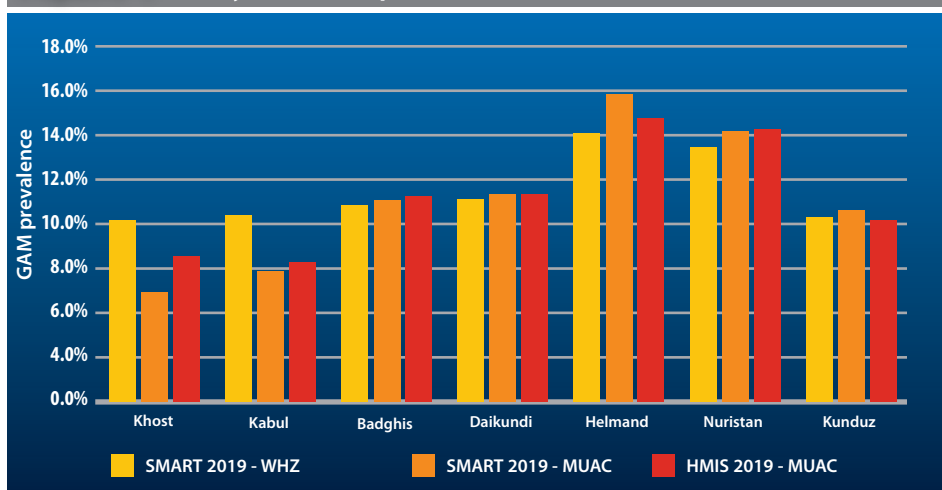
The nutrition response in Afghanistan is guided by the terms of reference of the Nutrition Cluster and guidelines and protocols endorsed by the Afghanistan Government. Services for the treatment and prevention of child wasting are implemented through multiple delivery modalities including fixed health facilities (basic health centres, comprehensive health centres, sub-health centres, district and provin-

Box 1 People in need (PiN) calculation formula

Total nutrition caseload (PiN)

=
 Number of SAM children under five years (using cSAM) (A)
 +
 Number of MAM children under five years (using cMAM) (B)
 +
 Number of undernourished PLW (MUAC <23cm) (C)
 +
 Number of children and women at risk of malnutrition among IDPs, refugees, returnees, vulnerable populations residing in informal settlements and populations affected by rapid onset crisis and COVID-19 (D)

Figure 1 Comparison of GAM prevalence using 2019 HMIS data vs 2019 SMART surveys in selected provinces where all data was available



cial hospitals) and through the deployment of mobile teams to hard-to-reach areas.

Insufficient and delayed funding for lifesaving nutrition activities are major challenges for nutrition partners in the delivery of timely assistance in Afghanistan. As part of the overall joint humanitarian analysis and planning process, the Nutrition Cluster and its partners undertook a process to calculate caseloads (people in need (PiN))¹ and prioritise geographic areas for services to inform the Humanitarian Needs Overview (HNO) to help mobilise and prioritise funds for nutrition programming. Given that few recent Standardised Monitoring and Assessment of Relief and Transitions (SMART) surveys exist in Afghanistan and the demographic and health survey (DHS) does not currently include anthropometric data, alternative methods had to be found using available data. This article describes the process undertaken, results and lesson learnt.

Caseload calculation

Sources of data for caseload calculation

Following discussions with the SAG and Nutrition Cluster partners, it was agreed that the PiN would be calculated using the combined prevalence of global acute malnutrition (GAM), referred to as cGAM. This is an aggregate indicator that includes all cases of GAM as defined by weight-for-height z-score (WHZ) <-2, mid-upper arm circumference (MUAC) <125mm, and/or bilateral pitting oedema.² This is further aggregated into combined severe acute malnutrition (cSAM) and combined moderate acute malnutrition (cMAM) calculated by subtracting cSAM from cGAM).

SMART surveys are the only available source of data for cGAM and cSAM in Afghanistan. However, lack of funding and lack of access to conflict-affected areas meant that recent SMART surveys (2018-2020) were only available for 17 of Afghanistan's 34 provinces. The decision was collectively made to use the results of available SMART surveys from 2015 onwards which were

available for 31 provinces. For the three remaining provinces with no SMART surveys (Wardak, Sar-e-Pul and Faryab), extrapolations were made using the results of adjacent provinces (based on the assumption that they share similar geographic, population and livelihood characteristics). The most recent population projections issued by the United Nations Population Division³ from September 2019 were used for estimating the total caseload for 2020. The under-five population was estimated to represent 17.3% of the total population and the number of PLW was estimated to represent 8% of the total population (NSIA, 2019).

Caseload calculation methodology

The calculation formula is described in Box 1. Caseloads for SAM (A) and MAM (B) were calculated by multiplying the prevalence of cSAM and cMAM by the under-five population and multiplying this again by a correction factor of 2.6 to cater for incidence of acute malnutrition. The caseload for undernourished PLW (C) was estimated using the proportion of acutely malnourished PLW (MUAC <23cm) in a province multiplied by the estimated number of PLW in that population.

To estimate the likely impact of the COVID-19 pandemic on SAM and MAM prevalence, drawing from the experience of previous malnutrition crises⁴, it was estimated that SAM and MAM prevalence would increase by 20% in integrated food security phase classification (IPC) 4 provinces, by 15% in IPC 3 provinces and by 10% in IPC 2 provinces.⁵ This percentage increase was applied to SAM, MAM and PLW caseloads.

We estimated that all children under five years of age and PLWs among internally displaced persons (IDPs), returnees, refugees, vulnerable populations residing in informal settlements and populations affected by rapid onset emergencies, including COVID-19, were nutritionally at risk (requiring infant and young child feeding in emergencies (IYCF-E) support, micronutrient supplementation or blanket supplementary feeding programme (BSFP) services).

The number of PiN (D) among these populations was estimated to be 25.3% (17.3% of children plus 8% of PLW).

Caseload results

Using this methodology, it was estimated that, in 2020, 2.9 million children under five years of age and 650,438 PLW were part of the PiN estimate. Of the 2.9 million acutely malnourished children under five years of age, it was estimated that 783,583 children (27%) would suffer from SAM. A further 435,445 children under five years of age, 232,877 PLW and 414,534 mothers and caretakers were also estimated to be nutritionally 'at risk' among IDPs, refugees, returnees, vulnerable populations residing in informal settlements and populations affected by rapid onset crisis, including COVID-19. Adding those up, the Nutrition Cluster identified 4.63 million children and women who would need emergency nutrition assistance in 2020.

The highest proportion of malnourished children was located in Kabul (11% of the total PiN), followed by Nangarhar (8.2% of the total PiN), Helmand (6.3% of the total PiN) and Herat (6.3% of the total PiN). Of the total PiN, the COVID-19 pandemic was predicted to have pushed an extra 106,214 children under five years of age into SAM, some 284,688 children under five years of age into MAM and some 87,298 undernourished PLW to require lifesaving treatment and nutritional support.

¹ Defined as people who are acutely malnourished and in need of lifesaving treatment or nutritional support within the year.

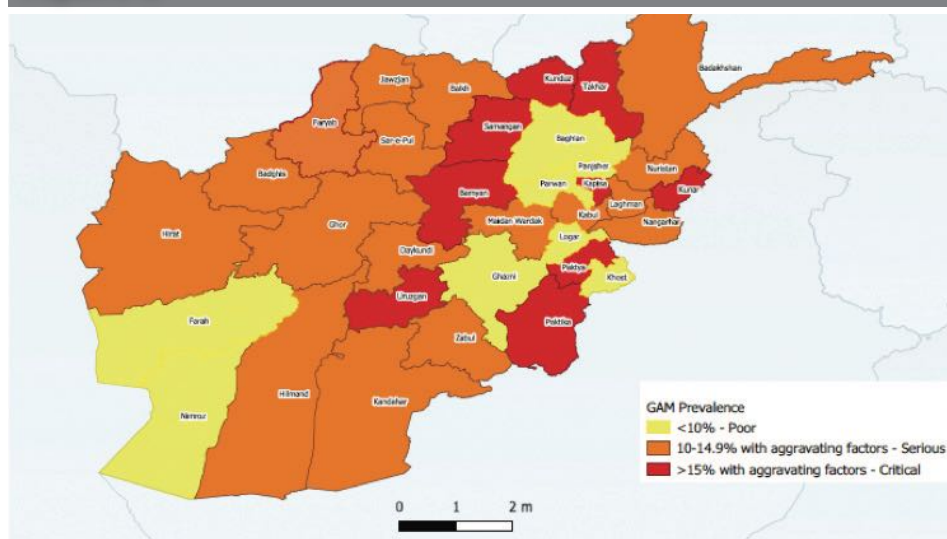
² A fuller description of cGAM can be found in an earlier article in Field Exchange:

<https://www.enonline.net/fex/61/gamafghanistan>

³ <https://data.worldbank.org/indicator/SP.POP.GROW?locations=AF>

⁴ In the absence of COVID-19 estimates at the time, and the lack of country-specific or regional data, estimations drawn from Ethiopia were used. Those were estimates for an emergency nutrition response in Somali region refugee camps during the 2012 drought to account for an increased burden of malnutrition.

⁵ The average increase for the 34 provinces was 15%. This is slightly higher than the Lancet paper global estimate of 14.3% increase in the prevalence of moderate or severe wasting among children younger than five years due to COVID-19 ([https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)31647-0/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31647-0/fulltext))

Figure 2 Afghanistan 26 provinces prioritised for nutrition response in 2020

Prioritisation of provinces for lifesaving nutrition services

The overall estimated cost to provide lifesaving nutrition services to the 4.63 million children and women in need was USD234 million. Insufficient resources and limited programme capacity meant that provinces needed to be prioritised to receive nutrition services.

Estimation of GAM prevalence

Geographic prioritisation is usually carried out on the basis of the prevalence of GAM among children under five years (based on WHZ) using data from recent SMART surveys, validated by the AIM-TWG. However, as already discussed, recent SMART survey data (2018–2020) was only available for 17 provinces. For 10 of the remaining provinces, MUAC data collected through the Seasonal Food Security Assessment (SFSA) was used, validated by the AIM-WG. MUAC data for children aged 6 to 59 months has been collected via the SFSA since 2019 with support from the Nutrition Cluster to Food Security and Agriculture Cluster partners who provided MUAC training, technical guidance and support during data collection.

In seven provinces where neither SMART survey nor SFSA data was available, the routine 2019 MUAC screening data from health facilities collected within the Health Management Information System (HMIS) was used. Although the

results are not directly comparable to the survey data due to differences in methodology, data analysis found them to be fairly consistent with SMART survey data (Figure 1). Table 1 summarises the final GAM data and reliability scores. The identification of high priority provinces was guided by the IPC emergency thresholds for acute malnutrition guidance (IPC, 2019), i.e., $\geq 15\%$ GAM (critical) and/or $\geq 10\%$ GAM (serious).

Identification of aggravating factors

To complement the GAM classification, provinces with aggravating factors that are known drivers of acute malnutrition (or hypothesised in the case of COVID-19 risk) were identified. Aggravating factors were selected as follows: prevalence of diarrhoea, household food insecurity, coverage of childhood immunisation, level of conflict (population displacement) and risk of COVID-19 transmission. Multiple available sources of data were used to assess the presence of these factors in each province. These selected thresholds and findings are described in Table 2.

Prioritisation of provinces

The six indicators described above (prevalence of GAM and five drivers) were used to prioritise provinces for nutrition services. High priority provinces were determined as those with critical levels of acute malnutrition ($\geq 15\%$ GAM) or serious levels of acute malnutrition ($\geq 10\%$ GAM) with two or more aggravating factors (according to the thresholds described in Table 2). A total

of 26 provinces were categorised as top priority provinces: nine provinces had a GAM prevalence above 15% and 17 provinces had a GAM prevalence above 10% with two or more aggravating factors (Figure 2).

Eighty five percentage of the wasting caseload among children under-five in Afghanistan is present in these 26 priority provinces. This is a total of 2.47 million people. The total cost for reaching PiN in these priority provinces was estimated to be USD139 million.

Further targeting of resources

In the face of overwhelming needs and severe funding constraints, in 2020 the Nutrition Cluster had to further prioritise districts for support for Afghanistan Humanitarian Funding (AHF) through which USD8 million was allocated for nutrition services. A further exercise was therefore undertaken to prioritise districts within the 26 priority provinces for the targeting of these limited resources for lifesaving wasting treatment and prevention services. This exercise was carried out using gap analysis methodology. Information was drawn from the online nutrition database, HMIS, recent nutrition assessment reports, supportive supervision reports and updated information on hard-to-reach districts and functional health facilities. This provided a picture of overall nutrition service coverage and emerging needs and gaps.

Using these results, districts were prioritised if they had emergency levels of GAM ($\geq 15\%$), poor coverage of SAM treatment ($<30\%$), low coverage of functional health facilities or high levels of disruption to health services (due to conflict) with high GAM rates ($\geq 10\%$), or high numbers of recent IDPs with high GAM rates ($\geq 10\%$). Districts were also prioritised where humanitarian partners had operational presence and capacity to implement global and adapted guidelines and standards with COVID-19 preventative measures. As a result of this exercise, 88 districts were targeted in 21 provinces.

Discussion

The estimated wasting caseload of 2.9 million for 2020 is much higher than that estimated in the previous round of calculations in 2019 of 1.58 million. This is partly because all 34 provinces were included in this exercise, compared to 22 in 2019. It is also likely due to the increase in acute malnutrition as a result of the impacts of movement restrictions related to the COVID-

Table 1 Data reliability scores for GAM levels used in Afghanistan

Source of data	Recentness of assessment	Robustness of methodology	Data quality validation	Indicator used for population estimate of acute malnutrition	Reliability score (R4 is most reliable and R1 is least reliable)	# of provinces concerned
	Ideal: <12 month	Ideal: Standard/representative	Mandatory: AIM-WG validation	Ideal: WHZ	Ideal: R4	
SMART survey (Sept 2018 – Aug 2019)	1 – 12 months	Standard/representative	Validated	WHZ	R4	10
SMART survey (Sept 2018 – Aug 2019)	13 – 24 months	Standard/representative	Validated	WHZ	R3	7
SFSA assessment	1 – 12 months	Sub-standard	Validated	MUAC	R2	10
HMIS screening data	1 – 12 months	N/A	N/A	MUAC	R1	7

Table 2 Aggravating factors identified in Afghanistan, 2020

Aggravating factors	Data source	Thresholds	Findings
1. Diarrhoea prevalence among children under five years	2018 Afghanistan Health Survey	≥18.1% (greater than the national prevalence of diarrhoea according to the MoPH, 2018)	16 provinces had high prevalence of diarrhoea (above 18.1%) – 13 out of these 16 also had high GAM prevalence (≥10%)
2. Household food insecurity	International Phase Classification (IPC)	≥36% of people in IPC levels 3 and 4 (above the percentage of the general population in IPC levels 3 or 4 according to FSAC, 2020)	15 provinces food insecure (IPC levels 3 and 4 where ≥36% households food insecure) – 14 out of these 15 also had high GAM prevalence (≥10%)
3. Immunisation coverage	2018 Afghanistan Health Survey	Immunisation coverage <50% (less than the national level of immunisation coverage according to the MoPH, 2018)	25 provinces had low immunisation coverage (less than 50%) – 21 out of these 25 also had high GAM prevalence (≥10%)
4. Conflict	Office for the Coordination of Humanitarian Affairs (OCHA) conflict-induced displacement tracker (OCHA, 2020b)	Number of conflict-induced displaced people ≥1,228 (median number of conflict-induced displaced people)	12 provinces had high levels of conflict induced displacement – with strong correlation with high GAM rates (Figure 2)
5. Risk of COVID-19	IOM Displacement Tracking Matrix (DTM) Afghanistan (10 March 2020)	Provinces with ≥50% COVID-19 'at risk' districts, through human mobility	2 provinces had a high number of COVID-19 at risk districts (above 50%). Both of these provinces also had high GAM prevalence (≥10%)

19 pandemic resulting in lack of access to services and increased food insecurity in Afghanistan.

Geographic prioritisation and reliable estimates of caseloads for nutrition treatment and prevention services are critical for strategic and operational decision-making and the planning of quality services in the context of competing priorities and limited resources. The SMART survey is the main globally validated methodology for achieving timely and accurate nutrition data at provincial level. However, where SMART survey data is unavailable due to funding shortfalls and operational challenges, the experiences shared here demonstrate that it is possible to bring together a wider set of data for analysis to inform the HNO.

In the context of Afghanistan in 2020, a PiN calculation was made in order to create an understanding of the magnitude of the problem on the ground and to inform the formulation of a response plan based on the real needs of affected communities. In the face of immense needs, the prioritisation of areas for nutrition support was required. This was achieved through a comprehensive analysis of multiple available data sources to identify the prevalence of acute malnutrition and aggravating factors contributing to malnutrition. In the face of very limited re-

sources, a wider gap analysis was also undertaken to prioritise provinces for immediate action.

The process has obvious limitations. Combined prevalence of acute malnutrition was used as a basis for the caseload calculation. However, the availability of SMART survey data covering all provinces within a 12 to 18 month period was limited. Thus, SMART surveys from previous years were used which may have resulted in the under or overestimation of caseloads in those provinces. The use of HMIS nutrition data to prioritise provinces also has limitations as facility-based routine screening may be subjected to an unknown level of sampling bias. A further limitation is that the impact of COVID-19 on the nutrition situation is not yet well understood. Data shows an initial drop in the uptake of nutrition services due to fear of transmission with a subsequent rise in the adaptation of programming based on international guidelines. However, the actual impact on nutrition status is still unknown and therefore caseloads in this exercise may be over or underestimated.

Conclusion and recommendations

Despite the limited availability of gold standard data, it is possible to use a wider data set of proxy indicators to estimate caseloads and un-

dertake prioritisation to target limited resources to people most in need. This exercise has demonstrated the increasing severity of the crisis in Afghanistan and the need for a higher coverage of wasting prevention and treatment services. On this basis, the Nutrition Cluster partners in Afghanistan call for local civil society and the international community to commit to the Nutrition Cluster priorities outlined in the multi-sector humanitarian response plan to ensure that the nutritional needs of PiN can be met.

In situations like Afghanistan where recent and timely gold standard data sources are not available, a globally validated standard methodology and guideline for geographic prioritisation is required to support the better identification and targeting of locations with critical nutrition needs. This has relevance to the next iteration of the Nutrition Humanitarian Needs Analysis Guidance to come in 2021 (GNC 2020).

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HAITI

What we know: Large-scale food fortification of regularly consumed staple foods can significantly improve the nutritional status of children and of pregnant and lactating women.

What this article adds: Micronutrient deficiencies are widespread in Haiti. Food fortification has been shown to be a safe and cost-effective intervention. In 2017, a panel of experts identified that the fortification of wheat flour with iron and folic acid ranked second among 85 interventions that could have the most social, economic and environmental benefits in Haiti. The same year, the Parliament passed a law making it a requirement to fortify wheat flour with vitamin B1, B2, B3, folic acid, iron and zinc, salt with iodine and edible oil with vitamin A. The RANFOSE project is supporting the implementation of the food fortification law by providing technical assistance to the Government of Haiti to create a legislative and regulatory environment that supports the production and importation of fortified foods, to make fortified foods that meet national standards available and accessible, to establish a system of quality assurance, quality control and monitoring of sustainable fortified foods and to raise consumers' awareness to understand and accept the benefits of fortified foods. As a result of these and other efforts, fortified products are increasingly replacing unfortified products on the Haitian market despite constraints such as missing legal application texts to enforce the law, the lack of adoption of a unique food fortification logo and the low capacities of the national testing laboratory.

Large-scale food fortification efforts in Haiti

By Ruth Climat, Yves-Laurent Régis and Chrisla Joseph



Ruth Climat is a medical doctor with a Master's degree in human nutrition. She has been working in the medical and nutrition field for more than 10 years in Haiti. She is currently Technical Director of the RANFOSE project for Partners of the Americas.



Yves-Laurent Régis has over 30 years of experience in the management, monitoring and evaluation of programmes for development and humanitarian organisations. He is currently the Chief of Party for the food fortification project implemented by Partners for Americas and the Global Alliance for Improved Nutrition (GAIN).



Chrisla Joseph is a specialist in monitoring and evaluation with over 10 years of experience in managing and assessing food security and development projects. She is the project coordinator of the RANFOSE project.

The *Ranfôse Abitid Nitrisyon pou Fè Ogmante Sante* (RANFOSE) project is funded by the United States Agency for International Development (USAID). Successes achieved were made possible thanks to the contribution of the Ministry of Health and the industries fully involved in food fortification in Haiti (*Les Céréales d'Haiti, Les Moulins d'Haiti, Carribex, HUHSA, DEKA Group and Bon Sèl d'Haiti*).

Malnutrition and micronutrient deficiencies in Haiti

Deficiencies in micronutrients (vitamins, minerals and trace elements), also known as 'hidden hunger', have devastating consequences on populations, the clinical signs of which often only become visible after the deficiency has caused major, often irreversible, internal damage. These deficiencies are directly associated with a significant increase in the risks of morbidity and mortality and have consequences not only for those affected but also for families, health services, education systems and societies in general. Despite the scarcity of complete and/or recent data, micronutrient deficiencies are considered to be a public health problem in Haiti. According to the latest Demographic and Health Survey (DHS) of 2016/2017, iron deficiency anaemia was present in 49% of non-pregnant women of childbearing age and in 66% of children aged 6 to 59 months (Figure 1) (IHE & ICF, 2018). Furthermore, nearly 35% of the Haitian population are considered to be exposed to the risk of zinc deficiency (Wessells & Brown, 2012) and 2006 survey data showed that 32% of children were vitamin A deficient and 25% of children aged 6 to 12 years were iodine deficient (MSPP & UNICEF, 2006).

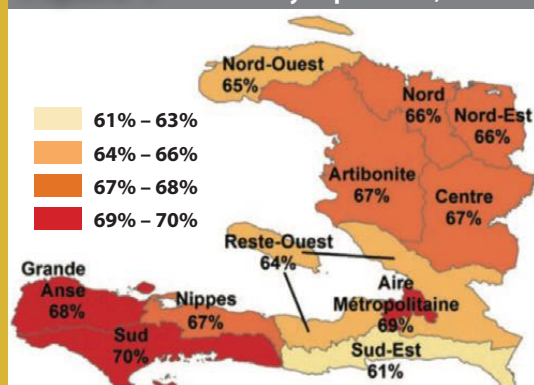
Micronutrient deficiencies occur alongside other forms of undernutrition in Haiti. A January 2020 Standardised Monitoring and Assessment of Relief and Transitions (SMART) survey revealed that nearly one in four children under five years of age

(22.7%) suffered from stunting and 6% were wasted. Sub-optimal infant and young child feeding practices in the country contribute to poor nutrition status. The results of the 2016/2017 DHS showed that only one in four children under six months of age in Haiti was exclusively breastfed and only 25%, 40% and 11% of children aged 6 to 23 months achieved minimum diet diversity (MDD), minimum meal frequency (MMF) and minimum acceptable diet (MAD) respectively (IHE & ICF, 2018). The consumption of foods rich in micronutrients such as vegetables and nuts (28 to 62%), dairy products (42 to 35%), meat (14 to 38%), eggs (6 to 7%) and food rich in vitamin A (23 to 39%) is uncommon (Ayoya et al., 2014). Chronic food insecurity restricts access to a healthy, diversified and balanced diet and contributes to low diet diversity. According to the latest report from the National Food Security Coordination (CNSA, 2020), nearly four million Haitians are acutely food insecure (Figure 2).

Ongoing interventions to address micronutrient deficiencies

UNICEF introduced the use of multiple micronutrient powders (MNPs) in Haiti in 2010 to improve the nutrient quality of complementary foods for children aged 6 to 23 months and since that time the Ministry of Public Health and Population (MSPP) has adopted their use in its national nutrition policy (Ayoya et al., 2014). Several other interventions, including vitamin A supplementation, prenatal micronutrients distribution to pregnant and lactating women

Figure 1 Prevalence of anaemia in children by department, Haiti



Source: 2016/2017 DHS (IHE & ICF, 2018)

and nutritional education, have also been ongoing in Haiti for decades. Unfortunately, however, the coverage and impact of these interventions remains low. According to the latest DHS, only 7% of children had received iron supplements in the previous seven days, 30% had received a vitamin A capsule in the six months prior to the survey and less than half of women of reproductive age (43.2%) reported receiving iron tablets during their last pregnancy (IHE & ICF, 2018). Although no studies have been undertaken to clearly identify the reasons behind these poor performances, poor access to health services and the disruption of inputs to health facilities are commonly reported.

The state of food fortification in Haiti

Several interventions are capable of reducing micronutrient deficiencies but food fortification, as a complement to other interventions, has been shown to be the safest in terms of the least side-effects and to have the most significant cost-benefit ratio. Worldwide, the benefits of fortifying staple foods with iron and salt with iodine are estimated to be USD7.2 billion per year (Horton et al., 2010). Evidence of measurable improvements in the micronutrient status and health outcomes in women and children in low- and middle-income countries through food fortification are also reported (Keats et al., 2019).

In 2017, applying the Copenhagen Consensus method, a panel of experts identified that the fortification of wheat flour with iron and folic acid ranked second among 85 interventions that could have the most health, social, economic and environmental benefits in Haiti. According to the report, spending HTG331 million¹ to fortify 95% of wheat flour would prevent 140 deaths from neural tube defect and more than 250,000 cases of anaemia each year, with profits of HTG7.9 trillion (HaitiPriorise, 2017). At the same time, it was estimated that USD34 million and USD37 million could be saved each year by improving iodine and iron status respectively (Dieneet al., 2014). As a result, the MSPP adopted food fortification among the five strategic objectives of the national nutrition policy and pushed for the drafting of a law to make food fortification mandatory in the country. This work finally paid off in February 2017 when the Parliament passed legislation making it a requirement to fortify wheat flour, salt and edible oil imported or produced locally throughout the national territory. Wheat flour would be fortified

with vitamin B1, B2, B3, folic acid, iron and zinc, salt with iodine and edible oil with vitamin A.

RANFOSE project

To support these efforts, in July 2017, the United States Agency for International Development (USAID) in Haiti launched the *Ranfòse Abidit Nitrisyon pou Fè Ogmante Sante* (RANFOSE) project. This project is implemented by Partners of the Americas and the Global Alliance for Improved Nutrition (GAIN) in collaboration with the MSPP, the private sector and other partners in order to:

- Create a legislative and regulatory environment that supports the production and import of fortified foods in Haiti;
- Make fortified foods that meet national standards available and accessible;
- Establish a system of quality assurance, quality control and monitoring of sustainable fortified foods;
- Educate consumers to understand and accept the benefits of fortified foods.

The following activities have taken place in support of these efforts.

Creating an enabling environment

In March 2018, the RANFOSE project launched a Food Fortification Working Group (FFWG) made up of members of the private sector including wheat flour mills, oil bottling companies, the country's iodised salt plant and various major importers of commodities as well as civil society, United Nations agencies, government entities and consumer associations. Members of the FFWG meet on a regular basis to discuss the challenges and progress of fortification. An action plan of the FFWG was developed that includes a set of activities to coordinate and mobilise all sectors and organisations for the reduction of micronutrient deficiencies and gives directives for quality control, the promotion of fortified foods, measurement of progress and accountability of all stakeholders

Provision of technical support

Following the launch of the RANFOSE project, assessments of the flour industry and salt and oil plants were carried out and technical support provided to local businesses and importers to identify needs and ensure compliance with the fortification levels recommended by MSPP and the Ministry of Commerce and Industry.² Working sessions are organised on a regular basis with the relevant competent state authorities such as MSPP, the Ministry of Trade, the Ministry of Economy and

Finance, Customs and the Ministry of Agriculture with the objective of strengthening their involvement in the implementation of food fortification in Haiti. In addition to the technical support provided to companies, the members of the working group were connected to the GAIN premix facility for the acquisition of good quality premixes.

Promotion of food fortification

Several activities have been organised with different actors in coordination with MSPP to promote food fortification. Advocacy and awareness-raising materials were developed and a radio and television communication campaign was launched in July 2020 to raise awareness among the population and industrial users of fortified products about the consequences of micronutrient deficiencies and the benefits of fortified foods. To help customers make an informed choice, a food fortification logo to be affixed to fortified products was developed and is awaiting final approval from the Department of Health before it can be deployed.

Achievements of the programme to date

The strategies used to support and expand fortification in Haiti have brought about some successes to date. Today, all locally produced foods targeted for fortification are available in a fortified version in the local market and some imported versions are also fortified. The number of importers who market fortified products is steadily increasing, as described in the next section. Figure 3 below presents the availability of fortified products (wheat flour, oil and salt) before and after the implementation of the RANFOSE project.

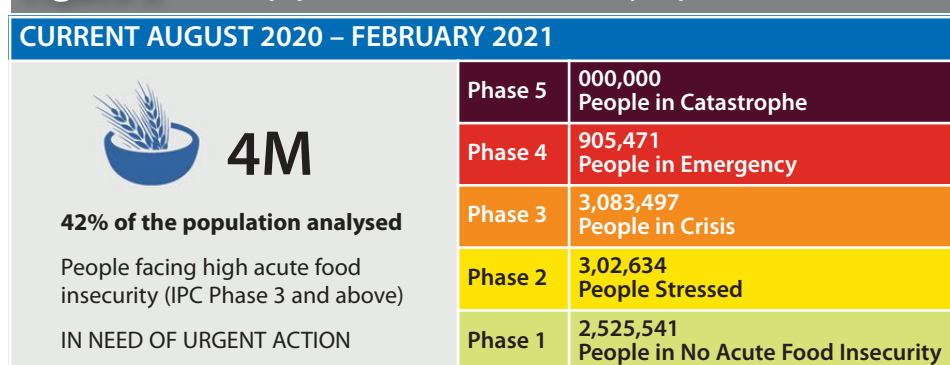
Wheat Flour

Wheat flour is consumed in several forms in Haiti including in soups, porridge, pasta, bakery products and pastries and snacks (bread, candies, cookies, pâtés and other sweet or savoury fried dough). According to the Famine Early Warning Systems Network (FEWS NET), in 2018 the annual consumption of wheat flour was 14kg/person on average, or nearly 240-300,000 metric tons of wheat flour per year, 72% of which was produced in Haiti (FEWS NET, 2018). Two companies fortify local flour and some imports are fortified, although adjustments are still underway to adapt the levels of fortification to meet the recommendations of the MSPP. Currently, over three quarters of the flour available on the Haitian market is actually fortified. Two local companies share a total production of fortified flour of 217,100 metric tons per year and a major player imports nearly 12,000 metric tons of fortified flour per year. In August 2020, another local flour mill officially started production of fortified wheat flour and is intending to supply the aforementioned main importer who will therefore replace the imported flour with locally produced flour.

Vegetable oil

Two oil mills are bottling imported oil in Haiti and have been fortifying this with vitamin A since

Figure 2 Haitian population in acute food insecurity, September 2020



Source: IPC analysis, September 2020 (CNSA, 2020)

¹ The 'gourde' (HTG) is the national currency of Haiti

² Since October 2020 it has been mandatory for importers of wheat flour, salt and vegetable oil to obtain a certificate of compliance with fortification issued under the Ministry of Commerce and Industry.

October 2018. One of these mills decided to also enrich the butter and margarine that it produces as well. These two oil mills represent roughly 50% of the Haitian market share with a total of 6,500 to 8,500 metric tons received in bulk per month. At the same time, several major importers have also taken the step to import fortified oil. Today, seven brands of oils are fortified with vitamin A.³ We can therefore estimate that nearly 80% of the oil available on the Haitian market is fortified.

Salt

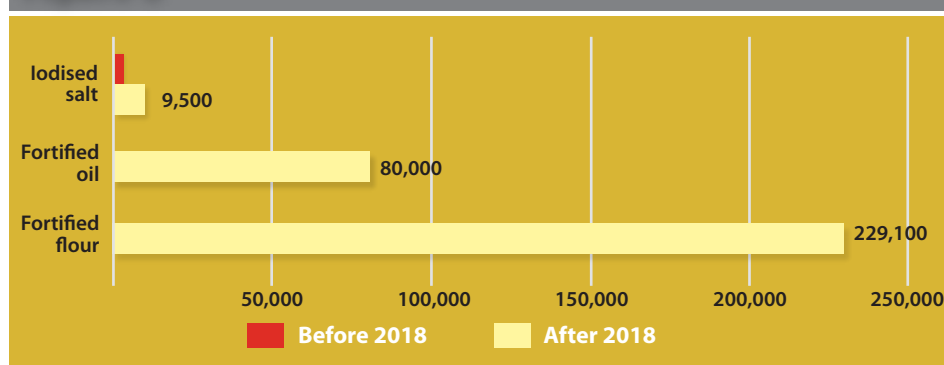
The vast majority of iodised salt available in Haiti is imported and contains potassium iodide. According to MSPP, this chemical form is not recommended for a tropical country like Haiti and instead industries should use potassium iodate. One local factory does produce iodised salt that complies with the MSPP recommendations. This factory produces approximately 300 metric tons of iodised salt per month in the form of both coarse salt and fine salt. In August 2020, a new player joined the programme to commercialise locally produced iodised salt. This new distributor has the potential to help improve the availability of appropriately fortified salt which currently represents slightly over 16% of the salt market.

Despite the fact that the population has historically preferred locally produced non-iodised salt for household use, which is cheaper, sales of locally-produced iodised salt have increased recently. This is likely as a result of the promotional efforts of the MSPP particularly around the use of iodised salt in school canteens, supported by RANFOSE, and the promotion of its use via other organisations such as Fonkoze⁴ or Projet Santé.⁵

Challenges to food fortification in Haiti

In spite of the successes of the national food fortification programme in Haiti, there have been major challenges to its progress as a result of the prolonged political crisis in the country, often accompanied by violent street demonstrations and roadblocks as well as fuel shortages which have regularly hindered the transporting of fortified products throughout the country. In addition, frequent changes in government have affected planning and coordination with public entities and the deterioration of the economic situation has limited the population's access to fortified foods. This situation has been exacerbated by the impacts of the COVID-19 pandemic which have led to a further slowdown of the economy and

Figure 3 Availability of foods fortified in Haiti before and after 2018, in metric tons



interruptions to the food supply chain. These external factors have led to major delays in the implementation of activities linked to food fortification efforts. For instance, although the legislation regarding food fortification was enshrined in law almost four years ago, some essential pillars of the legal framework are still not yet in place, for example legal texts specifying the modalities of the application of the law, food fortification standards, rules and guidelines and a logo to clearly identify fortified products for consumers.

Another challenge is that companies that voluntarily adopt fortification and absorb the associated costs do not receive any kind of support or incentive from government authorities while those who do not fortify their products are not penalised. In the absence of effective control and sanctions, company adopters may lose motivation to continue enriching their products. This needs to be addressed. A final challenge is that, currently, the quality assurance and control system is poorly harmonised and inefficient. Some entities of the quality control system are not yet involved in food fortification due to the lack of publication of application texts. Furthermore, the capacities of the national laboratory need to be strengthened to provide appropriate quality control testing.

Conclusion

Large-scale food fortification of regularly consumed staple foods can significantly improve the nutritional status of children and pregnant and lactating women. Fortification, if well implemented, has the capacity to reach the most vulnerable populations in communities that other interventions cannot reach. Efforts in recent years by the government, supported by the RANFOSE project, have considerably improved the availability of

micronutrients in oil, salt and wheat flour in Haiti. The food vehicles selected for fortification are widely consumed by the entire population, fortified products are increasingly replacing unfortified products, routed through the same distribution channels, and since no price increase has been recorded following fortification, we expect that these efforts will lead to greater availability of micronutrients for the population throughout the national territory.

Targeted efforts are needed to overcome challenges to ensure the full and sustainable rollout of food fortification. To this end, RANFOSE will continue to advocate for the publication of technical legal texts by the Haitian government, improved quality control and collaboration between industries and laboratories to guarantee a sustainable food control system and the development and dissemination of norms and standard operating procedures for fortification. RANFOSE and its partners will also continue to invest in communication campaigns to raise the population's awareness of the importance of fortified foods to maintain demand and project sustainability towards achieving improved health and nutrition throughout the country.

For more information, please contact RANFOSE at ranfose@gmail.com

³ This latest estimate includes a new company that has been importing fortified oil since November 2020.

⁴ Fonkoze is both a financial service (micro-finance) and a non-profit foundation that provides development services and programmes to support the ultra-poor, working to secure financial and technical support for its Haitian partners. The Fonkoze Foundation is implementing the USAID-funded "AKSYON" project which builds on their network of community health stores to decrease the number of women and children under five years of age who suffer from malnutrition.

⁵ Projet Santé is a USAID-funded project providing integrated maternal and child healthcare, including nutrition services and HIV care, in the hospitals and communities of Haiti.

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Nutrition-sensitive WASH programming to improve the nutritional status of women and children in Nepal

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NEPAL

What we know: Despite plausible linkages between malnutrition and poor water, hygiene and sanitation (WASH) practices and facilities, there is scant documentation to date on the integration of nutrition and WASH programming.

What this article adds: A multi-sector approach is being used by the Suaahara II programme to reduce undernutrition in 42 of Nepal's 77 districts. In line with government priorities to become open defecation free and achieve total sanitation, WASH actions were integrated across Suaahara II districts to develop a conducive environment for improved WASH through the coordination and capacity building of local government stakeholders, better demand and awareness creation for improved WASH facilities and behaviours among households and engagement with private sector actors to strengthen WASH supply chains. Suaahara II prioritises hand washing with soap and water at critical times and the treatment of drinking water which are promoted through multiple behaviour change communication activities. In addition, among the total of 3,353 wards where Suaahara II implements activities, 500 very poor wards were targeted with a package of more intensive WASH-related activities prioritising six WASH behaviours (regular use and cleanliness of toilet, hand washing with soap and water, safe drinking water, menstrual hygiene, food hygiene and peri-home cleanliness). Monitoring data shows the uptake of some promoted WASH behaviours in non-intensive and intensive WASH areas with a greater change over time in intensive areas. Key learnings from the programme include the need to address multiple barriers to behaviour change, to have a multi-level approach, to closely monitor critical indicators and to involve the private sector to address supply barriers.

Background

Nutrition and WASH situation in Nepal

The prevalence of stunting and underweight among children under five years of age have markedly decreased in Nepal over the last 20 years from 57% to 36% and 42% to 27% respectively (MoH Nepal, 2017). Nepal has also made tremendous progress on several key water, sanitation and hygiene (WASH) indicators: basic drinking water services now reach 95% of households and basic sanitation services reach 79% of households (MICS, 2019). However, further improvements are needed. Child undernutrition continues to be a major public health burden and the prevalence of households consuming safe drinking water, hand washing with soap and water at all key times and engaging in other ideal WASH practices remains low. Almost 20% of households do not have a fixed place for hand washing and only 47% of households use soap and water for hand washing (MoH Nepal, 2017). Poor WASH

facilities and practices contribute to sickness and malnutrition; for instance, in a given two-week period, nearly 8% of children under five years of age have diarrhoea (MoH Nepal, 2017).

Although it is well-known that poor WASH practices and facilities are key drivers for diarrhoeal diseases and associated with environmental enteropathy both of which inhibit the absorption and use of calories and nutrients, studies to date including several well-documented trials have shown mixed results of the effect of WASH programming on nutritional status. This is partly because, as trial authors have noted, community coverage of improved sanitation is crucial in addition to household-level behaviours (Pickering et al, 2019). Implementing programmes across levels (household and community) and across sectors (WASH and nutrition), however, remains challenging. For instance, integrated programmes that aim to share new information and change behaviours across multiple sectors can put increased

pressure on staffing, budgets and the focus and time of both frontline workers and households. Furthermore, unless WASH or nutrition indicators are included in project objectives, there is little incentive to work towards an integrated goal (Teague et al, 2014).

Government multi-sector approach

The Government of Nepal (GoN) has prioritised a multi-sector approach to improve the population's nutritional wellbeing. Both the Nepal Health Sector Strategy (2015-2020) and the Multi Sector Nutrition Plan (2012-2022) have emphasised the importance of collaboration with the WASH sector to promote hand washing with soap at critical times, safe drinking water, open defecation free (ODF) communities and water safety plans. Development partners have also aligned with these priorities and multi-sector approaches.

Adoption of the community-led total sanitation (CLTS) approach in Nepal

There has been a major focus in South Asia in recent years on communities becoming ODF primarily using the Community Led Total Sanitation (CLTS) approach. Rather than focus exclusively on toilet construction, the CLTS approach, now used in over 66 nations worldwide, aims to mobilise communities to eliminate open defecation by facilitating their own appraisal and analysis of the situation and taking their own actions to become ODF (Mussembi, 2016). In an evaluation of India's Total Sanitation Campaign, Spears (2012) found that as the programme intensified, infant mortality reduced, eliminating an estimated one-fifth of infant deaths and increasing child height by an estimated 0.2 standard deviations which is similar to the impact of doubling household food consumption per capita.

Following the formulation of the Sanitation and Hygiene Master Plan 2011 in Nepal, within which CLTS principles were central, the adoption of the approach was accelerated across the country. As a result, in 2019, Nepal became the first South Asian nation declared ODF. Nepal has since transitioned to a post-ODF approach focused on total sanitation initiatives. Nepal's 2017 Total Sanitation Guideline has multiple WASH indicators at the household, institutional, market and environmental levels in recognition of the need to streamline and ensure the efficacy of sanitation and hygiene programming (GoN, 2015a). The guideline is based on Nepal's Sanitation and Hygiene Master Plan and was developed for use by government agencies, local bodies, development partners and other WASH stakeholders to aid implementation. Scale-up has been facilitated by the Department of Water Supply and Sewerage Management with budgets and staffing allocated at local government level. This article describes the experiences of integrating WASH programming using a total sanitation approach into a large-scale multi-sector nutrition programme in Nepal in line with government priorities.

Suaahara II integrated nutrition and WASH programming

The Suaahara II programme is a five-year integrated nutrition programme funded by the United States Agency for International Development covering all communities of 42 of Nepal's 77 districts which began in April 2016 as a continuation of the Suaahara programme. Helen Keller International is the lead partner for the programme which is implemented through a consortium with six other organisations. The aim of the programme is to reduce widespread

undernutrition in Nepal, particularly among mothers and children within the first 1,000 days of life, with interventions spanning nutrition, health and family planning,¹ WASH, agriculture and markets and nutrition governance.

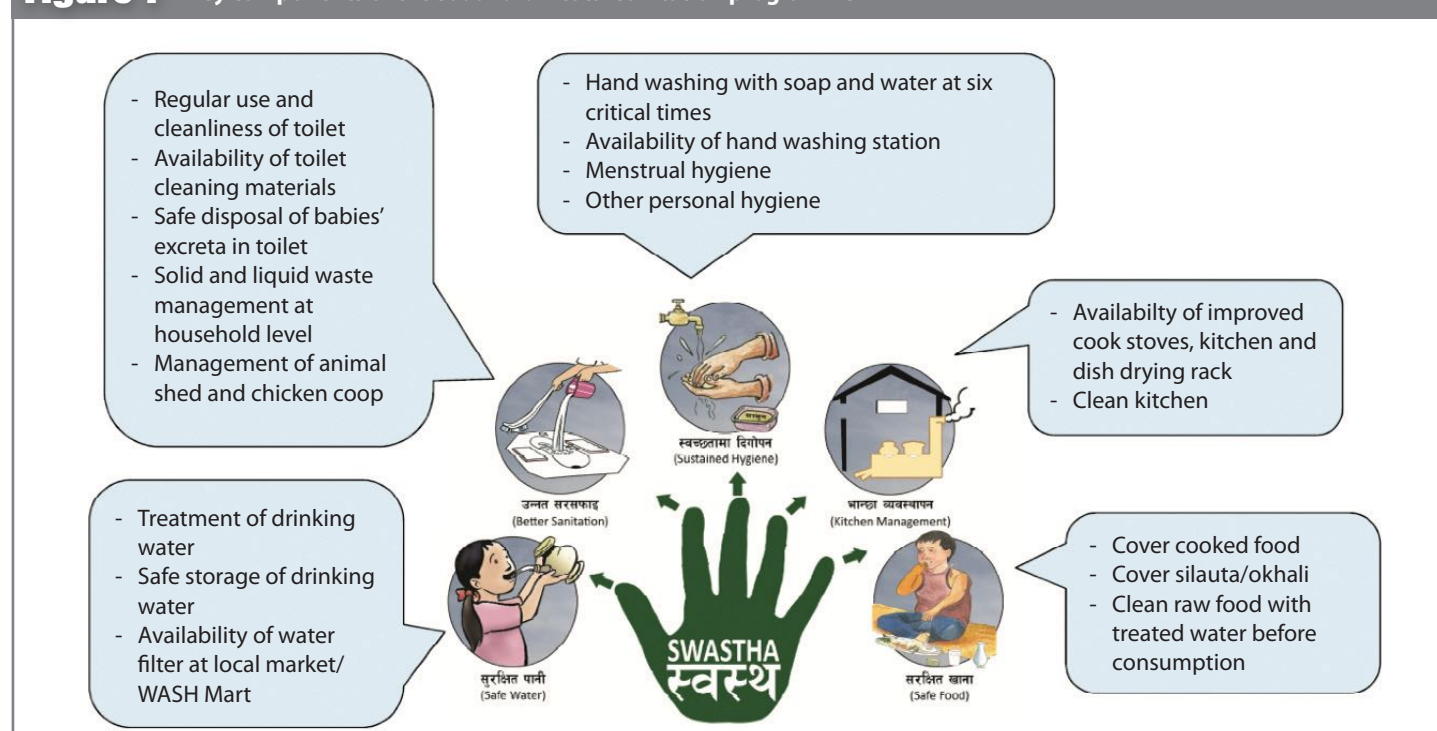
The integrated WASH component of *Suaahara II* initially focused on ODF, in alignment with national priorities and policies, gradually transitioning to a focus on total sanitation initiatives. The focus of WASH programming in *Suaahara II* programme areas is now to develop a conducive environment for total sanitation at the local level through the coordination and capacity building of local government stakeholders, by creating demand and awareness at the household level to improve WASH facilities and behaviours and by strengthening WASH supply chains through engagement with private sector actors. Figure 1 illustrates the key components of the *Suaahara II* total sanitation programme.

Development of a conducive environment

Suaahara II works with all levels of government – federal, provincial, municipal and ward – to provide technical assistance for the development of policies and plans, to implement nutrition-relevant WASH interventions and to advocate for the allocation of resources. To support this, the *Suaahara II* team has provided support to reactivate, and form where not available, WASH Coordination Committees, particularly at municipal level, and to link these with Nutrition and Food Security Steering Committees to support cross-sectoral collaboration for nutrition. *Suaahara II* has also facilitated meetings and led trainings to build the capacity of committee

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

Figure 1 Key components of the *Suaahara II* total sanitation programme



An adolescent girl promoting a reusable sanitary pad prepared by a local tailor in Dhading district, Nepal, 2018

Dipak Raj Sharma/Suaahara II

Table 1 Intervention packages on WASH in intensive and non-intensive WASH communities

Intervention packages intensive WASH communities	Intervention packages in non-intensive WASH communities
Promotion of six different WASH behaviours: regular use and cleanliness of toilet, hand washing with soap and water, safe drinking water, menstrual hygiene, food hygiene and peri-home cleanliness	Promotion of two priority WASH behaviours: hand washing with soap and water and treatment of water before drinking
Additional WASH specific frontline workers provided to each ward to support community interventions	Field supervisors and community nutrition volunteers carry out community interventions
Intensive activities carried out at local government units to attain ODF or total sanitation status.	Provision of technical support to WASH coordination committees or local government for ODF or total sanitation status
Intensive household monitoring and follow-up support visits carried out using devised health home checklists with 22 indicators related to six WASH behaviours	
Establishment of WASH marts to increase access to WASH materials in remote villages	Establishment of WASH marts to increase access to WASH materials in remote villages
Training of local tailors to produce reusable sanitary pads to increase access to menstrual hygiene products	

members around WASH programming at provincial and municipal levels.

In Nepal, nutrition-specific interventions are delivered through the health system. To support total sanitation, WASH messages have been included in training modules for health workers in health facilities and within the maternal, infant and young child nutrition (MIYCN) training for Nepal's female community health volunteers (FCHVs). The purpose of this has been to ensure that frontline health workers reach households with the same messages relating to WASH as well as to maximise contact with individuals at household level. In order to effectively address deficient WASH services in healthcare facilities, *Suaahara II* has integrated WASH into the follow-up support provided to health facilities by *Suaahara II* including technical support to improve WASH facilities and services. Furthermore, FCHVs have been provided with on-site coaching and mentoring support to improve their skills and to ensure that they provide WASH and MIYCN counselling to 1000-days family members through different health platforms.

Household- and community-level interventions

At household level, *Suaahara II* prioritises two WASH behaviours across its entire programme: hand washing with soap and water at critical times and the treatment of drinking water. *Suaahara II* staff employed by local partner organisations in each of the 42 districts implement activities including multiple types of social and behaviour change approaches targeted to households in the 1000-day period (conception until a child reaches two years of age), sharing information and promoting ideal practices spanning health, nutrition, WASH and agriculture. Key behaviour change platforms include home visits, community platforms including monthly health mothers' group meeting discussions, mass media including use of the Bhanchhin Aama radio programme and, more recently, text messages and social media (YouTube and Facebook). Following a campaign by *Suaahara II* to sensitise community members

on the importance of toilet use and ODF status, 11,336 households invested in constructing their own toilets across 35 wards in nine districts.

Suaahara II has a Core+ package of activities which are additional interventions implemented in disadvantaged communities with the aim of closing equity gaps. As part of this package, intensive WASH activities were implemented in programme years one and two. Starting in programme year three, due to resource limitations and a desire to provide higher-quality services for the neediest communities, WASH intensive interventions were focused on selected Core+ areas, identified as the 'poorest of the poor'. In this programme, *Suaahara II* has supported and implemented the intensive WASH total sanitation package in around 500 of its 3,353 programme wards across 42 districts, delivered through an approach known as the healthy home campaign.

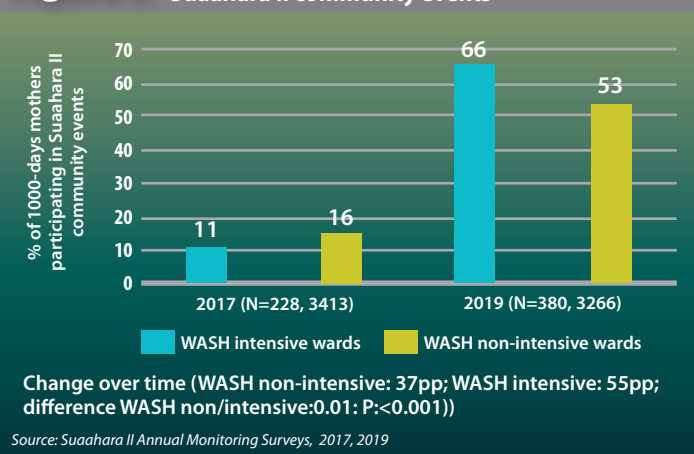
The healthy home campaign includes 22 indicators relating to six different WASH behaviours: regular use and cleanliness of toilet, hand washing with soap and water, safe drinking water, menstrual hygiene, food hygiene and peri-home cleanliness. *Suaahara II* hired additional WASH-specific frontline workers to implement this more intensive WASH package. Along with *Suaahara II*'s other cadres of frontline workers, these staff participated in health mothers' group meetings and other relevant community platforms to spread awareness of the behaviours represented in the 22 indicators. Orientation and sensitisation events were also held in community groups such as water users groups, forest users groups and homestead food production beneficiaries groups. A monitoring checklist was placed in each household to aid regular monitoring and counselling by frontline workers during home visits. Monitoring was carried out jointly by *Suaahara II* frontline workers, community leaders and local health workers to increase ownership of the campaign and help to facilitate community participation in the changes made. A comparison between WASH activities in intensive and non-intensive communities is provided in Table 1.

Suaahara II uses the WASH intensive wards to demonstrate what is possible and to advocate with the GoN for replication of these efforts in more communities of Nepal. Many municipalities have now, for example, taken ownership of the total sanitation campaign and replicated it in other wards with their own human and financial resources.

Private sector engagement to address supply side barriers

To complement demand side interventions, *Suaahara II* also works to address poor WASH product supply chains. *Suaahara II* works with private sector actors to increase access to water filters and other essential WASH commodities, particularly in remote communities, by supporting private sector actors to increase production of WASH products, overcome supply chain gaps and use social marketing to promote uptake of newly available products. To this end, *Suaahara II* has interacted with more than 10 local, national and multinational companies to explore the possibility of collaboration. Although many private sector actors showed interest, it has been difficult to find common benefits and interest. Many national and multinational companies already have their own programmes and local level private sector actors have limited human and financial resources to contribute. Many private companies mainly focus on urban populations whereas *Suaahara II* focuses on improving WASH supplies in remote areas. After much exploration, *Suaahara II* managed to successfully partner with BALTRA, a private multinational company, to increase their reach of water filters into remote communities. *Suaahara II* identified local shops to become 'WASH marts' of which now more than 850 exist across *Suaahara II* districts. This involves linking shop owners to BALTRA dealers to strengthen the supply chain of water filters and other essential WASH materials such as soap, buckets, jugs and toilet cleaning materials to improve household sanitation.

Suaahara II designed an instructional booklet and developed taglines and messages in Nepali

Figure 2 1000-days mothers ever participating in Suaahara II community events

for the promotion and marketing of BALTRA water filters to support this activity. Various communication materials were created with key messages around water filters including posters and stickers and large notice boards for streets, all of which identified the WASH marts so that households knew where they could purchase WASH materials.

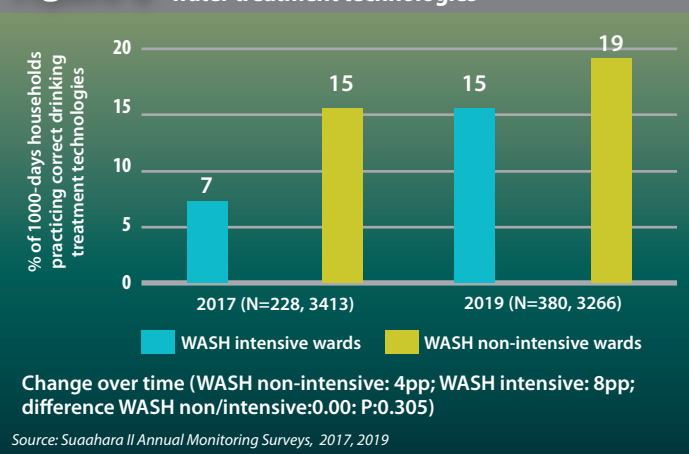
Suaahara II has also supported the social marketing of bio-sand filters, produced by entrepreneurs in the terai (lowland plains), which can remove iron and arsenic from water. Additionally, 1,500 local tailors were trained to produce reusable cotton cloth menstrual pads and about 400 local masons to produce improved cook stoves with lower levels of smoke emission. *Suaahara II* also helped tailors to brand the new reusable sanitary pads as “Sangi Pad” and produced and distributed related posters for social marketing. Priority was given to remote areas where these WASH commodities and services are not available or affordable.

Early results and lessons learned

Data is not yet available to show the impact of *Suaahara II* interventions on WASH outcomes or to link WASH interventions with health and nutrition outcomes. Monitoring data, however, reveals encouraging signs of increased participation in WASH-related activities over time.

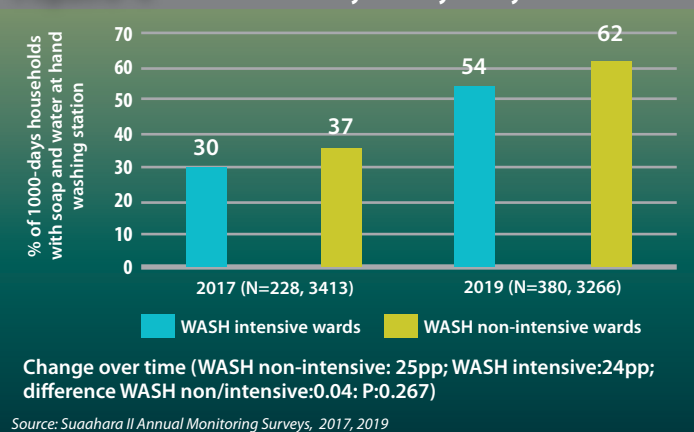
For example, Figure 2 demonstrates a large increase in 1,000 day mothers engaging in community events between 2017 and 2019, both in WASH intensive and non-intensive wards, with a particularly marked increase in WASH-intensive areas. This achievement highlights the benefit of increased programmatic investments and specifically that having more frontline workers facilitates greater intensity of exposure to interventions among target populations. Figures 3 and 4 show that these differences are also reflected in WASH behaviours which improved over time, particularly so in WASH intensive areas compared to WASH non-intensive areas. Qualitative data also shows early signs of the adoption of new behaviours and perceived positive results (Boxes 1 and 2). In time, programme evaluation will capture quantitative data on changes in WASH knowledge, attitudes and behaviours, as well as health and nutrition outcomes.

Implementing this nutrition-sensitive WASH component in the *Suaahara II* programme has led to several important lessons learned. Firstly, improved knowledge and awareness alone often does not result in behaviour change. Systematic efforts are needed to identify and, in turn, address barriers to ideal behaviours including habits, socio-cultural stigma and access to and the affordability of WASH materials and infrastructure. For example, many rural communities

Figure 3 Households practicing correct use of drinking water treatment technologies

lack basic WASH infrastructures such as tap water supply, hand washing stations, chicken coops and animal sheds without which improving WASH and nutrition behaviours are very difficult. Behaviour change therefore requires a more holistic, multi-level approach. In a large, multi-sector programme, identifying and addressing barriers that are different for each behaviour and vary across communities is an immense challenge. In the context of this programme, this required training nearly 40 sub-partner organisations and nearly 2,000 staff to implement activities to improve behaviours across between five and 10 sectors each with between five and 20 behaviours and each with multiple and sometimes conflicting determinants. While the multi-sector nature of large scale programmes like this are key to achieving high impact, their nature magnifies the complexity of truly addressing all key barriers for all key behaviours.

Secondly, developing indicators related to the desired behaviours is necessary to generate programmatic focus on critical WASH behaviours and devoting the necessary time and continuous action. While the list of indicators was long (22), investment was made in various health cadres to enable their implementation. This took initial training, continuous monitoring and follow-up and the involvement of local government to ensure ownership of the campaign. The list of indicators

Figure 4 Households with soap and water at a handwashing station commonly used by family members

Box 1 Quote from a female community health volunteer on the reduction of diarrhoeal disease after healthy home campaign

"Among various changes that the Total Sanitation campaign has brought about, one of them is reduction in the number of diarrhoeal diseases. Before the implementation of the programme, on average, 6-7 people used to come to me every month for ORS [oral rehydration solution]. But now the number has significantly dropped to 1-2 people per month. I think change in the behaviour of hand washing and drinking treated water are the two major reasons for which the trend of diarrhoeal disease has decreased. People have developed the practice of hand washing with soap and water at all critical times. Also all households either boil or filter water prior to drinking. With the gradual change in behaviour of community people, the number of cases of diarrhoeal diseases is decreasing."

Mrs. Urmila Lawati Chemjong
Female community health volunteer, Chilingdin, Panchthar

A 1000-days mother buying a water filter from a WASH mart established through Suaahara II support and facilitation in Western Rukum district, Nepal, 2019



Box 2 Case story: Water filter at wholesale rate for 1000 days mothers

Mr. Keshabraj Belwase is an owner of a utensils shop, 'Namuna Swochataa Pasal', located in Banganga Municipality - 7 of Kapilvastu district where, supported by Suaahara II, he now sells WASH products including water filters at wholesale rate to 1,000 day mothers. Between July 2019 and January 2020, Keshabraj sold 100 water filters (35 to 1,000 day mothers). He has also now begun to sell toilet cleaning brushes, potty pans, buckets, cleaning liquid and other toiletries and sanitation materials to support positive WASH behaviours.

Keshabraj remarked, *"I used to think only health professionals are responsible for betterment of public health. I never had a thought, I, as a local retailer can play a key supporting role to improve family health. Being a local retailer, I can earn profit from other products. Since, it is directly concerned with public health, I am selling the filters in wholesale rate for particular families. Because good deeds are always important for the well-being of community."*

Urmila Chaudhary, a 1,000 day mother from Banganga - 8 said, *"We can get same filter in lesser price in Namuna Swochataa Pasal compared to other shops. It is also easier for us to buy filter there as it is located in the central market. I have bought one filter and have been drinking filter water since then. I am assured that my family are now safe from diarrheal diseases"*.

also set a helpful benchmark to households and motivated them to strive towards achieving them which supported behaviour change.

Another important learning is that it is vital that local governments take the lead for nutrition-sensitive WASH programmes to ensure ownership and sustainability. Their replication of and scaling-up of Suaahara II activities requires building skills and networks for better collaboration between actors in the WASH and health sectors. For sustainability of the programme, Suaahara II has been advocating with the local governments and providing technical support, particularly during their annual planning and budgeting, for nutrition-sensitive WASH investments. Some municipalities have already internalised, replicated and scaled up the healthy home campaign, for instance, integrating the Suaahara II approach. As can be clearly seen in the early results, the WASH-intensive package achieved higher community engagement and behaviour change than the non-intensive package. The adoption of this kind of programme into the government system will require support to local government during annual planning and budgeting, as well as targets set at national level for total sanitation to drive local government. National government should replicate the intensive drive for ODF nationwide, putting similar focus and efforts behind a drive for total sanitation.

Finally, private sector actors are important stakeholders for improving WASH behaviours as they can address supply side barriers. It takes time and compromise, however, to ensure that goals converge and interests align between development objectives and private sector actors. The partnership with BALTRA presented challenges including staff turnover in key positions within the company, a lack of a common understanding for collaboration between BALTRA dealers and Suaahara II field staff and physical challenges to reach geographically remote areas by the dealers. Increased demand for WASH commodities created by development programmes in remote rural areas will facilitate an increased interest by private sector actors to expand their services into these areas in spite of their geographical remoteness. Increased demand and supply must go hand in hand.

Conclusion

Suaahara II integrated WASH activities into its multi-sector nutrition programme prioritising two WASH behaviours, hand washing and drinking water treatment across its entire programme and promoting additional WASH behaviours in WASH-intensive areas. Developing a conducive environment through capacity building and technical assistance for government actors and engagement with the private sector to address supply side barriers were an integral part of this programme. These integrated and intensive programming efforts have shown promising results in the uptake of WASH practices but more evidence on the effectiveness of this approach will emerge from a forthcoming programme-wide evaluation. Scaling up evidence-based, nutrition-sensitive WASH interventions to improve WASH and nutrition indicators requires advocacy and collaboration with government actors at every level. Suaahara II will continue to lobby and advocate for the healthy home campaign to improve WASH behaviours in Nepal.

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Streamlining SMART survey processes in support of a high quality, nationally owned nutrition information system in Kenya

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The authors recognise the leadership and commitment of the Government of Kenya at national and county levels in improving the quality of the Nutrition Information System. In particular, the authors express sincere thanks to Veronica Kirogo, Head Division of Nutrition and Dietetics, Ministry of Health, for her leadership and guidance as well as to the Nutrition Information Technical Working Group (NITWG) members and their respective agencies, including Action Against Hunger Kenya and World Vision for their tenures as NITWG chair. The authors also recognise UNICEF and other partners for the financial support towards integrated SMART surveys and Action Against Hunger Canada which has acted as the SMART Project Convenor since 2009.

The views of Lucy Maina-Gathigi and Kibet Chirchir incorporated in this article are their own and do not necessarily represent the views of UNICEF, its executive directors or the countries that they represent and should not be attributed to them.

KENYA

What we know: Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology is widely used in Kenya by governments and partners, in both arid and semi-arid areas, in nutrition surveillance and early warning systems.

What this article adds: From 2013 onwards, the processes for conducting SMART surveys in Kenya were streamlined, harmonised and institutionalised under the coordination and leadership of the national Nutrition Information Technical Working Group (NITWG). Key actions to streamline processes included the development of guidelines and standard processes, capacity building, the development of task forces, the setting up of systems to validate all survey methods pre-survey and preliminary results post-survey and the management of a common data repository. The result of these actions has been increased capacity among government staff at both national and county level, improved capacity for the coordination of resource mobilisation and joint planning and survey training. Overall results achieved are the greater national ownership of survey management and results (including greater government funding), government-led survey implementation, data that is comparable over time and between geographic areas and the use of data to inform timely nutrition actions as well as to inform other sectors and the overall situation analysis in the country. Key drivers of this success include the commitment to capacitate national staff at all levels, succession planning, consistent stakeholder communication and the availability of complementary data for situations (such as in COVID-19) when SMART surveys could not be undertaken.

Background

Kenya has set out a vision to transform into a globally competitive and prosperous nation with a high quality of life by 2030. Poor health and nutrition status are major setbacks towards realising this vision, with huge disparities in the distribution of malnutrition observed across the country (Figure 1). The nutrition situation quickly deteriorates during drought periods in many parts of Kenya with critical and extremely critical levels of undernutrition regularly recorded in arid counties (Turkana, Mandera, Wajir and parts of Marsabit counties). A national Nutrition Information System (NIS) is critical to providing up to date nutrition surveillance and monitoring information to inform a timely, high quality nutrition response.

Figure 1 Prevalence of wasting in children 6-59 months across the 47 counties in Kenya

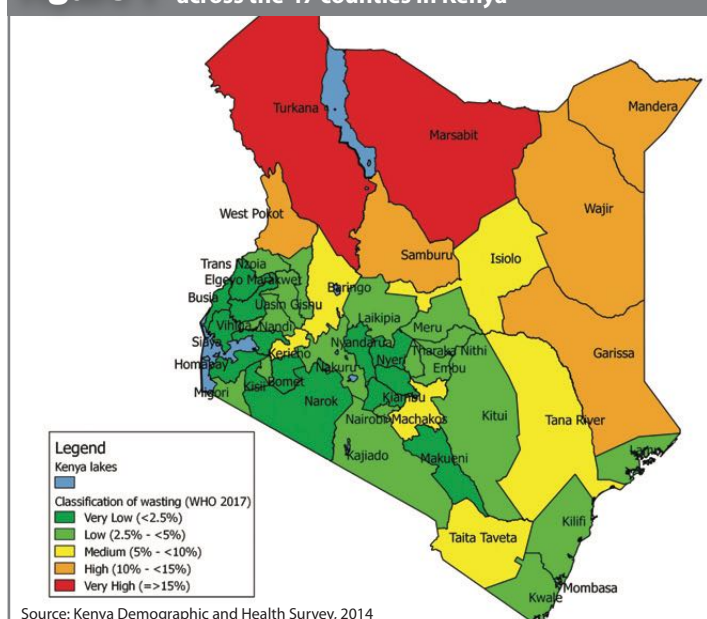
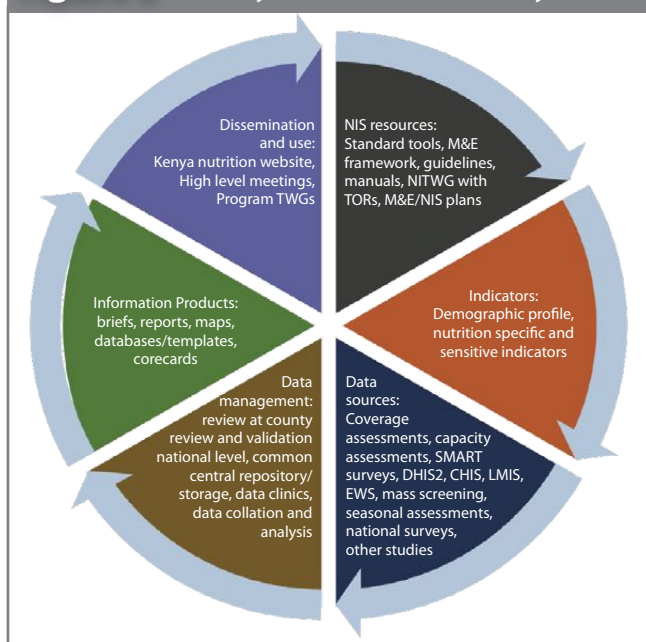


Figure 2 The Kenya Nutrition Information System

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Use of mobile data collection in SMART surveys as opposed to manual data collection: one of the steps taken by NITWG to improve data quality, Baringo County, Kenya, 2015

In recent years, the Kenya NIS has been better defined, as represented in Figure 2 and clear guidelines, tools and standardised methodologies and processes have been developed to support national nutrition monitoring and evaluation. Data sources for key indicators have also been better defined and nutrition Standardized Monitoring and Assessment of Relief and Transitions (SMART) surveys have been identified as the key source of data on the prevalence of acute malnutrition at population level (Box 1).

In Kenya, SMART methodology was first implemented in 2008. Since then, many surveys have been conducted, especially during emergencies, as part of surveillance and to inform

response and, in recent years, in non-emergency contexts. Prior to 2013, surveys were largely financed, technically supported and conducted by international partners, often with the support of international consultants from UNICEF or other implementing partners, with minimum government involvement. This led to a lack of standardisation in processes, methodologies, tools and indicators as consultants and agencies worked with their own interpretations. For example, there was no guidance on the number of indicators to be added to SMART surveys which led to compromised quality of anthropometric data and/or to the collection of indicators without an adequate sample size to inform programming. This article describes the processes undertaken in Kenya to streamline SMART survey² processes to contribute to a high quality, nationally-owned and led NIS.

Establishing mechanisms for coordination and quality assurance

The 2007/2008 emergency situation triggered by the post-election violence (PEV) in Kenya demonstrated a heightened need to better coordinate information systems in order to ensure a more effective response. After reviewing lessons learned from the evaluation of the PEV response, the nutrition sector formed the Kenya Nutrition Technical Forum led by the Ministry of Health (MoH), under which several technical working groups were formed, including the Nutrition Information Technical Working Group (NITWG), set up in 2008. The agreed role of the NITWG was to review and validate data collection methodologies to ensure the availability of timely, quality nutrition information to guide programme response. The functions of the NITWG have since expanded to ensure the establishment and sustainability of a functional NIS through the actualisation of strategic ob-

jectives #9 and #10 of the National Nutrition Action Plan 2012-2017 to strengthen nutrition surveillance, monitoring and evaluation systems and to enhance evidence-based decision-making.³

Due to the varied capacities and skills within the NITWG, different task forces were formed based on the group's needs and in line with its terms of reference including SMART surveys, coverage, infant and young child feeding assessments and routine information task forces among others. The main objectives of the task forces were to fast-track protocol approvals, validate results and build the capacity of the NITWG members and affiliates in each respective area.

Since 2013, the NITWG has carried out annual nutrition 'data clinics' as part of its quality assurance activities. The main objective of these clinics is to critically review all nutrition indicators across every source of nutrition information (SMART surveys, routine health information system, sentinel sites), standardise tools and methods and provide guidance to all key partners and stakeholders. A secondary objective is to strengthen linkages with other working groups to improve data collection, analysis and dissemination, including partners from other sectors (Water, sanitation and hygiene (WASH), food security and health).

Actions to improve SMART surveys

A key function of the NITWG has been to improve the quality of the data collected through SMART surveys across Kenya. To this end, several important actions have happened since 2013 as follows:

¹ <https://smartmethodology.org>

² Additional indicators from other sectors such as food security, health and WASH were added to anthropometry and mortality core indicators

³ Now covered under key result #16 of the Kenya National Nutrition Plan 2018-2022

Box 1 SMART survey methodology

Launched in 2002 by a network of organisations and humanitarian practitioners, SMART survey methodology¹ is widely accepted within the nutrition community for use in all settings (development, emergency, displaced populations) for assessing the prevalence of different types of malnutrition and/or the nutritional impact of a project.

The methodology was originally developed as a tool to improve the monitoring, reporting and evaluation of humanitarian interventions. It has a strong focus on ensuring high quality data by controlling the quality of data collection, entry and analysis. SMART methodology was designed to address issues of common interest to many organisations working in humanitarian assistance including the need to i) standardise survey methodologies among organisations conducting nutrition surveys, ii) strengthen the technical capacity of all partners with user-friendly tools and iii) establish comprehensive, collaborative systems to ensure good quality and reliable data is used for reporting and decision-making.

Table 1 Government SMART survey funding 2018/2019, in Kenyan Shillings (KSh)

Timelines	County	Total cost (KSh)	Government contribution (KSh)	Government contribution (%)
July 2018	Marsabit	6,192,280	974,000	15.7%
July 2018	Wajir	4,200,660	1,796,800	42.8%
July 2019	Garissa	4,697,300	854,700	18%
July 2019	Wajir	2,729,433	1,513,100	55%
July 2019	West Pokot	2,585,550	190,550	7%
July 2019	Turkana	7,894,500	488,500	6%

Mapping partners and needs

The NITWG supported counties to carry out an inventory of NIS related capacity strengthening, support and resource mobilisation actions carried out by partners to enable joint coordination and planning. The NITWG also supported counties to map out surveillance needs, including when and where SMART surveys should be conducted, based on the mapping of seasonality and trend analysis. This resulted in a survey calendar to support better coordination and reduce duplication of partner activity. This process also considered the importance of linking with other sectors and aligning with other key assessments to ensure the optimal use of data, for example to allow the results of SMART surveys to feed into seasonal assessments.

Developing guidelines and standardising processes

To ensure the standardisation of all surveys at the national and county level, guidelines and global standards were adapted and contextualised to the Kenya context. This included the development of standardised versions of the questionnaires (available in different formats to accommodate both paper-based and mobile data collection), survey protocols, preliminary findings and reports. As surveys were implemented by multiple organisations with the support of multiple consultants, it was important to give clear guidance, for example, on the maximum number of indicators to add to the integrated SMART survey questionnaire, and to give a clear definition of each indicator and how to collect against it to avoid individual interpretation of methods. This clear guidance aimed to avoid historical poor practice, for example, one 2012 multi-sector survey included 130 questions leading to survey team and respondent fatigue, thereby compromising the data quality against core nutrition indicators. The NITWG team also developed templates for reporting preliminary results to guide stakeholders and to ensure that results were submitted for validation in standard formats.

Capacity building activities

Training on SMART surveys was carried out in 2014 and 2015 with support from the UNICEF regional office. A cascade approach was used to reach the field level government staff implementing surveys with a focus on the ASAL areas. This ensured the standardisation of meth-

ods used. As an example, Turkana county authorities initiated a targeted county level training that focused on government and partner staff directly involved in the implementation of a planned survey, thus giving trainees theoretical knowledge as well as practical experience.

Validating survey methods and results

To ensure the quality and standardisation of nutrition surveys, the NITWG has also put in place a system to review and approve survey methodologies ahead of survey implementation. This applies to all surveys and must be done before any fieldwork begins. It includes a review of the survey's objectives, rationale, methodology, training plans (days, venue, topics, facilitators), data collection tools and analysis plans. After survey implementation, the survey report with the preliminary results must be submitted by the survey coordinator to the NITWG with a plausibility report attached. The NITWG then provides a final validation of the results after a thorough review of the data and final survey report. To be considered of good quality, the survey plausibility check report must show that data is of good quality, i.e., all criteria from the plausibility check report are within acceptable values,⁴ the sample size is above 80% of target children and the number of clusters included should be above 90% to ensure that the results are of high quality before being shared. This quality assurance process was previously completed by partner staff and consultants. To strengthen national capacity and ensure sustainability, this process is now conducted by officers from the MoH.

Management of a common repository

The absence of a data repository in the past made it difficult to access raw data from consultants and individual agencies and made it impossible to provide oversight on data quality. The NITWG agreed to have a common repository of raw datasets which include Emergency Nutrition Assessment files, questionnaires, methodologies and reports in both Word and PDF. After the NITWG has approved them, all survey reports are uploaded on a nutrition website managed by the government.⁵ The dissemination of findings through this website and survey dashboard allows access to information for any validated nutrition surveys in the country by all interested parties, allowing for real time programming and decision-making.

Achievements

Increased government funding to conduct SMART surveys

Following the actions described, the processes relating to SMART surveys are now clearer, resource mobilisation efforts are better coordinated and there is no more duplication. Stemming from an overall effort to increase capacity and ownership, the Government of Kenya has also significantly increased its financial investment in surveys over the years. County governments are now directly investing funds and leading on the mobilisation of funds for surveys as part of their annual plans. Table 1 reflects the investment made in surveys by the Government of Kenya in 2018 and 2019. While in some counties percentage contributions are still low, the actual financial commitment made has increased from previous years.

Government-led survey implementation

The streamlining of processes has resulted in increased capacity among government staff at both national and county level including better capacity for the coordination of resource mobilisation, joint planning, survey trainings and implementation. This has resulted in greater government ownership of survey management and results. Government staff at county level are also now leading surveys with minimal external support. This includes overall survey management, coordination, protocol development, presentation for validation, training, data collection, analysis, reporting and dissemination.

Timely preparedness and response

The availability of SMART survey data has allowed the early detection of a deteriorating situation in the country to prompt an early response. For example, in 2017, as a result of the nutrition analysis conducted in August 2016, the nutrition response action began even before the drought was officially declared. The Government of Kenya was therefore able to anticipate needs and allocated USD7,540,000 to the nutrition response.

Comparability over time and space

Because processes and field procedures are standardised, data generated over time is now comparable. SMART surveys for every survey zone are consistently conducted during a specific season, indicating when a situation is improving or deteriorating. As an example, Figure 3 illustrates the changes in acute malnutrition over time per survey zone in Turkana County where nutrition surveys are conducted annually towards the end of the long rains in the month of June. These survey results also feed into the 'long rains assessments' conducted biannually (in June and in February towards the end of the short rains). Persistently high global acute malnutrition / levels (exceeding the World Health

⁴ Those criteria are: % flagged data, sex ratio, age distribution, digit preference for anthropometric measures, standard deviation of WHZ, shape of the distribution (skewness/kurtosis/index of dispersion)

⁵ <http://www.nutritionhealth.or.ke/>

Organization emergency threshold of 15%) in the past decade highlight no obvious recovery from the persistent shocks from drought, floods and conflict facing the community living in the county. Figure 3 also displays the similarity of the two episodes of drought that Kenya experienced in 2011 and 2017

Quality data is available and used

Before surveys were coordinated and regulated, survey reports would be shared without an indication of data quality. Since estimating data quality is now a key requirement for any survey to be validated, the vast majority of surveys currently conducted in Kenya demonstrate the highest level of rigour, reliability and quality, therefore making Kenya a 'centre of excellence' on NIS. This has led to stronger collaborations beyond nutrition survey planning. For instance, the NITWG was engaged for the first time in the Kenya Demographic Health Survey in 2014 and provided support conducting the standardisation test, a technique from SMART methodology that consists of ensuring high data quality for anthropometric measurements.

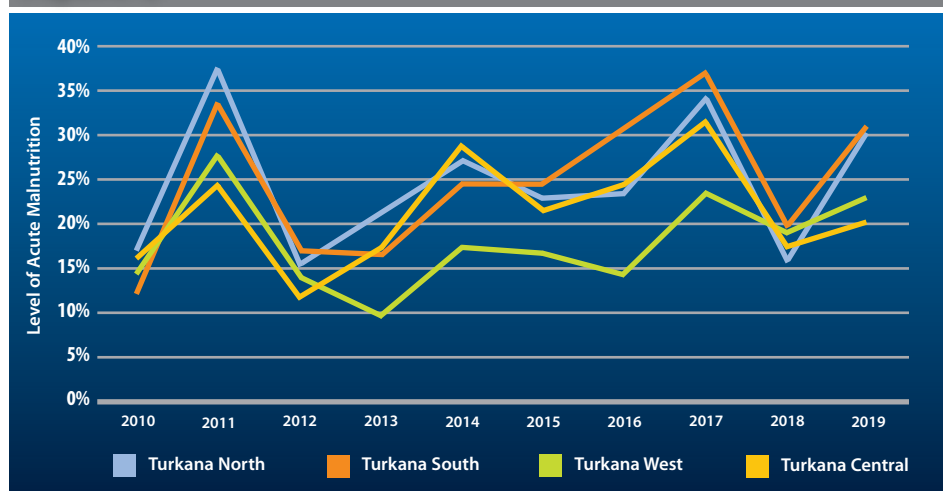
To ensure that SMART survey results contribute comprehensively to situation analysis in Kenya (such as the integrated phase classification (IPC)), multiple sectors (food security, health and WASH) were consulted to identify key indicators to be systematically included in the standard nutrition surveys. SMART surveys are therefore now considered a reliable/valid source of data by other sectors and the nutrition sector is now perceived as the most coordinated sector from which up to date information is always available. This has raised the profile of the nutrition sector and provided a space for multi-sector engagement. The counties also use SMART survey data for baseline and planning information when developing County Integrated Development Plans⁶ and County Nutrition Work Plans.

Lessons learned

Investment in a government owned and sustained monitoring and evaluation framework for nutrition has formed the backbone of the now high-quality NIS infrastructure in Kenya, contributing to key result #16 of the Kenya Nutrition Action Plan. NIS standardised tools and methodologies have served to streamline capacity-building efforts and have allowed for comparability of results over time which was not previously possible.

Although high staff turnover has proved to be challenging, training government staff has enabled the NITWG to retain a pool of technical staff who are able to pass on knowledge to new entrants. The formation of task forces, including a SMART survey task force, has improved turnaround time, allowed deeper interrogation of methods, processes and procedures and has enabled targeted support where needed. Task forces also include members who have transitioned from NITWG and are now engaged as international experts on SMART surveys, many of whom remain engaged and able to provide technical support to the team when called upon via

Figure 3 Trends in global acute malnutrition in Turkana county (SMART Surveys 2010-2019)



WhatsApp groups, by reviewing documents online and even volunteering to provide support during contract breaks.

A core mandate of the NITWG is to ensure succession planning and mentorship. The support, mentoring and coaching of new NITWG members/teams through the documentation and sharing of lessons learned have allowed new entrants to continue to build on what has gone on before. Over the years, the forum has remained vibrant and, as a result, this has ensured that a high level of expertise and capacity remain in the country.

Consistency is key. Since 2013, NITWG meetings have been held on the last Thursday of every month. This schedule has not changed despite many competing priorities such as the biannual IPC analysis that mostly happens towards the end of the month. The country has continued to hold virtual meetings consistently during this current COVID-19 pandemic period, making it easier for members to plan and block dates and for the planners to organise the meetings in advance. Teams that are planning to have surveys and protocols validated can easily fit into this schedule.

System wide capacity building is critical. Focusing on government staff capacity building helped to strengthen the ownership of processes while the standardisation of tools and methodologies enabled uniformity, data availability and quality. Leadership and ownership by government and the institutionalisation of processes has assured better results, ownership of the products and sustainable strategies. It is therefore important to continue efforts to maintain high quality data. This can be achieved through scheduled data clinics and coordinated survey implementation. It is also crucial to continue capacity support especially to government officials from counties that are not considered to be arid nor semi-arid areas. Engaging them during SMART training, survey implementation, data clinics, IPC analysis, NITWG meetings and any other NIS learning events are ways to keep them engaged and updated.

Kenya has multiple sources of information that complement each other. Besides SMART surveys, an early warning system is run by the National Drought and Management Authority and routine information is generated by the MoH. These sources provide data that can generate trend analysis over time to complement SMART survey results, ensuring no data gaps. Even during the COVID-19 pandemic when SMART surveys were halted, Kenya was still able to conduct IPC-acute malnutrition analysis due to the availability of these other sources of data.

Conclusions

Overall, the Kenya NIS has benefitted from having a clear monitoring and evaluation framework and well-defined coordination and quality control bodies. Key actions to improve SMART survey data quality included the streamlining of data collection methodologies, the capacity building of government and partner staff, the setting up of task forces, validating all survey methods and results and managing a common data repository. From our experience, the key ingredients for other countries to consider for a sustainable NIS include strengthening the capacity of government staff, succession planning and mentorship, coordinating efforts and resources and maintaining high standards and quality control frameworks. The COVID-19 pandemic affected NIS, just like all sectors, due to the cessation of all household surveys, including SMART surveys, for 2020. Availability of complementary data sources ensured continuity of information in the face of this unforeseen gap in the availability of survey data. This experience provides useful insights for other countries looking to enhance the use of SMART survey methodologies, and indeed other forms of nutrition surveillance, to contribute to a high quality, nationally owned NIS.

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⁶ A CIDP is a plan prepared by all counties to guide development over a five-year period.

Remote Integrated Phase Classification during the COVID-19 pandemic: experiences from Madagascar

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of UNICEF or the IPC.



A child has her arm measured to screen for wasting in Southern Madagascar, 2020

MADAGASCAR

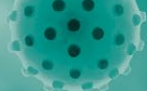
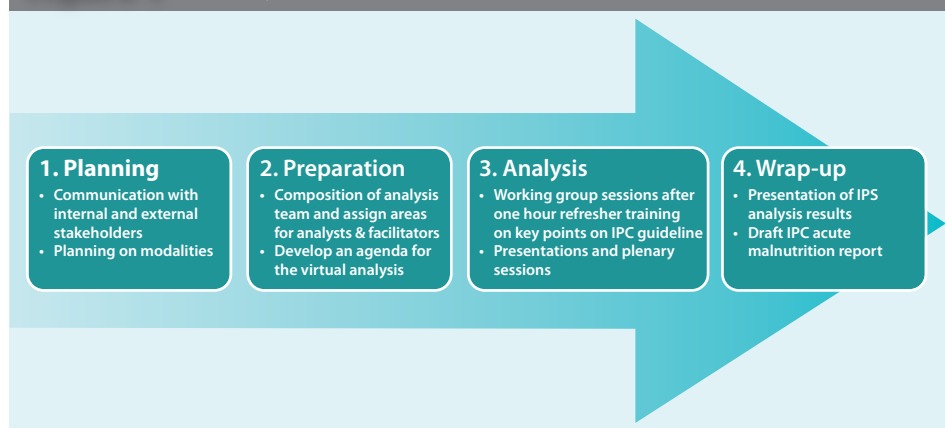
What we know: The Integrated food security Phase Classification (IPC) provides information to decision makers to address food insecurity; COVID-19 related movement restrictions meant that normal IPC methods could not be used.

What this article adds: In May 2020, the Madagascar Ministry of Health, UNICEF and other nutrition partners, together with the IPC Global Support Unit (GSU), leveraged existing technologies to conduct a virtual IPC analysis for acute malnutrition in six drought-prone southern districts in Madagascar. Adaptations made to the IPC methodology for the COVID-19 context featured the inclusion of already trained team members to reduce the length of orientation, utilisation and re-analysis of data collected just prior to lockdown to overcome challenges in data collection and the shifting of meetings from in-person to virtual. A number of assumptions were built into the analysis given the COVID-19 context including the likely negative impact on food systems and access to health services in the post-harvest period. Results of the analysis hypothesised the likely deterioration of the nutrition situation in all six districts beyond August 2020 with two districts being classified as IPC phase 3 or 4. The IPC analysis was largely deemed a success as a result of strong political will and support from nutrition partners and the IPC GSU. However, numerous challenges were noted including a reliance on historical data, a lack of global guidelines on remote facilitation at the time and internet connectivity challenges.

Background

The Integrated food security Phase Classification (IPC) is a widely accepted mechanism for improving food security and nutrition analysis and decision making (<http://www.ipcinfo.org/>). Originally developed in 2004 in Somalia by the Food and Agriculture Organization's Food Security and Nutrition Analysis Unit (FSNAU), IPC has evolved over time and currently includes a range of classification scales, namely Acute Food Insecurity (IPC-AFI), Chronic Food Insecurity (IPC-CFI) and Acute Malnutrition (IPC-AMN) with each scale informing specific types of action needed to address food insecurity and malnutrition (IPC, 2019). IPC results inform humanitarian response planning and are the main source of data for the Global Food Crisis Report.¹ The IPC-AMN analysis provides decision-makers with key information

¹ <https://www.wfp.org/publications/2020-global-report-food-crises>


Figure 1 IPC analysis for acute malnutrition


to support activities that aim to decrease the prevalence of acute malnutrition. Specifically, it provides guidelines for the classification of areas in terms of the prevalence of global acute malnutrition (GAM) (thresholds for weight-for-height z-score (WHZ) and mid-upper arm circumference (MUAC)), estimations of the numbers of acutely malnourished children (by WHZ, MUAC and/or both), classifications of geographical areas in terms of severity of acute malnutrition and the identification of the key drivers of acute malnutrition.

The general approach for conducting IPC analysis is for stakeholders at national-level to gather primary and secondary data on food security and nutrition, after which they converge to discuss the results, facilitated by and together with technical support from IPC experts. However, this approach has not been feasible in many contexts since the outbreak of the COVID-19 pandemic due to restrictions on travel and gatherings which, at the same time, have resulted in widespread increases in food insecurity due to reduced livelihood activities and household incomes and disrupted supply chains. Four days after Madagascar first reported a case of COVID-19, in March 2020, the country was put on total national lockdown which included a ban on all regional and international travel and a total shut down of all non-essential activities in the cities of Antananarivo and Toamasina. It was therefore critical to find possible ways to understand the food security and acute malnutrition situation within this novel context.

The 10 southern-most drought-prone districts in the Greater South (Grande Sud) of Madagascar have historically had chronically high levels of both stunting (classified as very high at above 30%) and wasting (GAM levels classified as medium-high nationally at 5–10%, with some districts reaching 10–15%) (MICS, 2018). Given the chronic nature of nutrition vulnerability of populations in the southern parts of Madagascar, the Ministry of Health (MoH) and nutrition partners, including UNICEF, and together with the IPC Global Support Unit (GSU), leveraged existing technologies to conduct a virtual IPC analysis for

acute malnutrition (IPC-AMN) for six districts of the Greater South in May 2020 (these six districts out of the 10 districts in the region were selected based on the level of data availability). This article highlights how the IPC-AMN analysis was conducted virtually in order to obtain an understanding of the level of malnutrition in the Greater South region of Madagascar.

The approach

A four-stage approach was followed as described in Figure 1² with each stage described below.

Stage One: Planning

Typically each year, a planning exercise is conducted between country IPC Technical Working Groups (IPC-TWG) and the IPC GSU in order to determine the number and timing of IPC analyses for the year. This planning meeting took place towards the end of 2019 between Madagascar's IPC-TWG and the Nutrition Cluster, after which it was agreed that an analysis would be conducted in October of 2020. Due to COVID-19, the planning was rapidly adjusted at the request of the Nutrition Cluster and the MoH to enable an analysis of the nutrition situation in districts affected by drought. The virtual methodology was jointly proposed by UNICEF and the IPC GSU and approved by the country IPC-TWG. This was the first time that such an approach had been piloted globally.

Under normal circumstances, IPC analysis usually takes 10 days (including four days of training at the beginning). To shorten the process, previously trained and certified participants were selected to make up the team which reduced the length of the process by four days. This was helpful to ensure that the participants remained motivated and committed during the analysis while using virtual means of communication.

Stage two: Preparation for analysis

A country core group, comprised of one IPC-GSU focal point and four national staff as part of the national IPC-TWG (representatives from MoH, the National Nutrition Office, UNICEF and the National Office of Disaster and Risk Management), prepared relevant tools, data and indicators for analysis. This group met three

times virtually using Zoom with technical and financial support from UNICEF. Data was collated on the immediate and underlying causes of malnutrition including population prevalence of key diseases, food security and dietary intake. Survey data for the period February to April 2020 was available for the six selected districts of the Greater South. For three of the six districts, existing data collected just prior to the lockdown was available from a national survey on women's nutrition and vitamin A coverage from February to March 2020. This data was re-analysed to calculate GAM rates. Data for the remaining three districts was directly available.

Data was projected for May to August 2020 and September to December 2020 based on IPC guidelines (IPC, 2019) using historical data on outcome indicators and trend data on contributing factors derived from the national health management information system (HMIS) and other sources. All projections were informed by assumptions based on the IPC GSU guidance note on developing assumptions for projection analysis in the context of COVID-19 (IPC, 2020). Other indicators were drawn from district-level surveys, food security assessment reports, disease trends provided by the Demographic and Health Information Software II (DHIS-2), coverage survey reports, SMART surveys and Link Nutrition Causal Analysis (Link NCA) surveys conducted over the last three years.

The likely impact of COVID-19 on acute malnutrition was also considered, drawing from IPC GUS technical guidance (IPC, 2020). Pathways for impact were explored including the likely negative impact on food systems and access to health services in the post-harvest period. The tools, data and indicators were subsequently made available online for the working groups during the analysis.

Composition of analysis team

The virtual IPC-AMN analysis team included 23 participants, comprising 18 locally based partners³ and five external IPC experts including four Cross Country Learning Exchange (CCLE) participants (from the Ministries of Health in Burkina Faso and Niger, UNICEF West and Central Africa Office (WCARO) and CILSS⁴) and an IPC-GSU focal person based in Rome. The 18 locally based participants formed the group that usually participated in IPC-analyses in-country, however there was more external participation (CCLE participants) in this analysis to support the virtual methodology used. The four CCLE participants shared their experiences

² This follows the normal historical process for conducting IPCs in Madagascar but was held online, and therefore the duration was shorter and there was no in-person training.

³ These 18 participants included 10 ten nutrition and health focal points from districts level government, central MoH and Action Contre la Faim (ACF), four food security focal points from FAO, WFP, three wash and social protection focal points from ACF and CARE International and one disaster risk management focal point.

⁴ CILSS = le Comité permanent inter-États de lutte contre la sécheresse dans le Sahel (Permanent Inter-state Committee for drought control in the Sahel)

Box 1 IPC-AMN analysis steps

Step 1: Context and analysis parameters

Step 2: References for evidence

Step 3: Analysis outcomes

Step 4: Analysis of evidence on contributing factors and other issues

Step 5: Phase classification

Step 6: Key drivers

Step 7: Limitations of analysis

Step 8: Priority response objectives

Analysis of evidence on contributing factors and other issues

Analysis of outcomes

Risk factors to monitor

on nutrition indicators and virtual analysis and learned from Madagascar's experience. Commitment was given from each of the member organisations to fully attend the entire virtual process.

At the start of the virtual sessions, participants were assigned to one of six working groups each focusing on one of the districts, ensuring a spread of technical expertise and organisational affiliation. Each working group was led by a focal person from a different organisation including Action Contre la Faim (ACF), CARE International, the Food and Agriculture Organization (FAO), MoH, the National Nutrition Office under the Prime Minister's Office (ONN), the National Office of Disaster and Risk Management (BNGRC) and UNICEF. A local country facilitation team was comprised of three experts to oversee the working groups which were comprised of national experts experienced in IPC methodology with extensive knowledge of the local context (from BNGRC, MoH and UNICEF). The IPC-GSU also provided two facilitators from its pool of global and regional experts. At different stages of the analysis, focal persons from each of the six districts were consulted for knowledge of the local context. Support to district-level participants in the form of data bundles was provided to facilitate internet access and participation in online sessions.

Figure 2 IPC-AMN Madagascar key results, June 2020

KEY FIGURES	FEBRUARY - DECEMBER 2020	
 119,674 the number of 6-59 months children acutely malnourished IN NEED OF TREATMENT	Severe Acute Malnutrition (SAM)	19,554
	Moderate Acute Malnutrition (MAM)	100,120
	Global Acute Malnutrition (GAM)	119,674

Stage three: analysis

Under normal circumstances, IPC analysis is conducted with a group of three to four persons per district (or unit of analysis). Groups usually travel to one location for the analysis and remain together for the duration of the training and analysis. There is a designated facilitator for each group to assist with technical questions, monitor the progress and act as spokesperson to IPC technical leads and documents are shared via USB flash drives. For the virtual process, a similar process was used but working group sessions were conducted virtually (using Skype and Zoom), administered by BNGRC (supported by the provision of data bundles for each participant) and files were shared using Dropbox. The MoH provided participants with full online access to the country's HMIS and nutrition-related indicators. UNICEF and the IPC-GSU focal person, as technical leads, created and sent out calendar invitations to participants and meeting reminders 30 minutes prior to each session.

The participants of each working group spent about three to four hours in working sessions on Skype each day. Working groups made their own arrangements with their group facilitator on how to complete assigned activities which typically included two to three IPC-AMN steps per day out of the total eleven IPC-AMN analysis steps (Box 1). The most common arrangement was that participants took turns to take breaks when needed while the other participants continued to work.

There was a one-hour lunch break every day followed by a Zoom plenary session for all the working groups, during which the group's designated rapporteur presented on the working

groups' deliberations and conclusions for validation within the wider group.

Stage four: Wrap-up

The results of all the group analysis per district were validated in plenary sessions after which they were presented to the national Nutrition Cluster by the chair of the country IPC-TWG for clearance. This was a similar process to a typical IPC analysis, although validation took place online. The analysis team finalised the IPC report according to IPC guidelines and this was then presented virtually to the cluster after which comments and feedback were integrated into the report before submission to the IPC-GSU for review. The final version was then officially released by BNGRC.

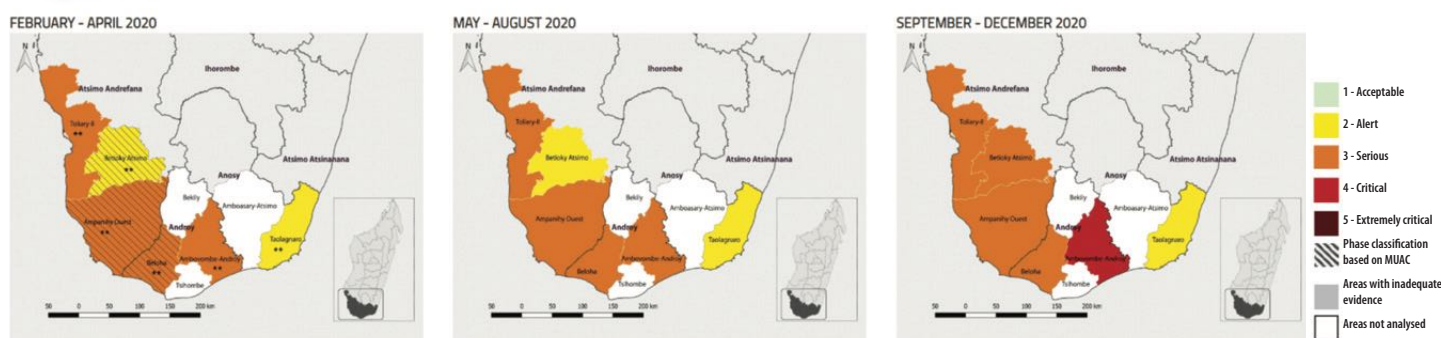
Results

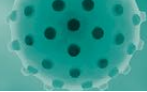
The results of the Madagascar IPC-AMN analysis estimated GAM prevalence to be between 10.5-16.8%, severe acute malnutrition (SAM) prevalence was estimated to be between 1.6-3.7% and moderate acute malnutrition (MAM) was calculated to be between 9.0-14.4%.⁵ Based on these estimates, it was calculated that 119,674 children 6-59 months of age would need treatment for acute malnutrition between February and December 2020 (Figure 2). Out of these, 16% would need treatment for SAM.

Results estimated that the nutrition situation would likely deteriorate in all six districts beyond August 2020 due to the agricultural lean season and the effects of COVID-19 (Figure 3). Such factors were expected to result in a

⁵ Note this is a combined prevalence estimate, i.e., according to weight for height and/or mid-upper arm circumference and/or oedema presence anthropometric indicators.

Figure 3 IPC AMN results maps. The full report can be accessed on the IPC website [here](https://www.ipc-ngi.org/)





slight deterioration in four districts (Toliary-II, Ampanihy, Beloha and Tolagnaro) without changing their global classification of IPC Phase 3 – 'serious'. However, results estimated that Betioky district would likely move into the serious phase category (IPC Phase 3) and Ambovombe district into the 'critical' phase (IPC Phase 4) requiring special attention and an urgent and targeted response. Full results are provided in the report.⁶

Discussion

Key success factors

The IPC-AMN team in Madagascar leveraged existing local opportunities and prevailing political will to organise a virtual IPC-AMN analysis, the first remote IPC acute malnutrition analysis conducted globally. Key success factors were a dynamic and motivated country team, openness, the willingness and participation of national and district level representatives of three key government institutions (the National Nutrition Office, the BNGRC and the MoH) and full sharing of the national HMIS platform. In addition, the IPC team enjoyed a healthy working relationship with the food security, social protection, WASH and health clusters which enabled the sharing of important contextual information. Another key factor was the technical support provided by the IPC GSU and IPC CCLE participants who were able to participate remotely from Niger, Burkina Faso and Rome. Overall, the use of virtual meeting methods enabled the participation of a high calibre of local and international experts that allowed a high-quality process in line with IPC guidelines.

Data collected via a national nutrition survey just prior to the lockdown that included anthropometric data was available and helped form a reliable basis for the baseline IPC projections. While the nutrition assessment was not directly representative of each unit of analysis, it was possible to re-calculate nutrition outcomes per unit of analysis informed by IPC-GUS guidance. This was important as it allowed for the use of recently collected, existing data to ensure a robust and credible analysis. Projections from this analysis have proved to be accurate, as Southern Madagascar is now facing great increases in levels of child wasting across the region.⁷

Challenges

Organising an IPC-AMN analysis exercise without up-to-date nutrition survey data seemed, at first, to be a daunting task and required additional work to recalculate available data. The fact that recent data was only available for three districts was problematic and required strong statistical capacity within the country core team to perform appropriate recalculations of all nutrition indicators at district level before the data could be integrated into the analysis. The most recent IPC Technical Manual supported this process.

As this was the first remote IPC-AMN analysis conducted during the pandemic, there were no existing global guidelines to support remote facilitation; the in-country team therefore had to develop their own ways of working. The team faced difficulties coordinating the facilitation of plenary sessions and supervising working groups in a way that would ensure rich discussion and debate between participants. As noted previously, keeping participants engaged and committed for many hours per day was not easy. To overcome this, plenary sessions were limited to just one hour a day and the process was kept to no longer than five hours per day. These challenges were further overcome by ensuring an adequate number of experienced IPC facilitators. Internet connectivity was a notable challenge throughout which, at times, led to reduced engagement by district-level participants. This was addressed by providing internet bundles to participants which to some extent helped to overcome the issue.

Another challenge was that, at the time of planning the IPC-AMN analysis, there was a limited understanding of the potential impact of COVID-19 on malnutrition estimates and a lack of clarity on how to develop appropriate hypotheses. This was overcome through technical guidance provided by the IPC-GSU focal point, drawing from the latest IPC technical guidance, although there remained many unknowns due to the evolving nature of the pandemic.

Lessons learned

This experience has provided rich learning. Specific lessons learnt include the following:

- Planning and preparation of a virtual IPC analysis requires sufficient time – at least seven days prior to the intended start date. This is more than is typical during a face-to-face analysis and is required to ensure the availability of as much necessary data and information as possible for the working groups to enable them to carry out the analysis in a shorter time frame.
- It is possible, despite the challenges, to use existing available data with re-analysis to the relevant level of unit of analysis. This process, however, requires a high level of technical support for the statistical analysis and additional time to recalculate nutrition indicators.
- The use of team members previously trained in IPC analysis saves time and ensures quality input for the analysis. If this is not possible, an online training could be carried out to build the capacity of less experienced participants prior to the analysis, however, this would considerably lengthen the time taken for necessary online engagement which should be taken into account.
- Optimising the capabilities of video-conferencing solutions for working group interactions, discussions and plenary presentations kept participants engaged throughout the exercise.

- If there is poor internet connectivity, a virtual IPC analysis may lead to decreased participation of key authorities and partners at decentralised levels. It is, however, vital to include district level participants to ensure inclusion of deeper insights and knowledge of the areas under analysis. Provision of adequate internet bundles can help to support participation of all partners.
- High quality online facilitation is needed to ensure good participation from all group members, in particular ensuring that every participant has a chance to contribute. For this, the use of all the features of the online tools was helpful including screen sharing and the use of breakout rooms with facilitators moving between rooms.

Conclusion

The lessons learnt through this exercise have shown that, with good levels of supervision and with support to facilitate internet connectivity, it is possible to carry out high-quality IPC-AMN analyses remotely in the context of Madagascar. Adapting to carry out this process remotely was critical to ensure the continuity of IPC-AMN analyses in the context of a national lockdown prompted by COVID-19. The results accurately predicted a decline in the nutrition situation and informed a national-level nutrition response. The results of the initial virtual IPC-AMN analysis were presented at UNICEF's East and Southern Africa regional meeting in June 2020 as a successful example of continuity of activities despite COVID-19 for other countries to learn from and replicate. Since this presentation, another online exercise was carried out in November 2020 in Madagascar and the experience was also replicated in Uganda, Chad, Kenya, Somalia, Burundi and Yemen.

⁶ <https://www.wfp.org/publications/2020-global-report-food-crises>

⁷ <https://reliefweb.int/report/madagascar/madagascar-deterioration-humanitarian-crisis-grand-sud-dg-echo-wfp-unicef-fao-echo>

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Fabiola Niyonkuru feeds her 2-year-old daughter, Diella, a healthy diet

A risk communication and community engagement (RCCE) response to support maternal, infant and young child nutrition in the context of COVID-19 in Rwanda

By Annet Birungi, Ken Limwame, Desire Rwodzi and Youssouf Koita



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RWANDA

What we know: Risk communication and community engagement (RCCE) is essential to ensure the continuity of uptake of nutrition services and optimal infant and young child feeding practices in the context of COVID-19.

What this article adds: In Rwanda, two sub-committees were established within the Nutrition Sector to lead nutrition-related RCCE activities, building on a previous national RCCE strategy developed as part of Ebola preparedness efforts. Nutrition-related RCCE needs were identified through a review of existing data from available government reports and mainstream media and social media reports and in consultation with Nutrition Sector partners through the sub-committees. Related key messages to address myths and misconceptions were subsequently developed. Capacity strengthening and training activities for community health workers leading on RCCE activities were conducted via Zoom, WhatsApp, email and telephonically. Key messages were disseminated through print and electronic media channels as well as via community radio stations. Parliamentarians were also engaged to expand the reach of messages. Measuring the impact of RCCE activities has been challenging although changes in practices were monitored through social media and community-level monitoring systems and the uptake of services was measured through routine indicator tracking. Increases in service uptake were noted and positive behaviour changes were reflected within feedback mechanisms. As a next step, the Government of Rwanda intends to conduct a rapid qualitative and quantitative assessment to further understand the impact of RCCE nutrition-related activities.

Background

At the onset of the COVID-19 outbreak in early March 2020, the Government of Rwanda, with support from UNICEF and other United Nations agencies and development partners, established the National COVID-19 Joint Task Force. The task force, led by the Ministry of Health (MoH) and the Rwanda Biomedical Centre (RBC), was vital to inform the national COVID-19 response and implemented a number of key measures to mitigate and manage the pandemic.

One such measure, following a directive from the MoH, was that nutrition interventions at community-level were instructed to continue. To inform this, clear guidelines were issued by the

MoH on nutrition programme adaptations. The guidelines provided a list of nutrition activities and measures to be taken to ensure safe service provision as well as to reduce risks as far as possible to community health workers (CHWs), government and partner staff. These measures enabled the continuity of growth monitoring services including routine screening for malnutrition, the admission and treatment of children suffering from severe acute malnutrition (SAM) and broader maternal, infant and young child nutrition (MIY-CN) activities such as counselling on appropriate complementary feeding and exclusive breastfeeding. Maternal nutrition, infant and young child feeding (IYCF) and food safety and hygiene messages were also integrated into the Standard Operating

Box 1 **Headline findings of the nutrition RCCE review**

The review identified evidence of the following concerns to be addressed through RCCE activities:

- Existence of myths and misconceptions around the prevention and spread of COVID-19 with some likening the disease to Ebola. For example, some frontline health workers were separating children from mothers suspected of having, or confirmed to have, COVID-19 which contradicted COVID-19 guidance (although recommended for Ebola).
- Rural populations suspected that COVID-19 was an urban issue and they therefore did not follow the required prevention measures for MIYCN during the pandemic.
- Caregivers/mothers were not aware of the guidance on the continuation of breastfeeding in the context of COVID-19.
- There was limited knowledge on safe feeding for pregnant and lactating mothers, safe complementary feeding of children under five years of age, household food and drinking water safety and how to help keep family members healthy during the COVID-19 pandemic.
- Caregivers were unsure as to whether to keep taking their children for routine immunisations, regular growth monitoring and promotion sessions and what to do if/when a child fell sick.
- Pregnant and lactating mothers did not know the recommended precautions to take to avoid exposure to COVID-19 for them or their babies.

Procedure (SOP) for inpatient and outpatient management of children under five years of age with SAM. The integration of MIYCN into the SOP also aimed to protect, promote and support safe and optimal feeding practices for both breastfeeding and non-breastfeeding infants and young children in light of COVID-19.

An important focus throughout the COVID-19 nutrition response has been risk communication and community engagement (RCCE) in response to numerous communication and information challenges surrounding the pandemic.

The development of a clear RCCE strategy and plan of action was critical to ensure that people had, and continue to have, access to the right information, delivered in the right way and in a timely fashion. RCCE, in the context of COVID-19, aimed to empower people to adopt infection and prevention control (IPC) measures to protect themselves and to avoid the spread of myths and misconceptions about the disease and its effects. This article documents the RCCE activities undertaken by the Government of Rwanda, with support from UNICEF, to address issues related to maternal nutrition and IYCF in the context of COVID-19.

Implementation of a RCCE response to support MIYCN

Location of RCCE coordination

The planning, management and coordination of nutrition-related RCCE activities within the COVID-19 response was led by the MoH in collaboration with Nutrition Sector partners and UNICEF. Two sub-committees were set-up, one focusing on nutrition data management and the other, social behaviour change and communication (SBCC).

Development of RCCE strategy and planned activities

Rwanda already had a national RCCE strategy, initially developed as part of Ebola preparedness efforts that included nutrition-related activities and was further developed in light of COVID-19. Support was provided to the MoH by UNICEF's Communication, Advocacy and Partnerships (CAP) section's Communication for Development (C4D) programme to ensure that national and community-level nutrition interventions were clearly defined and in line with the East and Southern Africa Regional Office's RCCE guidance on COVID-19.

Nutrition-related RCCE needs were identified through a review of existing data from available government reports as well as mainstream media and social media reports and in consultation with Nutrition Sector partners through the sub-committees. Assessment methods included virtual meetings and/or telephone conversations with selected government representatives, rep-

resentatives from other UN agencies, the United States Agency for International Development (USAID) and non-governmental organisations (NGOs) engaged in the Nutrition Sector as well as with CHWs and frontline health workers. This review helped to identify gaps in knowledge, attitudes and perceptions in relation to nutrition and COVID-19. Findings (Box 1) generated a good understanding of the populations at risk and existing communication channels and ultimately informed the objectives of the COVID-19 nutrition-related RCCE activities. As an on-going assessment of communication needs, government supervision and CHWs' weekly and monthly reports were adapted to include gathering information on community concerns, feedback and myths and rumours relating to nutrition and COVID-19.

Based on the available evidence, nutrition-related RCCE activities were designed to support the maintenance of healthy diets for pregnant/lactating mothers and children under five years of age, encourage uptake of IPC measures in the context of IYCF, provide information on optimal nutrition including breastfeeding and complementary feeding while practising good respiratory and hand hygiene, support the continuity of growth monitoring and promote nutrition counselling, micronutrient supplementation (including vitamin A and micronutrient powder (MNP)) and SAM management activities while implementing protection precautions.

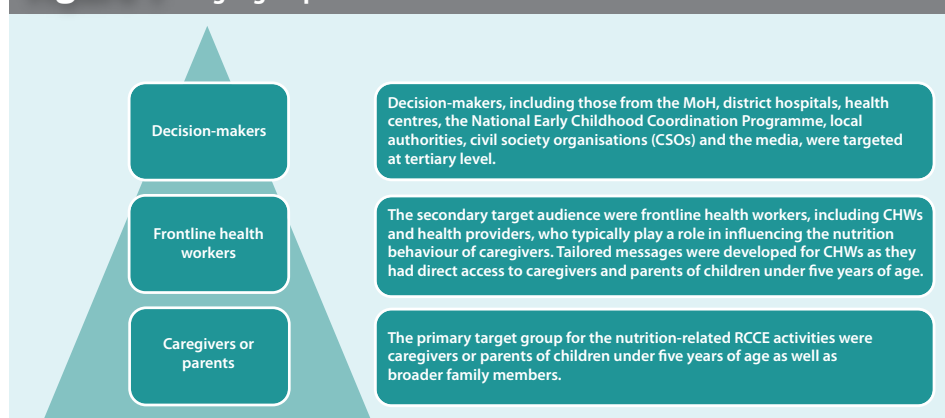
Capacity strengthening and training

Capacity strengthening and training were essential to ensure the rollout of RCCE activities. Facilitators from the MoH, supported by UNICEF, developed simplified MIYCN digital training materials that were distributed via WhatsApp and email to frontline health and nutrition workers. Remote training sessions, primarily via Zoom, were then held to discuss key learnings from the training material. Training sessions were attended by 47 participants initially and an additional 547 participants when lockdown was lifted in June 2020. Participants included directors of national hospitals, health centre staff, nutritionists working with CHWs, case management staff and IPC teams. These capacity strengthening activities played a critical role in ensuring a high-quality nutrition response during the pandemic, particularly in relation to RCCE activities.

Development of key nutrition messages

MIYCN key messages and information, education and communication (IEC) materials were developed by the SBCC sub-committee in consultation with members of both sub-committees. This process was informed by the results of the needs assessment (Box 1) and feedback on community concerns, myths and rumours around child feeding practices gathered through CHW weekly and monthly reports. Regional and global guidance was also reviewed and adapted including UNICEF and World Health Organization (WHO) MIYCN counselling cards. IEC materials were developed for health workers, essential workers

Figure 1 Target groups for RCCE activities





Box 2 Themes of the MIYCN IEC materials

- 1) The differences between COVID-19 and Ebola and the fact that mothers should continue breastfeeding even if they have suspected/confirmed COVID-19
- 2) Precautions for pregnant and lactating mothers to avoid being exposed to COVID-19
- 3) Recommended practices to feed and care for a newborn with suspected/confirmed COVID-19
- 4) Additional precautions needed during delivery and immediately after birth
- 5) Precautions to be taken during breastfeeding to keep babies safe from COVID-19
- 6) When and why a mother should express breastmilk
- 7) How to practice safe complementary feeding for children 6-24 months of age
- 8) Food safety, handwashing and sanitation during the COVID-19 pandemic
- 9) Caring and appropriate feeding for infants and young children in the context of IPC

and CHWs as well as parents/caregivers. Messages were adapted to guide caregivers and parents with intellectual disabilities. Tools were subsequently piloted and refined as needed. The main themes of the final IEC materials are outlined in Box 2.

Testimonials from mothers who had recovered from COVID-19, and who had continued breastfeeding or had given birth to healthy babies, were subsequently featured as community champions through media channels. This helped to address rumours and misinformation.¹

Channels for communication

The MoH leveraged all existing channels to disseminate key messages including print and electronic media. A total of 11,000 printed posters aimed at health workers were distributed to all 48 district hospitals and 500 health centres, including refugee camps and isolation centres, and 70,000 booklets were distributed to CHWs. Hard copies of IEC materials were distributed in conjunction with existing essential medicine and nutrition commodities. In addition, soft

copies of the posters were distributed through WhatsApp and group emails. This was followed up with virtual/ telephone briefings through an MoH WhatsApp and email group for all directors of district hospitals, health centres and nutritionists within hospitals. Telephone follow ups were also made to brief staff in the use and dissemination of the materials.

To ensure information reached those with low connectivity, the MoH also made use of the Internet of Good Things (IoGT) – a UNICEF-led initiative that hosts mobile packaged, public health content information for free even on low-end mobile devices. This was initially aimed at frontline healthcare workers but, in time, content was expanded to the general public. Virtual meetings led by MoH, on platforms such as Zoom and Skype, were also used when disseminating messages to stakeholders.

Mass media communication channels were also used. Bi-weekly nutrition messages were aired on community radio stations with a population coverage of 99%. Additionally, nutrition messages during the COVID-19 pandemic were incorporated into the renowned radio drama, 'Itetero'. Parliamentarians were used to channel information over local radio stations as is described in Box 3. Nutrition messages continue to be disseminated bi-weekly through Radio Rwanda and its five affiliated community-based radios which have a wide and broad population listenership.

Monitoring impact of the RCCE activities

Indicators from Rwanda's Health Information Management System (HMIS) were used as proxy measures for the effectiveness of the RCCE programme of activities including indicators around participation in growth monitoring, MNP distribution and admissions and treatment for SAM and moderate acute malnutrition (MAM). Social media dashboards were also periodically reviewed by UNICEF to monitor and track 'mentions', hashtags, notifications and trends to gather information and manage rumours regarding COVID-19 and nutrition. Additional monitoring was conducted through the collection

of ad hoc information, for example, monitoring the separation of mothers with COVID-19 from their infants and the cessation of breastfeeding. Supervision reports for CHWs were also collated to explore the extent to which CHWs understood the adapted recommendations. It is planned that rapid qualitative and quantitative assessments will be conducted in the coming months to collect further information on the impact of RCCE activities in relation to changes to the diets of pregnant women, mothers and children during the pandemic as well as aspects such as overall breastfeeding rates and to learn more about communities' knowledge, attitudes and perceptions regarding MIYCN in the context of COVID-19.

Results

Influence on nutrition indicators

Service uptake was monitored to indicate the influence of RCCE interventions. HMIS routine data on nutrition indicators noted that total SAM admissions increased from 9,200 admissions in April 2020 to 10,022 in February 2021. In the same timeframe, the coverage of growth monitoring services grew from 82% to 87% and the coverage of distribution of MNP to children aged 6-23 months increased from 42% to 44%. While there are many other factors at play and these figures should be read with caution given the challenges of data collection during this time, these findings point to some degree to the success of the RCCE efforts as community members clearly continued to utilise nutrition services during the pandemic.

Changes in practices

Social media and community-level monitoring revealed that mothers reported washing their hands with soap and running water more frequently than prior to the COVID-19 pandemic. A GeoPoll survey for April 2020 indicated that 98% of respondents took measures to protect themselves from exposure to COVID-19 and 37% of respondents prioritised increasing hygiene practices.²

Reach of communications targeted to and via health workers

The December 2020 report from the RBC indicated that all frontline staff, including nutritionists, received the posters with nutrition messages that were disseminated. A total of 60,000 CHWs received the booklets and qualitative feedback within the RBC report demonstrated that CHWs were using the booklets within growth monitoring sessions and during household visits. The RBC also reported that, across all 30 districts, 67% of CHWs were confident in conducting MIYCN counselling, growth monitoring sessions and home visits during the COVID-19 pandemic as a result of following social distancing protocols. It was reported that 85% of caregivers of children

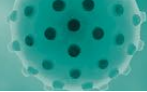
Box 3 Engaging with parliamentarians to support MIYCN messaging

At the beginning of the pandemic and in parallel to RCCE activities, UNICEF began engaging with a group of dedicated members of parliament (MPs) to expand the reach of messages on MIYCN in the context of COVID-19. MPs were used to disseminate public health messages to caregivers of children under five years of age through local radio stations. Messages focused on the importance of nutrition, specifically in relation to exclusive breastfeeding and dietary diversity for children 6-59 months of age.

The group of MPs were also able to invite representatives of relevant government institutions to speak to radio listeners on what they were doing to improve MIYCN and food security in the context of COVID-19. These talk shows enabled two-way communication whereby listeners could call in, pose questions, share comments and obtain timely feedback from the panel of government representatives. Working with parliamentarians to champion advocacy and social mobilisation to improve nutrition at all levels was critical to support RCCE initiatives. A major challenge was that parliamentarians tended not to have extensive technical knowledge of nutrition. To mitigate this, UNICEF produced a set of key MIYCN messages in light of COVID-19 for MPs and also held virtual briefings to guide related discussions.

¹ 'COVID-19: A Good Friday as New Cases in Rwanda Decline and a Baby is Born' <https://www.ktpress.rw/2020/07/covid-19-a-good-friday-as-new-cases-in-rwanda-decline-and-a-baby-is-born/>

² <https://www.geopoll.com/resources/palladium-rwanda-case-study/>



under five years of age were reached with MIYCN messages through non-digital methods. The reports also showed that the use of mobile platforms allowed CHWs, social workers and nutritionists to continue to provide dietary diversity messages and nutrition education to caregivers/parents.

In refugee camps, RCCE activities were monitored on a weekly and monthly basis through reports and participation lists provided by CHWs and partner NGOs. Those lists provided the number of refugees who had attended the RCCE sessions, participated in growth monitoring services and received MNP and children who received treatment for wasting. Reports showed that, by the end of 2020, approximately 8,300 caregivers had received nutrition services including messages on MIYCN best practices in the context of COVID-19. Feedback collection, rumour tracking and complaints were compiled through weekly and monthly reports which would also feed into the abovementioned processes.

Reach of mass media communication

By the end of May 2020, the COVID-19 MIYCN and IPC messages were estimated to have reached over three million people through the medium of radio. Community feedback suggested that most caregivers appreciated the radio talk shows and counselling by CHWs regarding how best to feed infants and young children in the context of COVID-19. It was noted that they understood that poor diets have the potential to exacerbate pre-existing conditions, putting mothers and children at elevated risk of contracting COVID-19. One community member shared,

"You know before, we feared that Corona [virus] was like Ebola, but I learnt [through the radio show] that it's different, we now know how to protect ourselves and the children. The radio programmes are helping us to protect our families, and that makes me feel safe. I learnt that my family, especially young children, need to eat nutritious food every day to provide energy and nutrition to keep them strong".

Use of Twitter, Facebook and other social media platforms offered numerous opportunities to deliver MIYCN messages to reach target audiences with key information and elicit engagement that related to changes in behaviour. In addition, UNICEF developed a video called 'You can trust these tips from a UNICEF Nutrition Expert' which aimed to raise awareness of the importance and benefits of breastfeeding and optimal complementary feeding. The video generated 69.7k views, 70 shares and 2.2k likes on Facebook. Social media, however, also enabled the continued circulation of myths and misconceptions (as discussed below).

Challenges

In spite of strong MIYCN messaging to the contrary, myths and misconceptions around the breastfeeding of infants when a mother was a suspected or confirmed COVID-19 patient re-

sulted in some mothers being separated from their infants for the two-week isolation period. Although no quantitative data was available to understand the degree to which this was happening and the subsequent impact on breastfeeding rates, supervision reports indicated that this was a significant issue which resulted in some mothers being unable to relactate when united with their infants. To mitigate these challenges, sensitisation of frontline health workers was conducted through face-to-face and virtual meetings and printed materials with clear messages were disseminated.

Considerable delays (up to a month) were experienced in approving messages and communication materials for dissemination in both print and digital form. Consistent engagement with stakeholders enabled their eventual approval and dissemination. Additional human resource capacities were posted to MoH, with UNICEF support, and contributed to addressing some of the challenges. Two staff members from UNICEF's CAP section and one staff member from the Nutrition Section were recruited to support additional needs and challenges.

Despite correct messages having been disseminated widely, limited access to resources, such as face masks, other personal protective equipment (PPE), clean running water, soap and alcohol rub, hindered CHWs from providing timely nutrition counselling services which threatened the adoption of the recommended MIYCN practices.

Some radio talk show discussions and social media communications demonstrated that myths and misconceptions around IYCF and COVID-19 continued and spread throughout the pandemic. To address this issue, UNICEF has started supporting the Government to partner with agencies such as the Rwanda Red Cross to analyse feedback through existing complaints mechanisms, track rumours and misconceptions and monitor the reach of RCCE activities. Within the partnership with Rwanda Red Cross, for example, data in relation to handwashing practices, the use of masks and broader social distancing and prevailing rumours and myths is collected. This data is used to inform the government response.

Lessons learnt

Establishing a coordination structure through the development of sub-committees, where roles and responsibilities were clearly defined, was an effective way to harmonise nutrition RCCE and ensure the efficient use of resources in the context of COVID-19. The creation of the sub-committees was noted to be effective in bringing together and coordinating a wide range of stakeholders in relation to nutrition RCCE messaging. It further helped to identify potential gaps in the RCCE response, facilitated the sharing of information to enable the development of key messages and appropriate IEC materials and helped to avoid duplication.

Identifying supporters/collaborators for RCCE activities on nutrition early on in the response, including other ministries, public institutions and civil society organisations (CSOs), was noted to be a critical element for developing and disseminating harmonised nutrition messages.

Wide dissemination of appropriate evidence-based RCCE nutrition messaging through multiple channels helped to build the capacity of caregivers/parents to protect themselves and their children in light of COVID-19. Adaptation of available regional and global guidance to support message development on nutrition in the context of COVID-19 was seen to be an effective starting point for developing contextualised key nutrition-related RCCE activities.

Due to the country's total lockdown, strengthening the capacity of frontline health workers to improve child nutrition in the country's hardest-to-reach areas and to promote and support appropriate MIYCN in the context of the pandemic was a challenge. This was overcome during the facilitation of remote online training and follow-up.

Given movement restrictions and social distancing requirements, conducting rapid assessments to understand communities' knowledge, attitudes and perceptions in relation to MIYCN in the context of COVID-19 was not possible. As a result, developing appropriate RCCE content was challenging. The RCCE nutrition needs assessment exercise helped to overcome this gap and enabled the rapid identification of gaps in knowledge, attitudes and perceptions around nutrition. Similar exercises focusing on key areas such as breastfeeding practices could be used to further guide messaging.

Conclusion

As COVID-19 continues to impact the lives of many, adapting appropriate RCCE messages and exploring alternative communication channels is vital to ensure it has an impact on targeted behaviours. More research is needed to explore the critical context-specific factors responsible for improving the diets of women and children and those that may act as barriers for the uptake of nutrition services. As a next step, the Government of Rwanda intends to conduct a rapid qualitative and quantitative assessment to learn more about the communities' knowledge, attitudes and perceptions regarding MIYCN for children under five years of age in light of COVID-19, how COVID-19 has affected children's nutrition, communication patterns and channels as well as the impact of the pandemic on nutrition services. Such assessments will help the government to understand the extent to which RCCE messages have impacted on behaviour and to further develop optimal RCCE interventions for nutrition, forming part of the country's comprehensive COVID-19 response strategy.

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Growkits distribution to urban farmers

Localising food supply chains during the COVID-19 pandemic: An example from the Philippines, Move Food Initiative

By Natalie Sessions and Christine Jodloman



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This article is based on a series of interviews conducted with the AGREA team as part of the development of a SUN Movement 'Solutions Brief'. Interviews were conducted with Cherrie Atiliano; CEO, AGREA; Sef Carandang; Move Food Initiative Volunteer/ Gender Specialist, United Nations; Sonia Gonzales, Business Operations Manager, AGREA; Benjamin Jorge Cadag, Agribusiness Manager, AGREA; Caroline de Leon, Mindanao Logistics Officer, AGREA; Mary Ann Reyes, Administration and Finance Manager, AGREA and William Dar, Secretary of the Department of Agriculture, Philippines. The authors are grateful for the support of the SUN Movement Secretariat for identifying this story and for the support in developing and disseminating the broader 'Solutions Brief'.

PHILIPPINES

What we know: The COVID-19 pandemic and the subsequent country lockdowns have had a large impact on food systems, particularly in relation to supply chains. This has necessitated the strengthening of local supply chains.

What this article adds: In the Philippines, a local non-governmental organisation, AGREA, developed the Move Food Initiative which aimed to move food from farms to consumers and to reduce food waste during the pandemic by using an online fresh food ordering platform and developing 'rescue kitchens' which repurposed fresh produce that would otherwise go to waste. While working closely with farmers, AGREA was able to see first-hand some of the problems farmers faced, particularly in the area of post-harvest losses, and have now begun empowering farmers to diversify crops and implement additional measures to reduce post-harvest losses. AGREA has also helped to foster a greater understanding for consumers of where their food comes from.

Background

As a measure to limit the spread of COVID-19 in the Philippines, strict lockdowns, known as community quarantines were imposed in many parts of the country. The strictest of these began on the 16th March 2020 when an enhanced community quarantine (ECQ) effectively shut down most parts of the country, restricting movement except for when essential. In Metropolitan Manila, the quarantine led to challenges in obtaining fresh produce with supermarkets and wet market stalls¹ struggling to meet demand. In other parts of the country, farmers faced challenges in selling their produce, there were logistical problems in transporting produce from farms to cities and, with restaurants closed, Filipino farmers were left with few people to sell their harvest to, leaving fresh produce going to waste.

The Department of Agriculture (DA) mobilised to try to mitigate the effects of the ECQ on agricultural activities including developing a food resilience protocol. A number of mitigation measures were put in place such as developing food passes that enabled trucks carrying food and agricultural products to pass through quarantine checkpoints, increasing efforts to promote urban agriculture through the distribution of seeds and planting materials and developing 'price freeze' policies to manage unreasonable and excessive price increases of basic necessities during the ECQ. However, recognising that the DA was not able to act as quickly as it would have liked given the necessary bureaucratic processes within the government, the

¹ A wet market is a marketplace selling fresh meat, fish, produce and other perishable goods as distinguished from dry markets that sell durable goods such as fabric and electronics.

DA welcomed public-private partnerships to support agriculture activities during this time.

AGREA was one such partner, led by its CEO, Cherrie Atilano. AGREA aims to support the empowerment of local farmers by implementing sustainable agricultural practices and creating inclusive agribusiness livelihood programmes. This article explores how AGREA reacted to the challenges brought about by the ECQ and tells the story of AGREA's Move Food Initiative, an initiative to move food from farms to consumers and to reduce food waste during the pandemic. This article is based on interviews held with the AGREA team in the development of a [Solutions Brief](#) which was published jointly by Emergency Nutrition Network (ENN) and the Scaling Up Nutrition (SUN) Movement.

Moving food from farms to the city

Three days after the ECQ was imposed, Atilano received a call from one of the farmers who AGREA works with who had 15,000 pineapples he had just harvested about 60 kilometres from the capital city. He was unable to transport the fruit to markets given the imposed quarantine. Through its wide network and support system, AGREA was able to source a truck owned by the local municipal government that was able to pass through the stringent checkpoints and transport the pineapples to Metropolitan Manila. By posting on Facebook and again using the networks that AGREA already had, they were able to sell 3,500 pineapples in just three days.

Seeing the success of this initial opportunity, AGREA began receiving more calls from farmers asking for help to move their produce so decided to launch the Move Food Initiative to support this effort.

As with the first call, AGREA relied on Facebook to communicate information about the initiative as this is a social media platform that is widely used in the Philippines. From the very beginning, word spread quickly through the social media platform and people started to respond with offers of help. AGREA's Facebook page already had a dedicated audience of farmers with whom they had worked for the last five years who were made aware of the initiative and who reached out when they had harvested their produce. This network also included those who were interested in supporting the agricultural sector and who were willing to volunteer when needed. For example, when a call was posted relating to the need for trucks to transport food, one furniture company offered the use of a delivery truck. This was repurposed for the pick-up and delivery of agricultural produce. Private trucks and cars were offered by friends and acquaintances across farming regions and restaurants that had temporarily closed due to the quarantine were made available to be used as storage depots.

An online fresh food ordering platform, using a simple Google form, was set up to distribute



Supporting women farmers

the produce when it arrived in Metropolitan Manila. This included a list of the available fresh produce as well as the amount available and the price. To determine the price, AGREA used the price freezing standards set by the DA to ensure that farmers and consumers were not taken advantage of. Customers were requested to indicate on the form what they would like to purchase and to share the details of where the food would be delivered to. Given the logistics of delivering to individual consumers, AGREA instead targeted the building of communes, homeowners associations and businesses where food would be delivered to a central point and one volunteer would be responsible for moving food to individual consumers and households. These volunteers, known as 'movers', would subsequently set up stalls or mini-markets in building communes (observing strict social distancing measures) to pass produce on to those who had ordered it. Movers were generally well known in their communities and by consumers and hence already had a level of trust for those buying the produce.

Emerging issues

As the initiative progressed, a number of emerging issues were noted that required creative solutions from AGREA.

ECQ restrictions and harvesting challenges

In some areas, only two to three people were allowed to harvest produce at a time as a result of the ECQ. Although no quantitative data was collected, this reportedly led to huge delays in harvesting and subsequent post-harvest losses. To solve this, AGREA spent time advocating with mayors to enable more people to support the harvesting while still adhering to social dis-

tancing guidelines. In some areas, as a result of advocacy by AGREA and the DA, these restrictions reportedly reduced and more people were allowed to support in the harvesting of crops.

Financial payments

Paying farmers was another emerging challenge and required flexibility. Typically, AGREA paid farmers in person with cash but the limitations of the ECQ meant that AGREA had to shift from cash payments to bank transfers. Many farmers did not have access to bank accounts and were not able to open one due to not having an Identity Document (ID) so therefore creative ways of sending money had to be found. In some instances, rural banks or the bank accounts of relatives or friends were used or, in areas where there were no ATMs, at times AGREA paid local government officials in central locations and the officials would then distribute the money directly to the farmers. AGREA would subsequently follow up with the farmers to check that they had received the money and if they had distributed it amongst the farming cooperatives as per the agreements.

Working with different communities

As AGREA worked with ever-increasing numbers of farming communities across the country, they realised that ways of working were different in each community. The team had to contextualise the approach based on the farming community involved. For example, an indigenous farming community was identified as needing support to sell raw honey produced on ancestral land. Working with this community required a different way of working to build trust and to ensure that traditional practices were protected. AGREA relied on a volunteer who had an in-depth



Watermelon delivery

knowledge of this community and was able to facilitate AGREA offering support.

Transportation of food

One challenge of transporting the food using vehicles that were not municipal government vehicles was the negotiation required at quarantine checkpoints. The team had to secure food passes from an Inter-Agency Task Force (a special inter-government taskforce set up in light of COVID-19) which verified that their vehicles were carrying essential food commodities. These passes were often challenging to obtain and required support from local DA officials and government actors who were able to push the processes forward. AGREA had to spend a lot of time utilising local contacts and leveraging strong working relationships built prior to the pandemic to gain the support of government actors to secure the food passes. The DA was instrumental in supporting AGREA in this regard.

As the initiative grew, AGREA began receiving calls from farmers further afield who also needed to move their food. Considering that the Philippines is an archipelago of 7,107 islands, both sea and air transportation were needed along with land transportation. During the ECQ, such transportation also required special permission and came with its own challenges which is why the bulk of transportation was undertaken via land transportation. Sea transportation took time (up to five days) and was subject to weather challenges. Estimating the time that sea transportation would arrive in port was also difficult and meant that members of the AGREA team had to wait at the port for many hours. Air transportation was much quicker (typically only one to two hours). However, the new restrictions within airports meant that once a plane had landed, it took many hours to complete the paperwork and secure the food. These delays were

challenging given the need to move fresh produce as quickly as possible to prevent it spoiling. This challenge was also very noticeable when using land transportation as the trucks being used were not made for fresh food conveyance. They were poorly ventilated and lacked proper air conditioning. As such, food orders were prone to spoiling during the journey. Since there was not much that the AGREA team could do to address the challenges in transportation, it became vital that open communication was maintained with consumers so that they too understood the realities and challenges of transportation and were prepared for delays or for when stock was not of a high quality. This helped garner a sense of trust with consumers as they felt that nothing was being hidden from them in the process. Furthermore, when journeys were very long, the DA supported and provided cold storage to keep the food fresh while awaiting delivery in Metropolitan Manila.

Tackling food waste

The biggest emerging issue was that of food spoilage and food waste. In April, it became apparent that a surplus of tomatoes would go to waste if not used. There was also a growing supply of so-called 'ugly' foods which consumers were more reluctant to consume as well as a recognition that AGREA was having to throw away food that arrived in Metropolitan Manila already spoilt.

On the other hand, there was the challenge of restaurants being shut and chefs and restaurant workers being out of work. As a result, the Move Food Initiative decided to partner with chefs to develop products made from these oversupplied and misfit foods, naming the initiative the AGREA Rescue Kitchen (ARK). Initially, Pomodoro sauces and tomato jams were developed and this expanded to a broad range of produce including other types of jams, smooth-

ies, soups, salad dressings and many other products depending on what surplus was available. Products were designed to be seasonal (based on what was grown at the time), artisanal (hand-made), intentional (designed out of foods that would otherwise be going to waste) and limited (in supply).

Like many countries, food loss is a major issue in the Philippines. Before the pandemic it was estimated that 30% of produce was lost post-harvest and during the pandemic this rose to almost 60%. This challenge became a priority for the Move Food Initiative. The products produced by the ARK were well received and demand has grown over time. The ARK also donated fresh produce and seasonal products to frontline and other essential workers.

Additional campaigns were developed to limit food going to waste. These included 'Hero Drives' where consumers were encouraged to buy fresh produce in bulk for a discount and the 'Being Crate-ful' Drive where crates filled with assorted available vegetables were sold to consumers. The 'Crate-ful' Drive, launched in August 2020, was the Move Food Initiative's way of extending gratitude to key workers. Consumers were told that for every crate of fresh and healthy fruit and vegetables purchased, AGREA would set aside a food parcel for selected beneficiaries, particularly jeepney (local bus) drivers and garbage collectors. In just five days, all the fruit crates had sold out, making it possible to deliver food parcels to 84 jeepney drivers and 12 garbage collectors. 'Donate a vegetable' campaigns were also developed in which AGREA promised that, for every 300 kg of produce ordered, 15 kg would be donated to kitchens that supplied frontline workers.

Supporting farmers in the 'new normal'

While working closely with farmers, AGREA was able to see first-hand some of the problems farmers faced particularly in the area of post-harvest losses. Farmers appeared to lack the skills and know-how to reduce these. AGREA built such factors into a brief capacity-building training that was conducted over the telephone and has worked hard to help farmers to better plan their harvests to avoid losses. Creative ideas and practices to prolong the life of food from farmers themselves were also tapped into and shared among other farming communities. One reason for post-harvest losses was the lack of diversity in crop planting – communities tended to produce the same crops that were harvested at the same time leading to a produce surplus. In light of this, AGREA and the DA have started working with farming communities to diversify the produce grown in provinces.

A further realisation that AGREA had was the fact that farmers lacked the skills for and understanding of effective pricing models for their produce. Instead, in the past they have tended to rely on middlemen who take a cut of



their profits. AGREA has slowly started working with farmers to help them to understand how to cost their produce and how to budget their income so that they are less reliant on taking out loans and working with middlemen in order to keep their farms operational.

Supporting consumers in the 'new normal'

The biggest impact of the quarantine was the realisation by the public of the need to think about how they obtain their food. In an increasingly industrialised world, people have largely lost the connection to people growing their food and the pandemic has offered the opportunity for consumers to engage in a new way going forward. As a result, AGREA has also been promoting 'grow kits', urban gardening kits that include seedlings, potting mixes, seedling trays and a grow manual to encourage people to grow things at home, no matter how limited their space is. This is in line with the DA's 'Plant, Plant, Plant' programme that includes the distribution of seeds and planting materials as well as the establishment of community gardens. Home gardening was also promoted during the pandemic as a productive family activity that could be done during the ECQ.

Another lesson from the Move Food Initiative was the need to connect consumers to farmers. During the pandemic, there was a renewed focus on where food was coming from and AGREA was able to educate consumers on the process involved in getting food from farms to their homes. The Move Food Initiative Facebook page facilitated engagement with the wider consumer community and helped to connect farmers and consumers. By sharing farmers' stories on the platform, consumers were able to get a sense of where their food was coming from, which

farmer had produced the fruit and vegetables and what it took to bring produce to the market.

Building off the successes of the initiative

The Move Food Initiative was subsequently adapted in light of a series of typhoons that affected the country in October 2020 (Typhoons Quinta, Rolly and Ulysses) to support farmers in the affected communities through a 'Rise Up and Recover' drive to support their recovery. One aspect of the drive was the 'Buto ng Pag-asa' or Seeds of Hope Initiative, where customers could sponsor a set of seeds that would cover 1,000 square metres of land.

The Move Food Initiative and the broader efforts by the DA have led to greater investments in agriculture by the Government of the Philippines. Amid the pandemic, efforts by the government and partner organisations have focused on localising food supply chains to prevent food waste and also to feed families.

The Move Food Initiative has also been shared widely as a success story in the midst of the pandemic, including through the SUN Movement, to promote the generation of ideas in other countries that are dealing with food waste and struggling to move food during lockdowns.

Results

By 1 June 2020, the day the Philippines began lifting quarantine measures, the Move Food Initiative had shipped over 160,000 kg of fruit and vegetables from more than 7,400 farmers to nearly 52,000 families. By the end of November 2020, 191,447 kg of fruit and vegetables had been delivered, 28,122 farmers had been partnered with and fruit and vegetables had been served to 78,177 families and 4,690 frontline workers. Farmers reported stories of how the

initiative had impacted their lives such as the very first pineapple farmer who was able to pay back his loans and pay for his child's school fees. The initiative has been recognised within the DA and further afield with Atilano and AGREA winning numerous international and national awards.

Lessons Learnt

Several lessons were learnt during the process of rolling out the Move Food Initiative and were, in part, key to its success. These included:

- 1. The need to be creative and agile:** The process of moving food around the country was entirely new to AGREA and the team had to learn as they went along, adapting and adjusting based on the emerging needs. Agility was needed to work differently with different farming communities and creativity was needed in order to overcome some of the challenges.
- 2. The importance of leveraging one's network:** From the beginning, the Move Food Initiative relied on AGREA's wide network of allies. Across Atilano's and AGREA's network, volunteers were engaged at both ends of the spectrum. Volunteers dedicated large amounts of personal time to support the initiative and helped to ensure food moved from farm to consumer. Facebook has played a critical role in this mobilisation. From the very beginning, word spread quickly through the social media platform and people started to respond with offers of help.
- 3. The need to complement government efforts:** AGREA has always aligned to government goals and objectives and maintains strong communication links with the DA who it kept continuously informed of its plans during the pandemic.
- 4. Contextualising the approach:** The Move Food Initiative looked different in each farming community and each consumer community. As such, there was not a logistical blueprint but instead the model was adapted as needed. The ways of working with farmers, the ways of transporting goods and the ways of paying farmers were all adapted based on the unique needs of each farming community. A similar process of contextualising approaches was also noted at the consumer end.

Conclusion

While the pandemic has brought unprecedented suffering and challenges across the globe, it has also offered an opportunity to rethink practices and food consumption patterns. The Move Food Initiative is a small-scale example of a response to some of these large challenges. It is farmer-focused, community-based and sustainable. In addition, it provides a model that other countries can adopt, on a bigger scale, for a more sustainable future food system.

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A turmeric farm

Adapting infant and young child feeding interventions in the context of COVID-19 in Somalia

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IYCF counsellor conducting a home visit

SOMALIA

What we know: The COVID-19 pandemic and resulting infection prevention control (IPC) measures have required nutrition programmes to adapt to ensure that services can continue.

What this article adds: Adaptations were required to the Concern-supported infant and young child feeding (IYCF) programme in Somalia to ensure that caregivers of infants under two years of age continued to access vital IYCF individual and group counselling services, tailored to the COVID-19 context, in a way that minimised the risk of transmission of the virus. Adaptations included the translation and dissemination of key IYCF COVID-19 messages, the training of health workers on IYCF in the COVID-19 context, IPC measures implemented in individual and group counselling sessions, a reduced number of participants at group counselling sessions (and an increase in the number of sessions held and IYCF counsellors per health facility to support this), an increased number of handwashing stations at health facilities and the inclusion of people recovered from COVID-19 into counselling sessions to help to address the stigma and rumours associated with the virus in the community. Programme data shows that the number of beneficiaries reached during 2020 increased compared to 2019 as a result of the adaptations made. A key challenge was the huge effort required to promote and support many behaviour changes in a short space of time among health staff and beneficiaries and the need for additional funds, made possible by the realignment of budgets and flexible donor funding arrangements.

Background

Somalia is the second most fragile country in the world, with around 69% of the population living below the poverty line. Somalia's humanitarian situation has worsened in recent years due to the devastating combination of conflict and increasingly erratic weather and climate shocks including drought. Three additional shocks – a desert locust upsurge, extensive flooding and the COVID-19 pandemic – deepened the scale and scope of the humanitarian crisis in 2020, the consequences of which will exacerbate humanitarian needs in 2021. In March 2020, the COVID-19 caseload surged to 7,518 confirmed cases and, by March 2021, stood at 3,284 active cases with 249 confirmed deaths. According to a World Health Organization (WHO) global estimate, 20% of Somalis

will suffer from the pandemic's direct and indirect impacts in 2021. Access to healthcare remains very limited in Somalia due to the scarce availability of skilled health professionals and a dilapidated public health infrastructure, particularly in rural areas, resulting in some of the world's worst health outcomes.

Child malnutrition remains one of Somalia's major issues and, in most cases, internally displaced persons (IDPs) are the worst affected. Somalia's Food Security and Nutrition Analysis Unit (FSNAU) has estimated that approximately 840,000 children under the age of five will be wasted in Somalia in 2021, including 143,000 who will likely be severely wasted (FSNAU, 2021). Concern Worldwide Somalia admissions data reveals a stark increase in admissions of

wasted children from January to December 2019 compared to 2020 (16,140 versus 33,807) which demonstrates a worsening nutrition situation.

Protecting and promoting safe and appropriate infant and young child feeding (IYCF) practices is essential for preventing and treating malnutrition. The Somalia Micronutrient Survey 2019 by the Federal Ministry of Health (FMOH) and UNICEF Somalia revealed very poor IYCF practices in Somalia with only 5.3% of children less than six months of age exclusively breastfed and only one-quarter of newborns experiencing early initiation of breastfeeding. Inadequate knowledge and attitudes in the community around exclusive breastfeeding and the introduction of pre-lacteal feeds remains a major challenge in achieving optimal IYCF practices in IDP camps in the country (SAF-UK International, 2016). Complementary feeding practices are also often sub-optimal with children introduced to semi-solids, solids and animal milk either too early or too late. Mothers in Somalia also have limited access to information and health facilities are often the only place to access support for optimal IYCF practices (SAF-UK International, 2016).

Concern Somalia IYCF programming

The health and nutrition component of the Concern Somalia programme encompasses health and nutrition service delivery through fixed and mobile services as well as demand creation through community mobilisation and the promotion of positive behaviour changes in health, nutrition and hygiene practices. Currently, Concern supports 20 health and nutrition facilities including one national referral stabilisation centre (14 fixed and six mobile facilities) where IYCF counselling is integrated within the health and nutrition component. Five of these facilities are directly implemented by Concern Worldwide, five through the government health system with strengthening support provided and 10 facilities are implemented by Concern Worldwide partners.

The primary objective of the IYCF activities is to improve the knowledge and skills of health

service providers and community health workers (CHWs) so that they will, in turn, be able to provide timely, relevant and quality IYCF counselling support to mothers, caregivers and other key community influencers. The target group for the counselling sessions are mothers/caregivers of children 6-24 months of age and pregnant and lactating women who attend the health facility for community-based management of acute malnutrition services, vaccination, antenatal care, postnatal care or any other health services. The counselling sessions are conducted by a trained CHW who administers a general screening question to identify issues/challenges related to appropriate infant feeding practices to help to focus counselling on the topic/s presenting a challenge. Subsequent sessions mainly follow up on the advice given to support the resolution of the problem after which the CHW moves on to any other challenges that present. Group counselling sessions are also organised at facility-level on every morning of the outpatient therapeutic programme day. Prior to the COVID-19 pandemic, group counselling involved two female community workers to facilitate a group session with five to 20 caregivers. Female facilitators are used based on the findings of a previous assessment that found that pregnant and lactating women and caregivers were more likely to build a positive and responsive relationship with the facilitator and feel more comfortable discussing their issues (including barriers) with other women (FSNAU, 2016).

Programmatic adaptations in the context of COVID-19

The Concern team faced several challenges at the onset of the COVID-19 crisis to enable these essential IYCF counselling activities to continue. Initially, caregivers did not visit the health facilities as frequently as normal due to the fear of COVID-19 infection and were not comfortable attending the counselling sessions when they did visit. There were also widespread rumours related to breastfeeding and COVID-19 risk that needed to be addressed urgently. Therefore, following the guidance from FMOH and the Somalia Nutrition Cluster, Concern made the following adaptations to the service

delivery modality to ensure the continuity and provision of quality IYCF (E) interventions in this new context. The adjustments aimed to allow the counsellors to provide IYCF counselling sessions to targeted beneficiaries to address routine challenges, as well as those that presented as a result of the pandemic, in a way that posed the minimum risk of virus transmission.

Translation and dissemination of WHO/UNICEF key IYCF COVID-19 messages

All the key IYCF messages/recommendations in the context of COVID-19 were translated into the local language and widely disseminated and shared with the health facilities supported by Concern and its partner organisations.¹

Training of health workers on IYCF in the COVID-19 context

At the initial outbreak of the COVID-19 pandemic March 2020, routine interaction with programme staff and beneficiaries revealed a lot of misconceptions, fear and stigma associated with the disease and its mode of transmission. In order to address these uncertainties and misinformation, a series of trainings were provided to all health facility staff and CHWs on the introduction of COVID-19, infection prevention control (IPC) measures and risk communication and community engagement messages around COVID-19, specifically COVID-19 and IYCF practices. The aim of the training was to ensure that all staff and CHWs were equipped with the appropriate knowledge and skills to reduce the risk of transmission within health facilities, deal with the fear and social stigma prevalent in the community and support optimal IYCF practices in this new context. In total, 181 health staff and CHWs received training across different programme locations. Job aids were also provided to each health facility (such as laminated information, education and communication materials for use during counselling) and additional on-the-job mentoring and support was provided.

Infection prevention control measures implemented during individual counselling

Protocols were put in place to ensure that the IYCF counsellor and caregiver maintained a minimum distance of one metre between them at all times. Counselling took place within a well ventilated room, caregivers and counsellors washed their hands before entering counselling rooms, counsellors and beneficiaries wore face masks throughout counselling and greetings involving physical contact were avoided. These protocols were made clear to all caregivers on arrival.

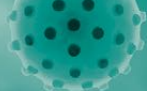
Reduced number of participants at group counselling sessions

Protocols were also put in place to reduce the number of participants attending support group meetings and group promotion sessions to three

Figure 1 Number of participants reached with counselling sessions per month January 2019 to February 2021



¹ <https://www.humanitarianresponse.info/en/operations/somalia/document/covid-19-iycf>



to five per session (compared to the up to 20 participants per session pre-COVID-19). Numbers were determined based on the availability of space at each facility to ensure that all beneficiaries were able to maintain a one metre distance from each other. In order to ensure that, at a minimum, the same number of beneficiaries could be reached, the number of group counselling sessions was increased from approximately 100 sessions/month/facility pre-COVID-19 (four sessions per day) to 180/per month/facility (around seven sessions per day). Health facility records show that pre-COVID-19 (2019) the total number of sessions held was 6,436 while 15,642 sessions were held post COVID-19 (2020). Figure 1 shows the number of participants attending group counselling sessions per month during 2019 and 2020. The figures show an initial drop in participants after the pandemic hit around April 2020, as caregivers lost confidence in attending the health facilities but an overall increase in attendance across the year with some variation by month initially as training and infrastructural changes were carried out in each facility. Overall, the number of participants at group sessions increased from 31,752 in 2019 to 41,245 in 2020. To support the increased number of counselling sessions held, new counselling staff were recruited so that each facility had three trained IYCF counsellors compared to two pre-COVID-19.

Increased number of handwashing stations at health facilities

Pre-COVID-19, Concern-supported facilities only had one hand washing station. To facilitate increased hand washing, infrastructural support was provided to all facilities to increase the number of hand washing stations to three. This served to reduce overcrowding around hand washing points and ensure that hygiene protocols could be followed. Caregivers themselves played an important role in many health facilities in ensuring that other caregivers made use of the hand washing points on entry to the facilities.

Addressing the stigma and rumours associated with COVID-19

Community feedback at the onset of the pandemic indicated that many people did not believe that COVID-19 was real as they did not know anyone who had had the virus or did not see stories in the media about people who had been affected. Stories that did appear in the media tended to feature politicians or famous people who had caught the virus, adding to the belief that only rich, influential people who travel were affected by the disease. This misconception directly impacted beneficiaries' willingness to comply with COVID-19 specific IPC measures and IYCF guidance recommendations, such as wearing face masks while breastfeeding. To combat this, training and support was given to IYCF counsellors to include the sharing of stories of local people who had recovered from COVID-19 in group counselling sessions to show that the disease was real and could affect anyone.

Discussion

The quick adaptation of the IYCF programme in Somalia enabled the continuation of essential services in the COVID-19 context and enabled support for caregivers to mitigate the potential negative effects of COVID-19 myths and misconceptions around infant feeding practices. Data shows that, as a result of the adaptations made, particularly the addition of extra staff capacity and the increased frequency of group sessions, more caregivers were reached with IYCF messaging than in the previous pre-COVID-19 year. This has been a positive outcome of the adaptations made. As adaptations were put in place and after initial variations due to infrastructural changes and training, the number of participants at group sessions increased showing that the adaptations were successful which allowed the programme to reach a high number of caregivers. It is too early at this stage to measure the impact of the programme on IYCF practices in the community. However, data shows that cases of acute watery diarrhoea dropped in 2020 compared to 2019 (622 cases recorded April to June 2019 compared to 436 cases April to June 2020) which is likely associated with the adoption of IPC measures in the community and at health facilities.

The adaptations made to the Concern-supported IYCF programme in Somalia were an immense challenge for programme management and staff. Much advocacy was required to bring all staff on board right down to facility-level and to provide the support needed to ensure that necessary adaptations were made and remained in place, even up until now. The necessary changes were not accepted instantly by staff and beneficiaries who were, for example, hesitant as to the need for reduced numbers of participants at the sessions, the increased numbers of sessions and the use of IPC measures. It has taken much effort to continually engage staff and beneficiaries to ensure that the need for these changes is understood and that health staff are equipped with the knowledge and skills needed to implement them. A key lesson learnt, therefore, is that even in the COVID-19 context, behaviour change takes time and requires much effort and constant engagement to be successful.

There were many additional costs associated with the programme adaptations made, for example for the procurement of personal protective equipment, the recruitment of and payment for extra staff members, extra training and mentoring of health staff, translation and printing costs of the adapted IYCF materials and the infrastructural costs associated with providing additional handwashing facilities and triage and counselling spaces. In order to support the extra costs, budgets were realigned, a key enabling factor that was only possible thanks to the flexibility of Concern's donors.

Support from the government was also an important enabling factor. At national-level, the Somalia FMOH has played a leading role in the

coordination of national-level Nutrition Cluster communications and engagement with other key government players. In addition, the FMOH has revitalised the national IYCF technical working group, of which Concern Somalia is a key member, to enable communication, alignment with national and global level recommendations and the sharing of programme adaptations and experiences in the COVID-19 context. This has been an important vehicle for the learnings from the experiences described in this article to be shared with other partners engaged in IYCF programming in Somalia and to support similar programme adaptations across the country. Efforts have also been made to align and coordinate COVID-19 mitigation measures across the different sectors, via the nutrition, health, food security, Water, sanitation and hygiene and protection clusters, to enable a harmonised response. This level of coordination has enabled the sharing of IYCF messages in the COVID-19 context to all beneficiaries for greater impact. The Government of Somalia must continue to support these efforts to enable optimal IYCF programming across all sectors moving forward.

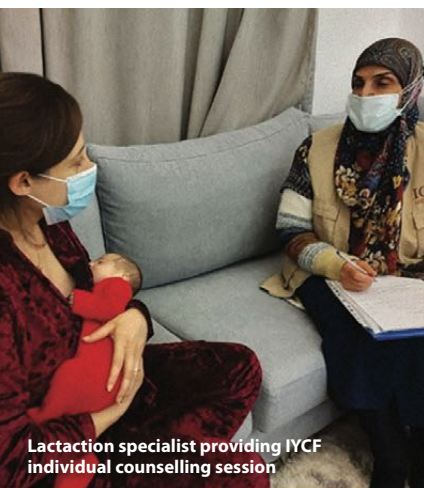
Conclusion

Individual and community-level IYCF counselling is critical to support optimal IYCF practices, including the provision of timely support to the carers of newborns to facilitate the early initiation of breastfeeding and exclusive breastfeeding and support to improve the dietary diversity and ongoing breastfeeding of infants aged 6-23 months. The COVID-19 pandemic has uniquely challenged the ability of IYCF counsellors to reach the intended beneficiaries at a time when optimal IYCF practices are challenged by myths and misconceptions around the disease. To address this, rapid adaptations were required to the Concern-supported IYCF programme in Somalia to ensure that caregivers could still be reached with adapted, targeted IYCF-related messages and tailored support in a way that ensured the minimum risk of transmission of the virus. This required additional funds, made possible through the flexibility of donors, to support an unprecedented effort to train and recruit additional staff, make infrastructural changes at health facilities and provide the support needed to beneficiaries. While not without challenges, the increased number of beneficiaries reached during 2020 compared to the previous year is an early indicator of the positive impact of the adaptations made. Learning is still taking place and ongoing efforts to capture the impact of the programme on IYCF practices in the COVID-19 context will provide important lessons in the future.

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Lactation specialist providing IYCF individual counselling session

Infant and young child feeding in emergencies: Programming adaptation in the context of COVID-19 in Lebanon

By Bayan Ahmad



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LEBANON

What we know: During emergencies, promoting adequate infant and young child feeding (IYCF) practices saves lives.

What this article adds: International Orthodox Christian Charities (IOCC) IYCF activities that already targeted both refugees fleeing conflict in Syria and vulnerable Lebanese families were adapted in response to the COVID-19 context. Volunteer educators and lactation specialists were mobilised to scale up awareness raising and one-to-one and group counselling, both remotely and in person with infection prevention control measures in place, and a national hotline was established. IOCC lactation specialists reached more than 11,000 pregnant and lactating women in 2020 with IYCF counselling (versus 3,000 in 2019) and IOCC educators and volunteers reached more than 24,000 caregivers with IYCF education (compared to 1,500 in 2019). IOCC supported the Lebanese government to ensure breastmilk substitutes were only provided according to the national legal framework. Challenges included the lack of internet access for some women, an increase in workload and the need for additional resources. Lessons learned include the need for preparedness plans pre-emergency, the need for sustained support for IYCF programming in Lebanon including investment in community volunteers, lactation specialists and training for health workers, the need to adapt IYCF messages according to prevailing myths and misconceptions and targeting women as well as other household and community decision-makers, the need to invest in the promotion of the national hotline and advocacy to ensure that laws protecting optimal IYCF practices in emergencies are enforced.

Background

Infants, young children and their mothers are vulnerable, particularly during humanitarian emergencies. Improving infant and young child feeding (IYCF) practices¹ according to the World Health Organization (WHO) recommendations is key to improving child survival and to promoting healthy growth and development. Rates of optimal IYCF practices in Lebanon are very low. Data shows that only 14.7% of infants less than six months of age are exclusively breastfed (Central Administration of Statistics, 2009) and around 13% of infants aged 6-23 months meet the minimum acceptable diet for complementary feeding (UNICEF, 2016). Field experience reveals that the main barriers to optimal breastfeeding in Lebanon include the lack of both awareness and a supportive environment for breastfeeding.

Ten years into the Syrian crisis, Lebanon remains the country hosting the largest number of refugees per capita. According to United Nations High Commission for Refugees estimates, there were 855,172 registered Syrian refugees dispersed across Lebanon by the end of March 2021.² The presence of such a large refugee population places enormous

strain on the country's economy, public services and local infrastructure. In addition, during the year 2020, the country went through severe economic challenges, exacerbated by the COVID-19 pandemic and the blast in the port of Beirut on August 4, 2020 that caused more than 200 fatalities and 6,500 injuries. During this succession of crises, ensuring optimal breastfeeding amongst refugees and the host community became an even greater priority given the importance of breastfeeding as a life-saving intervention.

Misconceptions and inadequate IYCF practices are commonly found among both refugees and Lebanese families. Programme staff often report that the introduction of water for thirst and tea for colic, illness or to relax the baby is customary and commonly initiated soon after birth. The early introduction of complementary foods is also customary with mothers commonly starting to give their infants small amounts of food from three to four months of age. Infant formula is also commonly given to infants soon after birth when mothers feel that they are not producing sufficient milk to meet their baby's needs. Women's reasons for discontinuing

breastfeeding include breast and nipple pain, latch difficulties, sleep deprivation and exhaustion. These difficulties are often compounded by maternal employment, inadequate family support or the lack of professional advice which are known barriers to breastfeeding success.

IYCF programming by International Orthodox Christian Charities in Lebanon

International Orthodox Christian Charities (IOCC) has been actively involved in nutrition-related activities in Lebanon both in schools and communities since 2001. Activities to improve IYCF practices have been prioritised both in normal times and in emergency situations, with specific IYCF-related activities targeted to both refugees fleeing conflict in Syria and vulnerable Lebanese families.

In 2011, a national IYCF programme was established by the Ministry of Public Health (MoPH), with support from IOCC and World Vision, and a sub-committee on IYCF in emergencies (IYCF-E) was created, mainly supported by IOCC. In 2018, the MoPH, with support from UNICEF and IOCC, developed and launched a National Policy on Infant and Young Child Feeding to guide actions to promote optimal IYCF to support the healthy growth and development of infants and young children in the country. The policy defines the responsibilities of the Lebanese government, its partners and all relevant stakeholders in promoting, protecting and supporting IYCF.

IOCC is a member of the IYCF national committee and works through the national IYCF programme to implement IYCF-related activities. Through its UNICEF-funded project launched in 2020, IOCC provides IYCF counselling and support to 10,000 pregnant and lactating women and through its team of community health educators, IOCC conducts education and awareness activities on optimal IYCF practices in all governorates to reach 9,000 caregivers. Mothers with lactation difficulties are referred to IOCC's pool of qualified and skilled lactation specialists who provide one-on-one counselling. Lactation specialists also provide support to ensure optimal IYCF practices in hospitals, primary healthcare centres and at community level.

¹ <https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding>

² UNHCR Operational Portal: <https://data2.unhcr.org/en/situations/syria/location/71>

Figure 1 IYCF counselling card adapted to COVID-19



In addition, IOCC monitors and supports hospitals in Lebanon enrolled in the Baby Friendly Hospital Initiative programme through on-the-job coaching and monitoring adherence to the '10 steps to successful breastfeeding', identifying and addressing challenges and supporting them towards certification with the Baby Friendly Hospital label from the MoPH. Other activities include the development of materials on complementary feeding and building the capacity of the healthcare providers working in nurseries to use these materials, as well as the monitoring of violations against the International Code of Marketing of Breast Milk Substitutes (BMS).

During the multi-faceted crisis that occurred in Lebanon, including movement restrictions as a result of COVID-19 imposed from March 2020, IOCC worked to adapt existing programming approaches to ensure that the most vulnerable pregnant and lactating women would be able to access IYCF support. Programmatic adaptations were made in line with the WHO, UNICEF and the Lebanese MoPH guidelines, supported by additional funds reallocated from existing programme budgets. This article outlines the programme adaptations made and lessons learned.

Programmatic adaptations

Promotion of optimal IYCF practices at community level

Initially, IOCC educators provided group education sessions on a daily basis, following a pre-defined curriculum of topics. Caregivers were gathered in one location and sensitised on IYCF topics. In the context of COVID-19, IOCC expanded its team of educators to reach more people and adapted its awareness activities to cover both IYCF and COVID-19. IOCC also mobilised volunteers across the country for a duration of two months to help and support the educators in awareness raising activities.

Based on the materials and guidelines developed at national level, existing educators and volunteers worked to raise awareness of IYCF and COVID-19 within their communities, targeting community members with key messages that aimed to limit the spread of the virus, mitigate its impact and correct misconceptions about IYCF in this context. They provided municipalities with preventive information and guidelines on home isolation, guidance on regular hand washing and hygiene, social distancing, the symptoms of COVID-19, when to seek medical care, how to buy groceries and disinfect them, when to use a face mask and how to use it appropriately as well as myth busters around IYCF/nutrition and COVID-19. Educators and volunteers helped to disseminate key national messages through the distribution of flyers and posters to shops, pharmacies and at household

Box 1 Case study of support provided to a breastfeeding mother during COVID pandemic

Samah, age 35, was unsuccessful in breastfeeding her first two children and was pregnant in her third trimester with her third child when she was diagnosed with COVID-19. Samah was not planning to breastfeed her baby and had heard a lot of myths and misconceptions around the need to avoid breastfeeding during the pandemic and to feed her infant with formula milk as a safer alternative. While still pregnant, Samah was approached by Amal, an IOCC lactation specialist. Amal helped to both improve Samah's knowledge about breastfeeding and build her confidence in her ability to breastfeed. She provided the mother and her partner with information about the benefits of breastfeeding, breastfeeding initiation and positioning, the importance of exclusive breastfeeding and the prevention and treatment of common breastfeeding problems.

Education and counselling sessions were conducted by Amal remotely through WhatsApp and Zoom. Amal also coordinated with the midwife at the hospital to ensure that Samah was supported to initiate breastfeeding within the first hour after her baby was born and that the baby was placed skin-to-skin on his mother's chest to encourage him to breastfeed more.

Amal then followed up closely with Samah through video calls following the birth to observe her

breastfeeding and provide support several times before she left the hospital. Although Samah experienced nipple soreness and bleeding and the physician suggested she use formula supplements, she continued exclusively breastfeeding, adjusting the latch and adopting good position to overcome the initial difficulties.

Later, when the time came for Samah to return to work, Amal counselled her, giving guidance on how to express and store her breastmilk and provided her with a manual pump. Samah said,

"We live in a culture where breastfeeding is undervalued and bottle feeding is viewed as the normal and safe way to feed babies, especially during this pandemic. I learned a lot from my experience with Amal. She helped me fix the breastfeeding difficulties I faced and corrected the misconceptions that I had about breastfeeding. She also helped me save money, which was good especially with the worsening economic situation. In addition, online consultations were highly convenient and time savvy; it was easy and fast to communicate with Amal by using WhatsApp. I'm still exclusively breastfeeding my baby. I now in turn raise awareness on breastfeeding and correct misconceptions within my community."

level, as well as through social media (including WhatsApp). They also advocated with local authorities and influencers (mayors, mukhtars and religious leaders) to engage in the dissemination of the key messages. Over two months, the volunteers were able to cover more than 120 of the 1,108 municipalities across the country.

Supporting mothers to practice optimal IYCF

As a response to the COVID-19 pandemic, IOCC lactation specialists began consulting and following up with pregnant and lactating women with either confirmed or suspected COVID-19 infection using the IYCF counselling card that was adapted for COVID-19 by UNICEF (Figure 1).

Box 1 provides an example of the support provided to a nursing mother. Support continued to be provided by lactation specialists for mothers with lactation difficulties referred by educators.

As a response to the COVID-19 emergency, alternative modalities to delivering support to mothers were put in place including the following:

- As many education and support sessions as possible were provided remotely over the phone, via social media or remotely through Zoom, Skype and/or WhatsApp.
- Where necessary and possible, individual meetings were conducted face-to-face while using personal protective equipment (PPE), physical distancing and frequent handwashing.
- The number of people attending awareness sessions in person was limited to five and sessions were conducted in open or well-ventilated areas with strict physical distancing measures and a requirement to wear face masks. As a result, the frequency of sessions was increased to enable the same or greater reach. When lockdown measures meant that approval needed to be given before sessions could be held, educators transferred to online modalities.
- The use of PPE, physical distancing and

frequent handwashing were adopted during all individual meetings.

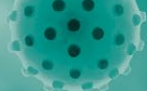
In support of the optimal nutrition of children aged 6-59 months, in 2020 IOCC also distributed micronutrient supplements to more than 5,000 vulnerable children in this age group. This was carried out through outreach at the community level conducted by the educators and lactation specialists. Supplementation targeted both refugee and vulnerable host community children and was carried out over this period in coordination with the Mother and Child Health Department of the MoPH and the Nutrition Sector.

Protecting IYCF through legislation

Despite the existence of a national law (Law 47/2008) that legislates upon the International Code of Marketing of BMS, IYCF is still undermined, particularly in emergencies. Due to the economic crisis, the COVID-19 pandemic, the heavy refugee burden and, in addition, the blast at the port of Beirut, calls for infant formula donations from the community increased. Several grassroots initiatives and organisations accepted donations and distributed these through a general distribution scheme without having the capacity or knowledge to follow global guidance for humanitarian aid.

IOCC identified the organisations and the formula milk providers involved and contacted them to provide them with legal information to ensure that artificial support was administered in line with the law.³ In addition, as a member of the IYCF national committee, IOCC supported the development of IYCF Standard Operating Procedures (SOPs) to guide and inform national and international agencies on how to ensure appropriate, timely and safe IYCF support for families. IOCC also contributed to the development of an infographic for the SOP to communicate information quickly and clearly, translated

³ The Law recommends that infant formula is strictly targeted to infants who require it and have no viable breastmilk options. <https://www.enonline.net/operationalguidance-v3-2017>



this into Arabic and disseminated it across agencies and sectors. IOCC then conducted workshops for organisations and small groups that were providing milk formula distribution to vulnerable families in all Lebanese governorates to inform them about the IYCF SOP, discussing how to provide nutrition support in a way that was in line with the global and international guidance on IYCF-E.

In coordination with the IYCF national committee, IOCC set up a IYCF hotline number to report violations of the BMS Code and to receive referrals for mothers in need of follow-up from lactation specialists. Various channels, including the development of a flyer and social media, were used to promote the hotline to agencies working across different sectors as well as caregivers. Infants and young children less than 24 months of age who were identified as needing support were referred for a full assessment conducted by a lactation specialist and given either skilled IYCF support or artificial feeding support as appropriate.

Discussion

The lockdown measures introduced in Lebanon in March 2020 to reduce the spread of COVID-19 resulted in a rapid change in circumstances for pregnant women, new mothers and their infants. Lactation specialists noticed that the changing and uncertain circumstances, the prevalence of misconceptions and myths surrounding breastfeeding and COVID-19, combined with reduced face-to-face support from family, friends and peers negatively affected women's perceptions and experiences of breastfeeding and their ability to overcome practical challenges. Furthermore, the deterioration of the economic situation and the loss of income associated with the closure of small businesses affected the ability of many families to purchase nutritious foods, altering the economic basis for infant feeding decisions. The prevailing context in Lebanon, where infant formula is regarded as an essential commodity and infant feeding with formula milks is regarded as 'normative', also presented extra challenges, driving the soliciting of donations of BMS and feeding equipment for untargeted distribution.

The government, UNICEF and professional health organisations were advised to maintain mother-infant contact and to encourage and support breastfeeding, including when a mother had COVID-19 provided she was well enough and precautions were taken to minimise transmission to her infant during feeding. Global and national guidance was released and IYCF programmes had to adapt quickly in order to provide scaled-up support to protect and promote optimal IYCF in this context.

Achievements

As a result of the programme adaptations by IOCC described in this article, between the end of February and the end of December 2020, lactation specialists were able to reach more than 11,000 pregnant and lactating women to provide them with IYCF counselling and support, as compared to around 3,000 in 2019. IOCC educators and volunteers were also able to reach more than 24,000 caregivers (compared to 1,500 in 2019) with education on IYCF especially in the context of COVID-19. This demonstrates a considerable growth in reach at this challenging

time, largely driven by the incredible effort of IOCC volunteers and staff, as well as the use of online platforms which enabled many women to be reached swiftly. In terms of the hotline, over 700 calls have been received since its launch in September 2020 with more than 85% of the calls being referred to a lactation specialist. Five violations of the BMS Code were reported through the hotline.

Challenges

A major challenge with working remotely was internet access. Some caregivers in rural areas had poor connections while others did not have any connection at all. This limited their ability to engage with some activities.

The programme adaptations described resulted in an increased workload, training needs and logistics within IOCC. Staff were provided with regular additional trainings on infection prevention and control measures to ensure they were able to share key messages and answer common questions on COVID-19. Many more materials were also developed, printed and distributed by IOCC which resulted in staff time and budget implications. To support this, the budget reallocations had to be done in coordination with the donor to support additional activities.

The surge in calls to the IYCF hotline proved challenging during 2020. In response, in 2021, two IYCF monitors were recruited to support the national IYCF hotline and meet the additional surge in needs.

Lessons learned and recommendations

Prior to the COVID-19 outbreak, IOCC worked on a preparedness plan that involved identifying resources, determining roles and responsibilities, developing policies and procedures and planning adaptations to programme activities in order to be able to respond promptly and effectively to a pandemic. This meant that the planned programme adaptations could be implemented swiftly after the first case of COVID-19 was confirmed in Lebanon. This kind of preparedness planning is essential in driving an appropriate emergency response. In future, greater alignment and coordination in mitigation plans across sectors (nutrition, health, food security and livelihoods, agriculture, water hygiene and sanitation, social protection and mental health and psychosocial support) is needed to improve the reach and support of all pregnant and lactating women and their infants and maximise opportunities across all services.

Despite the challenges, the merging of online support with in-person support enabled IOCC to reach a large number of pregnant and lactating mothers with essential IYCF support services in a short space of time. However, breastfeeding and complementary feeding practices in Lebanon remain poor. Along with the worsening economic situation and the increased demand for formula milk, programmes and services to protect, promote and support optimal feeding practices should remain a critical component of the programming and response for young children in the context of COVID-19 and more funding for IYCF-E activities is still needed. There is also a need to invest in the training and mobilisation of more community health volunteers to run IYCF-E activities at com-

munity level and lactation specialists to provide specialist counselling and support. Building the capacity and strengthening more health facility staff on IYCF-E counselling in the COVID-19 context is also needed to sustain the gains made and further scale up quality IYCF programming.

The understanding of myths and misconceptions related to IYCF and the tailoring of messages accordingly, and the inclusion of key decision-makers within the family structure (fathers, mothers-in-law) and influential members of society (midwives, doctors, dietitians, religious authorities, mayors), in awareness activities were important aspects of the programme. This should be considered by IYCF programmers going forward.

The IYCF hotline number provided another important platform for pregnant and lactating women to access remote support services. The hotline needs to be promoted to reach its full potential. The national IYCF committee, in coordination with the Lebanese government and UNICEF, is preparing a campaign on IYCF that aims to raise awareness on IYCF and promote the IYCF hotline with an official launch planned in June 2021.

IOCC and partner actions to address unethical breaches of the International Code of Marketing of BMS were a critical part of the response. Further advocacy is needed so that Law 47/2008, which aims to protect and promote breastfeeding, and the International Code of Marketing of BMS, are actually enforced in all emergency responses including during and after the COVID-19 pandemic. A legal framework supported by the MoPH is needed to ensure full adherence to the BMS Code to make sure that donations for and the marketing and promotion of formula milk are neither sought nor accepted.

Further recommendations are made for donors, embassies, international organisations, non-government organisations and grassroots organisations in a call for action that was developed by the Nutrition Sector in the response to the Beirut explosion.⁴

Conclusion

Adapting IYCF programme activities in the context of COVID-19 and the economic situation in Lebanon proved challenging. Progress has been made but programmes and services to protect, promote and support optimal early and exclusive breastfeeding and age-appropriate and safe complementary foods and feeding practices should remain a critical component of the programming and response for young children in the context of COVID-19. Coordination with other sectors is also needed to focus on reaching and prioritising pregnant and lactating women and infants and young children.

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⁴ Call for action on Infant and Young Child Feeding and Nutrition in the response to the Beirut port explosion, September 2020 - https://fscluster.org/sites/default/files/documents/lebanon_nutrition_taskforce_final.pdf

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Adaptations to SMART surveys in the context of COVID-19 in Cox's Bazar, Bangladesh

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Survey team leader taking anthropometric measurements, Cox's Bazar

BANGLADESH

What we know: Nutrition programming, including nutrition surveys, has faced significant disruption as a result of the restrictions in movement arising from the COVID-19 pandemic.

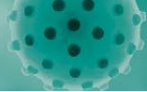
What this article adds: Adaptations to the Standardized Monitoring and Assessment of Relief and Transitions (SMART) survey methodology and operations were made in the context of Cox's Bazar refugee camps in Bangladesh during 2020 to enable data collection to continue in the COVID-19 context. Adaptations included reducing the number of indicators, reducing sample size, addressing myths and fears around COVID-19 through pre-survey community sensitisation; using experienced enumerators to shorten pre-survey training; and use of infection prevention control (IPC) measures by the survey team during the survey. Team members and household members were screened for COVID-19 symptoms regularly and excluded if symptoms were declared. The overall non-respondent rate was very low (5.4%-8.3%) and exclusions due to COVID-19 were low at 1.5%. Adaptations worked to allow the collection of high-quality data. An additional 3 to 5 minutes were required per household to allow for implementation of IPC measures. The experience shows that context-specific adaptations and community sensitisation and mobilisation can enable safe, quality data collection in the COVID-19 context.

Background

Cox's Bazar nutrition context

Cox's Bazar (CXB) is a highly disaster-prone coastal district in Bangladesh and one of 20 of Bangladesh's 64 districts identified as vulnerable with an estimated poverty prevalence rate of 16.6% (Government of Bangladesh, 2017). The CXB district has a host population of 2,290,000 and an additional estimated population of 871,924 refugees residing in 32 makeshift and two registered refugee camps across Ukhiya and Teknaf (sub-districts) (Government of Bangladesh-UNHCR, 2021). Since the influx of refugees in 1971, the Nutrition Sector in CXB has been providing comprehensive nutrition services to address the underlying causes of malnutrition across all camps targeting children under five years of age, children over five years of age, adolescent girls and pregnant and lactating women. Although the protracted crisis in CXB has stabilised to some extent, the COVID-19 pandemic has had a significant impact, limiting access to services, which has necessitated adaptations to nutrition programmes. Adaptations to community-based management of acute malnutrition (CMAM) programmes in CXB have been outlined in recent *Field Exchange* articles.¹

¹ <https://www.ennonline.net/fex/63/cmamcxbcovid19adaptations> and <https://www.ennonline.net/fex/63/cxbvitaminsupplementation>



Population representative nutrition surveys

Action Against Hunger (ACF) Bangladesh, with the support of ACF France, the ACF Canada SMART team and the ACF UK coverage team, regularly monitor the nutrition and health situations in both refugee camps and host communities. ACF currently leads the implementation of nutrition surveys in CXB and chairs the Nutrition Sector's Assessment and Information Management Technical Working Group (AIM-TWG). At the national level, ACF is supporting the formation of a National Assessment Technical Working Group. Since 2009, ACF has conducted 85 nutrition surveys in Bangladesh including 60 Standardized Monitoring and Assessment of Relief and Transitions (SMART) surveys, six rapid SMART surveys, six Standardized Expanded Nutrition Surveys (SENS), seven coverage assessments (SQUEAC/SLEAC), three Link Nutrition Causal Analyses (Link NCA) and three health facility assessments. Of these, 54 surveys were conducted in CXB.

SMART surveys by ACF Bangladesh collect data on anthropometry, mortality, morbidity, nutrition supplementation, food assistance, infant and young child feeding practices, food security and livelihoods and Water, sanitation and hygiene (WASH). The data collected informs the formulation of the joint response plan and multi-sector and integrated humanitarian interventions.

Following the release of interim global operational guidance on population level surveys and household level data collection in the COVID-19 context,² ACF Bangladesh, in consultation with the Nutrition Sector and government authorities, adapted the methodology for conducting SMART surveys and tested this in refugee camps and host communities in CXB between November 2020 and February 2021. The objective of this article is to capture the experiences and key lessons learned while implementing this interim guidance in three refugee camps to support its further development and implementation in other contexts given that most countries globally have to adapt their surveys due to COVID-19.

Adapting surveys in CXB in the COVID-19 context

Necessary technical, operational, logistical and HR adaptations were made in order to minimise the risk of COVID-19 transmission for the targeted surveyed populations and survey teams during the implementation of three SMART surveys. The assessment method was endorsed by the National Nutrition Services (NNS), the Institute of Public Health Nutrition (IPHN) through the CXB District Civil Surgeon's Office and the Office of the Refugee Relief and Repatriation Commissioner. All adaptations, outlined below, were comprehensively discussed and agreed in a series of meetings, webinars and email exchanges with AIM-TWG, the Nutrition Sector, NNS, the Civil Surgeon's Office and the global SMART team at ACF Canada and ACF France headquarters.

Methodology adaptations

The number of indicators collected was reduced

to include only those critical for programme decision-making including anthropometric data, a few health indicators and mortality data. Indicators related to food security, anaemia and health aspects, which are usually included, were omitted to simplify the approach and limit the interview time in order to reduce the contact time and minimise the risk of COVID-19 transmission.

For sampling, the precision level was kept at the minimum acceptable level as per the SMART guidance³ to limit the sample size thereby reducing further non-essential contacts with the population. A relatively higher non-response rate (NRR) was factored in for refugee populations (Makeshift camp:18%, Nayapara Registered camp:12% and Kutupalong Registered Camp: 18%) compared to similar past surveys to account for the possible refusal and exclusion of households due to COVID-19 related issues.

Operational adaptations

A number of adaptations were made to survey protocols as advised by global guidance, as follows:

Pre-survey training

- All survey enumerators, team leaders, survey managers and advisors were tested for COVID-19 (using a PCR test) three days prior to training.
- Adequate health and safety measures (use of personal protective equipment (PPE), health screening and maintaining proper physical distancing) were taken during training.
- A special session on the COVID-19 pandemic and necessary infection prevention control (IPC) measures was included in the training.

Survey implementation

- During field implementation, all survey team members were provided with surgical face masks and hand sanitiser. Measurer assistants were also provided with hand gloves to disinfect anthropometric equipment between interviews to avoid skin contact with disinfectant. Each team carried a safety disposal bag for used PPE which was properly disposed of at the end of data collection each day.
- All team members sanitised their hands immediately before entering a household and after completing each household data collection using alcohol-based hand sanitiser with at least 60% alcohol.
- During the interview, the interviewer and respondent maintained a distance of at least one metre (when possible in the confines of household spaces), even if wearing a mask, and the number of persons present during the interview was limited to a maximum of three. Respondents and all children over the age of two years were also given a mask to wear during the interview.
- Anthropometric measurements were mostly taken outside in an open, shaded area with enough space for proper physical distancing and air circulation.
- Anthropometric equipment (weighing scales, height boards and blank wooden boards) were disinfected between each household. New mid-

upper arm circumference (MUAC) tapes were used for each household and those previously used were left with each caregiver for use within the Family MUAC approach.⁴ Additional time was allocated to each house-hold to ensure safety measures could be carried out.

- Well-functioning vehicles with enough space were hired for the survey teams to ensure social distancing during the field travel and these were disinfected regularly. All drivers were also provided with a face mask and hand sanitiser.

In consultation with the AIM-TWG and government officials, additional measures over and above the global guidelines were also put in place to further reduce the risk of COVID-19 transmission for these specific surveys including those conducted in camps. Those additional adaptations were as follows:

Pre-survey preparations

- The COVID-19 situation was closely monitored and survey fieldwork was only permitted during periods when positive confirmed cases were low (according to the World Health Organization(WHO) Health Sector epidemiological update).
- Because of fear/stigma/mistrust due to COVID-19, extra efforts were made when conducting advocacy and sensitisation with camp leaders and camp-in-charges (government officials) and community mobilisation prior to the start of each survey. Special emphasis was placed on avoiding any confusion, misinformation, rumours and fear in the community, therefore ensuring maximum participation and cooperation both from the camp management and communities.
- While field testing the questionnaire and methodology, special emphasis was given to the team comprehension and appropriate implementation of IPC health and safety procedures (e.g., wearing PPE, ensuring physical distancing, administering COVID-19 screening checklist etc.) as those were introduced for the first time due to the pandemic.
- Coordination took place with the United Nations High Commission for Refugees (UNHCR) health unit to provide the necessary PPE for the survey team to avoid unwanted procurement delays.

Survey team measures

- The assessment mainly used highly experienced measurers (who had previously participated in at least two surveys and had passed the standardisation test in the last 12 months) in order to skip the standardisation test as recommended by the SMART interim guidelines in order to shorten the training period from five to three days to minimise risk.

² <https://smartmethodology.org/smart-survey-guidance-covid-19/>

³ SMART Manual 2.0, 2017 <https://smartmethodology.org/survey-planning-tools/smart-methodology/smart-methodology-manual/>

⁴ Family MUAC was already implemented within CXB whereby caregivers are trained to screen their own children for wasting using MUAC tapes with self-referral to nutrition centres if severe or moderate wasting is indicated.

**Table 1** Health screening checklist for survey team

	Conditions	Morning (Y/N)	Evening (Y/N)
Most common and mild symptoms	1. Did the staff and/or any team member have a high temperature ($\geq 100.4^{\circ}\text{F}/38^{\circ}\text{C}$) without a dry cough, tiredness?		
	2. Did the staff and/or any team member have high a temperature ($\geq 100.4^{\circ}\text{F}/38^{\circ}\text{C}$) with dry cough, tiredness?		
Mild and less common symptoms (treated from home)	3. Did the staff and/or any team member have a high temperature ($\geq 100.4^{\circ}\text{F}/38^{\circ}\text{C}$) without a sore throat, diarrhoea, conjunctivitis, headache, loss of taste or smell, aches and pains?		
	4. Did the staff and/or any team member have a high temperature ($\geq 100.4^{\circ}\text{F}/38^{\circ}\text{C}$) with a sore throat, diarrhoea, conjunctivitis, headache, loss of taste or smell, aches and pains?		
Serious symptoms (take immediate medical attention)	5. Did the staff and/or any team member have a running nose, sneezing, shortness of breath, chest pain or pressure, loss of speech or movement?		

- The number of survey enumerators was reduced to a minimum of three persons per team (one team leader and lead measurer, one measurer assistant and one interviewer) to limit exposure and allow physical distancing measures.
- An additional six team members were trained and kept on standby to recall at any point if a team member showed COVID-19 symptoms, was placed into quarantine or tested positive.
- All survey team members were put in a residential hotel with full board and were restricted from going outside and interacting with others during the whole training, field testing and data collection to minimise the risk of infection.
- All survey team members monitored their health using a health-screening checklist developed by ACF Bangladesh twice per day (morning and evening) during the survey period. If any individual met any of the conditions outlined in Table 1, they were requested to go into mandatory quarantine and were replaced by a member of the reserve team.

Participant screening

A standard health-screening checklist for interviewees was developed jointly in consultation with the Nutrition Sector and AIM-TWG members for the inclusion and exclusion of children and/or households. Body temperature was measured using an infrared digital thermometer and questions were asked as described in Table 2. If any household

met any of the four conditions as explained in Table 2, the household was excluded from the survey. If any household had multiple eligible children but at least one child without fever or other COVID-19 signs/symptoms and no other family history of COVID-19 infection, these households were included in the survey. Any other household members with a high fever or other signs or symptoms were asked to isolate from the survey team but this was not considered a household exclusion criteria.

Data collection and supervision

- Data was collected on tablets (Lenovo Tab) using the Open Data Kit (ODK) application to reduce the time spent entering data and to check for data quality. All teams carried a back-up tablet and hard copies of the questionnaire in the event of tablet failure.
- Survey teams were supervised daily using a supervision checklist with a minimum of one supervisor or survey manager per team on a rotating basis to ensure consistency in data collection across all teams. All data was uploaded and reviewed daily in order to monitor the quantity and quality of the data collected.
- A daily feedback session using a digital platform was held but reduced from 30 to 10 minutes.

Findings

All three surveys reached the sufficient number of households and children, well above the minimum requirement as per SMART survey guidelines (90% of clusters and 80% of children) to ensure data quality and representativeness (Table 3).

The overall NRR was very low (5.4 to 8.3%) and much lower than anticipated and used for the sample size calculation (12 to 18%) at the protocol development stage. Table 4 shows the different causes of non-response. This indicates that household exclusion due to COVID-19 exclusion criteria was very low (1.5%) in the Makeshift camp with no exclusions in the other two camps.

Although the original plan was to revisit non-response households for inclusion in the survey, this was not required as all three surveys had achieved adequate samples despite the exclusion of some households. The overall data quality for the three surveys was either “good” (Makeshift camp) or “excellent” (the two registered camps) as per the SMART plausibility score. The overall quality of the survey for the Makeshift camp was high but a penalty was given for a standard deviation (SD) of weight-for-height Z-score (WHZ) (SD value ≤ 0.8 ; acceptable) which was due to higher homogeneity in that camp.

Although there was no standardisation test used, most enumerators were highly experienced and skilled and therefore a high level of standardisation was assumed which resulted in very few outliers in the data.

Table 2 Health screening checklist for household inclusion/exclusion

Conditions	Response (Y/N)
1. Did eligible children (6-59 months) have a high temperature ($\geq 100.4^{\circ}\text{F}/38^{\circ}\text{C}$) and/or others symptoms of COVID-19 (e.g., dry cough, sneezing, shortness of breath, chest pain or pressure, loss of speech or movement etc.?)	
2. Did anyone in this household test positive for COVID-19 within the past 14 days?	
3. Was anyone in this household in close contact with a confirmed COVID-19 positive patient within at least 14 days?	
4. Is anyone in this household currently in home or centre quarantine for isolation?	

Table 3 Proportion of households and children included in SMART surveys

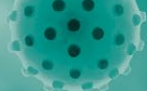
Survey location	Targeted ⁵ households	Households achieved	Targeted children	Children achieved	Non-response rate (NRR)
Makeshift camp	611	578 [94.6%]	492	488 [99.2%]	33 [5.4%]
Nayapara registered camp	585	552 [94.4%]	362	305 [84.3%]	33 [5.6%]
Kutupalong registered camp	709	650 [91.7%]	334	346 [103.6%]	59 [8.3%]

Table 4 Distribution of non-response households by cause

Survey area	Absent	Refused	Excluded due to children's high fever	Others*	Total non-response rate (NRR)
Makeshift camp	23 [3.8%]	0 [0%]	9 [1.5%]	1 [0.1%]	33 [5.4%]
Nayapara registered camp	7 [1.2%]	1 [0.2%]	0 [0%]	25 [4.3%]	33 [5.6%]
Kutupalong registered camp	26 [3.7%]	33 [4.6%]	0 [0%]	0 [0%]	59 [8.3%]

*Wrong address/moved to another place

⁵ The sample size was calculated using ENA for SMART software based on different parameters. A two-stage cluster sampling technique was applied in the Makeshift camp whereas a simple random sampling technique was applied in the two-registered camps.



The data collection time of 15 minutes for each household, as recommended by the SMART operational guidelines, was not feasible in this context. A minimum of 20 to 25 minutes was required on average per household with the anthropometry and mortality components. Administration of the health screening checklist, measuring of body temperature, asking/putting on masks for household members and disinfecting equipment added to the time required. There was no refusal related to fear of COVID-19 and health and safety measures were well accepted by community members. Almost all households already had facemasks and other PPE that they were willing to use. However, it was often very challenging to maintain a distance of at least one metre especially in the Makeshift camp due to the very limited space available in and around the households.

All survey team members tested negative for COVID-19 prior to the survey and no one developed other signs/symptoms of COVID-19 or became unwell during the survey implementation.

Reflections and key lessons learned

Weighing up the risks and benefits of conducting surveys during the COVID-19 pandemic is important. That was aided in this experience by a

thorough series of discussions with Nutrition and Health Sector partners and local health and administration authorities and a constant review of local epidemiological trends around COVID-19. Gaining an understanding of the local context and community perceptions around COVID-19, including stigma, fear and misconceptions, was also important prior to embarking on the survey in this context. This understanding informed community sensitisation prior to the survey and communications during the fieldwork which led to a high level of community compliance with the survey. The selection of locally experienced, skilled enumerators who could understand the context was also important.

There is a high risk that excluding children and households due to high fever will pose a systematic bias by also excluding potentially malnourished children. This could impact the reported malnutrition prevalence and other relevant indicators since there is a general assumption that sick children are more likely to be malnourished. This is unlikely to have affected the results of the three surveys here, given that the exclusion rate was very low, but should be considered as a potential source of bias in SMART surveys in other contexts where COVID-19 rates are higher.

In terms of measures used during the conducting of surveys, several adaptations were made to the interim guidance based on a series of discussions and consultation with the Nutrition Sector, AIM-TWG, NNS, IPHN, the local Civil Surgeon's Office as well as ACF Canada and France headquarters advisors. Since the COVID-19 crisis was new for everyone and there was a great deal of sensitivity around conducting surveys in this period, a large number of stakeholders were hesitant to embark on the process. A lot of the additional recommendations therefore came from multiple partners, organisations and technical experts which were added to the global guidance particularly for the specific CXB context but which would not necessarily be needed in other settings.

The interim guidelines on SMART surveys recommend the use of both hand gloves and sanitiser for team members. However, using both items proved to be time consuming, resource-heavy and had the potential to create an extra waste management burden at field level. It was therefore decided to only use hand sanitiser (aside from the use of gloves for those cleaning equipment) so as to reduce the resources needed. This appeared to have no negative impact on transmission rates in the context of these three surveys.

Box 1 Recommendations to implement SMART surveys in the context of COVID-19

Pre-survey preparation

1. Critically review and monitor the COVID-19 situation in the context before embarking on a decision to conduct a SMART or other population level survey that requires household level data collection.
2. Inform and consult with local authorities (e.g., local government, law enforcement authorities, camp management committees and the Health and Nutrition Sectors) prior to conducting any survey during the COVID-19 pandemic. This is particularly important during the pandemic as internal and in-country rules and regulations may be imposed including movement restrictions due to the pandemic. Consultation with the relevant authorities is critical to gain the necessary approvals and full cooperation to successfully conduct the survey.
3. Use local in-country expertise in technical and management survey aspects wherever possible to ensure both quality data collection and the community's health and safety in the COVID-19 context.
4. Invest in community mobilisation and advocacy prior to the survey to address rumours and misinformation around COVID-19 in the community.
5. Adequate funding and time should be planned for the proper adaptation of IPC health guidance, the procurement of necessary disinfectant and PPE items and any unforeseen contingency measures required to make the survey as safe as possible in the COVID-19 context.
6. Organisations and the Sector/Cluster should focus on the minimum key indicators required in the survey questionnaire to enable sufficient nutrition situation monitoring and evaluation and decision-making in the context. All additional non-essential indicators should not be included in surveys implemented in the COVID-19 context to reduce exposure time to the survey population and households.
7. Carefully adapt and contextualise the global guidance (e.g., interim global operational guidance on population level surveys and household level data collection in the COVID-19 context) with a group of experts through a technical committee (e.g., AIM-TWG, Sector/Cluster) to ensure that the guidelines suit the unique context in which they are being applied.
8. The NRR should be carefully estimated during sample size calculations. Child fever prevalence based on a two-week recall period should not be directly used for COVID-19 related NRR for sample size calculations as it may unnecessarily inflate the NRR.

Survey implementation

9. Review the allocated time per household based on field testing while taking into consideration extra time for health screening and IPC measures during household visits.
10. Very close monitoring of daily survey field activities by the responsible survey manager is needed to ensure adherence to IPC guidance, data quality, the health and wellbeing of the survey team members and the number of non-responses either due to COVID-19 related rejection or exclusion.
11. Additional survey days (e.g., two to three days) should be planned for during the COVID-19 pandemic to revisit all missed or excluded households either due to high fever or absenteeism. This will minimise the possible high NRR that may happen if many children and/or mothers/caregivers are found with fever on the designated days of data collection.

Experience from this survey showed that the standard facemask size was difficult to use with children. The recommended 15 minutes allocated for each household was not adequate to complete the anthropometry and mortality components of the survey and apply IPC measures. On the basis of this experience, several recommendations are made to partners who would like to conduct SMART surveys in COVID-19 context, as described in Box 1.

Conclusion

Experience from conducting three SMART surveys in the context of COVID-19 in CXB showed context-specific adaptations can enable the proper application of SMART survey guidelines. In this context, community mobilisation that took into account prevailing community COVID-19 myths and concerns prior to the survey enabled a good response rate and IPC measures prevented virus transmission among respondents and survey team members. This enabled the collection of information to inform the nutrition response. It is recommended that surveys continue to be conducted despite the extra efforts and resources needed to minimise the risk of virus transmission.

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The burden of malnutrition and fatal COVID-19: A global burden of disease analysis

Research snapshot¹

The role played by population-level nutritional status in the vulnerability of countries to COVID-19 illness and death is unknown. Because childhood malnutrition is associated with high morbidity and mortality, mainly due to infectious diseases, it can be assumed that undernourished populations may be at greater risk of severe or fatal COVID-19 illness. This study aims to identify

the countries where a high burden of malnutrition coincides with higher rates of fatal COVID-19 disease, indicating a potential relationship between these burdens. Analyses were conducted for 172 countries for which data were available on both COVID-19 case fatality ratios (CFR) and the country-level burden of malnutrition, quantified using death rates for child growth failure (underweight, stunting and/or wasting),

years lived with disability (YLD) attributed to iron and vitamin A deficiencies and high body mass index (BMI).

There was no correlation between the rate of death for child growth failure and CFR for COVID-19. A slightly higher CFR for COVID-19 was seen in countries with very high rates of YLD for iron deficiencies. Countries' vulnerability to fatal COVID-19 was slightly higher with increasing rates of vitamin A deficiency, with no further increases for countries with very high rates of vitamin A deficiency. Vulnerability to fatal COVID-19 was slightly higher in countries with increased rates of high BMI compared to countries with low and median rates of high BMI. No correlations were seen between the rate of YLD for high BMI and CFR for COVID-19. Increasing rates of high BMI were, however, associated with a higher vulnerability to fatal COVID-19 in low-income countries.

Countries ranking high on at least three malnutrition indicators and with elevated CFR for COVID-19 are sub-Saharan African countries, namely, Angola, Burkina Faso, Chad, Liberia, Mali, Niger, Sudan and Tanzania as well as Yemen and Guyana. The authors conclude that population-level malnutrition appears to be related to increased rates of fatal COVID-19 in areas with an elevated burden of undernutrition such as countries in the Sahel strip.

¹ Mertens, E and Peñalvo, J L (2021) The burden of malnutrition and fatal COVID-19: A global burden of disease analysis. *Front. Nutr.* 7:619850. doi: 10.3389/fnut.2020.619850



A child being assessed for malnutrition at a nutrition center in North Darfur, Sudan

Improving complementary feeding practices through smartphone-based maternal education in Iran

Research snapshot¹

Mothers' poor nutrition-related knowledge, attitudes and practices are considered to be major causes of malnutrition in children, along with socio-economic and environmental factors. The growing ownership of smartphones offers a cost-effective platform to provide evidence-based health information and behavioural change interventions. Researchers assessed whether providing mothers with nutritional education through a smartphone application would have an effect on child undernutrition in a food-secure environment over a period of six months.

Children under three years of age with moderate or severe malnutrition ("wasting", defined by weight-for-height z-score (WHZ) <-2) and/or underweight (defined by weight-for-age z-score (WAZ) <-2) and/or stunting (defined by height-

for-age z-score (HAZ) <-2) were recruited with their mothers in a well-child clinic in Urmia, Iran. The children and mothers were randomly assigned to either the intervention group (smartphone-based maternal nutrition education covering principles based on child age, child feeding behaviour, timing and appropriate introduction of complementary feeding and mothers' health) or the control group (routine health service treatment as usual which included the provision of standard nutrition information during regular check-ups).

Between baseline and endline, mothers in the intervention group showed greater and statistically significant improvement in the three indicators of nutrition literacy (critical knowledge, feeding attitudes and nutritional practice) compared to the women in the control group. Children in the intervention group showed greater positive

change compared to the control group in their nutrition status: WHZ increased by $+0.34 \pm 0.26$ ($p < .05$), WAZ increased by $+0.35 \pm 0.20$ ($p < .05$) and HAZ increased by $+0.34 \pm 0.21$ ($p < .05$). More children in the intervention group recovered from wasting (WHZ <-2) and underweight (WAZ <-2) than children in the control group ($p < .05$) while no statistically significant change was observed for stunting (HAZ <-2). At endline, 6% of the children were wasted in the intervention group compared with 32% in the control group.

The six-month smartphone-based maternal nutrition education programme on complementary feeding was more effective than standard routine nutrition information for correcting wasting and underweight among children under three years of age in middle-income food-secure communities. Although HAZ status improved, stunting rates did not which can be explained by the relatively short intervention period.

¹ Seyyed, N, Rahimi, B, Eslamlou, H R F, Afshar, H L, Spreco, A and Timpka, T (2020) Smartphone-Based Maternal Education for the Complementary Feeding of Undernourished Children Under 3 Years of Age in Food-Secure Communities: Randomised Controlled Trial in Urmia, Iran. *Nutrients*, 12(2), 587. doi:10.3390/nu12020587

Misalignment of global COVID-19 breastfeeding and newborn care guidelines with World Health Organization recommendations

Research snapshot¹

Interruption of exclusive and continued breastfeeding is responsible for nearly 700,000 maternal and child deaths annually. There are concerns that the separation of mothers and newborns to reduce mother-to-infant transmission of SARS-CoV-2 in the context of the COVID-19 pandemic is negatively affecting breastfeeding practices. A strategy for preventing the spread of the virus responsible for COVID-19 is to separate those who are infected from those who are not infected. In newborns, the risk posed by virus transmission must be weighed against the protection that breastfeeding provides. The World Health Organization (WHO) issued guidance for mothers suspected or confirmed as having COVID-19 and their newborns which supported maintaining mother and infants proximate to one another and early and exclusive breastfeeding.

This study reviewed guidance documents from 33 countries to assess their alignment with the WHO recommendations and the extent to

which the policy supported or undermined breastfeeding, namely (1) skin-to-skin contact, (2) early initiation of breastfeeding, (3) rooming-in, (4) direct breastfeeding, (5) provision of expressed breastmilk, (6) provision of donor human milk, (7) wet nursing, (8) provision of breastmilk substitutes, (9) psychological support for separated mothers and (10) psychological support for separated infants.

The findings showed that none of the guidance from the 33 countries recommended all aspects of the WHO guidance and most countries did not recommend keeping mothers and infants in close proximity or direct breastfeeding. Recommendations against practices supportive of breastfeeding were common, even in countries with high infant mortality rates. Decisions related to maternal and newborn proximity and breastfeeding have been based on other prominent organisations whose early guidance was based on fear of the unknown (the virus) instead of the standard practices and knowledge of past

viral epidemics of the WHO.

The authors recommend that those developing guidance need to appropriately consider the importance of skin-to-skin contact, early initiation of breastfeeding, rooming-in and breastfeeding to maternal and infant physical and psychological health. The implications of these acute changes in infant feeding practices, microbiomes, overall infant morbidity and mortality, maternal health and other unforeseen changes will remain unknown for a long time. Recommendations against maternal proximity and breastfeeding should therefore not be made without compelling evidence that they are necessary and less harmful than maintaining dyad integrity.

¹ Vu Hoang, D, Cashin, J, Gribble, K et al. (2020) Misalignment of global COVID-19 breastfeeding and newborn care guidelines with World Health Organization recommendations. *BMJ Nutrition, Prevention & Health* 3(2): 339-350. doi:10.1136/bmjnp-2020-000184

The Lancet Series on Maternal and Child Undernutrition Progress

Research snapshot¹

Thirteen years after the first Lancet Series on Maternal and Child Undernutrition, the latest series on Maternal and Child Undernutrition Progress revisits the global agenda for tackling undernutrition. It explores key advancements made on stunting, wasting and micronutrient deficiencies and lays out an 'agenda for action' to accelerate progress towards global nutrition goals. The series serves as an important milestone and a key moment to reinvigorate the nutrition agenda in 2021 as part of the Nutrition for Growth Year of Action.

The first paper, by Victora et al, reviews progress on undernutrition in 50 low- and middle-income countries using data from 2000 to 2015. It found that the prevalence of childhood stunting has fallen (from 32.5% in 2000 to 21.9% in 2017) but progress on wasting and low birth-weight (LBW) has been slow. New evidence has shown that 4.7% of children are affected by both wasting and stunting, a condition associated with a 4.8 times increase in mortality and that both wasting and stunting can exist at birth and peak in the first six months of life.

Among women of reproductive age, the prevalence of low body-mass index has reduced but the prevalence of short stature remains high. Data on micronutrient status is limited, particularly for women, but evidence has shown improvements in vitamin A status. The prevalence of zinc defi-

ciency and anaemia remain high. The paper further highlights the role of social inequalities in undernutrition and that the modest improvements made since 2000 may be offset by the COVID-19 pandemic. (Victora et al, 2021)

The second paper, by Keats et al, explores updated evidence on interventions to address maternal and child malnutrition, examining both direct and indirect interventions and offering a revised framework for nutrition actions. The evidence collected supports the continued effectiveness of all the interventions outlined in the 2013 Lancet Series. Evidence has strengthened for the effectiveness of antenatal multiple micronutrient supplementation in reducing the risks of stillbirths, LBW and babies born small-for-gestational age and there is emerging evidence for preventative small-quantity lipid-based nutrient supplementation (SQ-LNS) for reducing childhood stunting, wasting and underweight. However, evidence gaps remain on how to tackle malnutrition in school age children and adolescents. Overall, greater efforts are needed to improve intervention coverage. (Keats et al, 2021)

The third paper, by Heidkamp et al, outlines steps that must be taken if the 2025 World Health Assembly targets and the 2030 Sustainable Development Goals are to be met. It reaffirms the importance of multi-sector actions and the emphasis on the first 1,000 days. The paper

highlights several direct nutrition interventions that are ready for scaling up in health systems. However, it stresses the need for well-resourced nutrition data and information systems to inform approaches. The authors also note the need for more evidence on cost-effectiveness to allow governments to plan sufficiently for implementation and scale-up. The paper concludes with a call to action for nutrition stakeholders to unite around common priorities to tackle the so-called 'unfinished undernutrition agenda'. (Heidkamp et al, 2021)

In an accompanying commentary to the Lancet Series, Shekar et al explore progress in light of the COVID-19 pandemic and call for renewed efforts to support countries to prioritise interventions to be delivered at scale. (Shekar et al, 2021)

¹ <https://www.thelancet.com/series/maternal-child-undernutrition-progress>

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- Heidkamp, R A et al (2021) "Mobilising evidence, data, and resources to achieve global maternal and child undernutrition targets and the Sustainable Development Goals: an agenda for action." *The Lancet* 397(10282): 1400-1418.
- Keats, E et al (2021) "Effective interventions to address maternal and child malnutrition: an update of the evidence." *The Lancet Child & Adolescent Health* 5(5): 367-384.
- Shekar, M et al (2021) "Maternal and child undernutrition: progress hinges on supporting women and more implementation research." *The Lancet* 397(10282): 1329-1331.
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Sustainability evaluation of a national infant and young child feeding programme in Bangladesh and Vietnam Research snapshot¹

Numerous infant and young child (IYCF) interventions have struggled to show impact at-scale. A notable exception is the Alive & Thrive initiative (A&T) implemented in Bangladesh, Ethiopia and Vietnam between 2009 and 2014. The A&T programme aimed to achieve at-scale child nutrition and health improvements via contextualised activities including nutrition counselling, policy change, social mobilisation and mass media campaigns with studies showing that IYCF behaviours and outcomes improved as a result. This study aimed to explore the sustainability of activities implemented during

the A&T programme in Bangladesh and Vietnam, two years after the end of external programme funding.

The study design included quantitative data (surveys completed by 668 health workers and 269 service observations) collected from January to May 2017 and comparative data analysis from areas that received all A&T programme activities and those that received no A&T-related activities. Interviews and focus group discussions were held with 218 stakeholders (policymakers, experts, non-governmental organisations and donor representatives and health partners) to explore their impressions of A&T programme sustainability.

In both countries, some A&T activities were continued via institutionalisation following project closure, particularly IYCF counselling. However, declines in mass media campaigns, policy and advocacy activities and social mobilisation activities were noted. Certain core A&T activities, such as monitoring and evaluation and IYCF training, were reduced in both countries in frequency, quality and coverage. Time and budget constraints were cited as barriers to implementing these core A&T activities.

When exploring health worker capacity across intervention and comparison areas, it was found that IYCF knowledge scores remained significantly higher among health workers in intervention areas compared to those in comparison settings (on average 11% and 14% higher respectively). However, this did not translate into better quality of counselling as determined by the proportion of recommended activities performed. Health workers in intervention areas in Bangladesh reported significantly higher job satisfaction (86%) and self-efficacy (93%) than those in comparison areas (83% and 85% respectively). No significant differences were noted in Vietnam. Stakeholders highlighted the importance of government leadership for sustainability and the need for future programmes to plan for institutionalisation from the beginning of implementation.



IYCF messaging in Bangladesh

¹ Moucheraud, C, Sarma, H, Ha, T T T et al. (2020) Can complex programs be sustained? A mixed methods sustainability evaluation of a national infant and young child feeding program in Bangladesh and Vietnam. *BMC Public Health* 20, 1361 (2020). <https://doi.org/10.1186/s12889-020-09438-2>

Nutrition data use and needs: Findings from an online survey of global nutrition stakeholders

Research snapshot¹

Information on population-level nutritional status and nutritional determinants are typically collected through periodic national and sub-national surveys. However, there is growing global demand for improved country-level nutritional data. To justify investment for improved data collection, evidence of the demand for information is needed. To fill this gap, the authors conducted an online survey of nutrition professionals working in low- and middle- income countries to identify the nutrition indicators and data sources widely used and the current unmet nutrition information needs.

The online survey was disseminated through professional networks and online nutrition-focused listservs. Respondents were asked their professional background, how they use data in

their work, which nutrition indicators and data sources they had accessed in the previous year and unmet data needs. The survey was completed by 235 respondents, the majority of whom were from non-governmental organisations and research entities. Few government officials responded to the survey.

Of those who accessed country-specific data in the last year, Demographic and Health Surveys (DHS) were the most common (74%) followed by Multiple-Indicator Cluster Surveys (MICS). Most respondents had accessed at least one source of consolidated data in the last 12 months (75%) of which the most common was the Global Nutrition Report (GNR). Routine facility data sources such as the Health Management Information System (HMIS) were less accessed compared to household surveys.

Respondents with a multi-country focus were more likely to have accessed both the DHS and the GNR in the last year (85% and 82% respectively) compared to those with a single-country focus (60% and 66% respectively) ($P < 0.001$; $P = 0.014$ respectively). The most commonly accessed indicators overall were the prevalence of exclusive breastfeeding (69%), child minimum dietary diversity (66%), stunting (65%) and wasting (65%).

Identified gaps in data include diet quality indicators, nutrition-sensitive intervention coverage and infant and young child feeding promotion coverage. Data challenges noted by the respondents were the lack of geographical disaggregation of data (82%), the lack of data for demographic groups (77%) or data being out of date (77%). Results point to the continued need for timely, high-quality nutrition data and greater investment in surveys.

¹ Buckland, A J, Thorne-Lyman, A L, Aung, T, King, S E, Manarat, R, Becker, L, Piwoz, E, Rawat, R and Heidkamp, R (2020). Nutrition data use and needs: Findings from an online survey of global nutrition stakeholders. *Journal of global health*, 10(2), 020403. <https://doi.org/10.7189/jogh.10.020403>

An exploration of district-based health decision-making in West Bengal, India

Research snapshot¹

Since 2005, health planning has been increasingly decentralised in India, through the Health Sector Reform Programme and the National Health Mission, leading to increased district-level health decision-making and the integration of health plans into multiple sectors. This qualitative study aimed to assess health decision-making processes in two districts in West Bengal, exploring the extent to which local data is used for decision-making, planning and resource allocation for maternal and child health across health-related sectors.

Direct observations of four key decision-making meetings and qualitative interviews with 16 key informants from multiple departments were conducted between June and October 2015.

Data templates contributing to the Health Management Information System (HMIS) were also collected to understand the types of data available and data-sharing mechanisms. Findings were subsequently triangulated thematically based on the World Health Organization's health system building blocks.

Findings revealed that, despite decentralised planning being one of the pillars of India's Health Sector Reform Programme, health plans and resource allocations have remained structured around the State and Central Government's core agenda rather than district-level priorities. The contribution to decision-making by other departments is limited as programmes are already planned according to the State Government's

health agenda. The analysis of data templates revealed no harmonisation or sharing of data across departments. In observed district health meetings, 21 issues were discussed and action plans developed. Yet, despite data being available for all of these issues, decisions on only nine (such as institutional delivery and immunisation services) were based on available data. Discussions about infrastructure and supplies were not supported by data and planning targets were not linked to health outcomes. Findings show that existing local data is underutilised for decision-making. This highlights the need for strengthening the use of data for priority-setting and follow-up at district-level in India.

¹ Bhattacharyya, S, Issac, A, Girase, B, Guha, M, Schellenberg, J, Iqbal Avan, B (2020) "There Is No Link Between Resource Allocation and Use of Local Data": A Qualitative Study of District-Based Health Decision-Making in West Bengal, India. *Int J Environ Res Public Health*. 2020;17(21):8283. Published 2020 Nov 9. doi:10.3390/ijerph17218283

Greater precision of interactions between community health workers and household members to improve maternal and newborn health outcomes in India

Research snapshot¹

In low- and middle-income countries, community health workers (CHWs) provide basic but lifesaving support for those who have little access to formal healthcare. To identify which CHW actions and messages enable good outcomes and respectful care, the authors used logistic regression to study the associations between CHW actions and household behaviours during antenatal, delivery and postnatal periods in Uttar Pradesh, India. This large-scale survey was conducted in the context of a mature government programme which has operated at scale nationally, using close to a million CHWs, for 15 years. Data was collected on a uniquely linked set of questions on behaviours, beliefs and care pathways from recently delivered women

(n=5,469), their husbands (n=3,064), mothers-in-law (n=3,626) and CHWs (n=1,052).

Results show that pregnant women who were visited earlier in pregnancy and who received multiple visits were more likely to perform recommended health behaviours including attending multiple check-ups, consuming iron and folic acid tablets and delivering in a health facility, compared to women visited later or receiving fewer visits. Counselling the woman was associated with the higher likelihood of attending three or more check-ups and consuming 100+ iron and folic acid tablets, whereas counselling the husband and mother-in-law was associated with higher rates of delivery in a health facility. Certain be-

haviour change messages, such as the danger of complications, were associated with more check-ups and delivery in a health facility but were only used by 50%–80% of CHWs. During delivery, 57% of women had the CHW present and their presence was associated with respectful care, early initiation of breastfeeding and exclusive breastfeeding but not with delayed bathing or clean cord care. Home visits after delivery were associated with higher rates of clean cord care and exclusive breastfeeding. Counselling the mother-in-law (but not the husband or woman) was associated with exclusive breastfeeding.

CHW presence, the number and the timing of visits, behaviour change messaging strategies and a focus on specific household members for different behaviours were associated with better maternal and newborn care practices in this context. Understanding the perspectives of the household decision makers, emphasising the importance of home visits and identifying what messages are shared helped to identify ways to increase the impact of CHW home visits.

Programme managers can use these insights to adapt CHW training, incentives and tools to achieve greater impact, understanding that it is not just the skills of the CHW but the trust between the CHW and the beneficiary built up over time that is important.



¹ Smittenaar, P, Ramesh, B M, Jain, M, Blanchard, J, Kemp, H, Engl, E et al (2020) Bringing Greater Precision to Interactions Between Community Health Workers and Households to Improve Maternal and Newborn Health Outcomes in India. *Global health, science and practice*, 8(3), 358–371. <https://doi.org/10.9745/GHSP-D-20-00027>

Effect of nutrition-sensitive agriculture interventions on maternal and child nutritional outcomes in rural Odisha, India (UPAVAN trial)

Research snapshot¹

Almost a quarter of the world's undernourished people live in India. The investigators tested the effects of three nutrition-sensitive agriculture (NSA) interventions on maternal and child nutrition in the Keonjhar district of Odisha State in India. Clusters of villages were randomised to one of four arms:

- 1) Women's group meetings and household visits occurring each fortnight over 32 months using NSA videos (AGRI group)
- 2) As above but combining NSA and nutrition-specific videos (AGRI-NUT group)
- 3) Fortnightly women's group meetings using NSA videos and nutrition-specific participatory learning and action (PLA) cycle meetings and videos (AGRI-NUT+PLA group)
- 4) Control group (no intervention)

These components have been implemented separately in several low-income settings but this was the first trial to test different combinations of these approaches. Anthropometry and dietary diversity outcomes were assessed in children aged 6-23 months and their mothers through cross-sectional surveys at baseline (November 2016) and at endline (November 2019).

Compared with the control group, there was an increase in the proportion of children consuming at least four of seven food groups in the AGRI-NUT (adjusted relative risk [RR] 1.19, 95% CI 1.03 to 1.37, $p=0.02$) and AGRI-NUT+PLA (1.27, 1.11 to 1.46, $p=0.001$) groups

but not in the AGRI group. There was an increase in the proportion of mothers consuming at least five of ten food groups in the AGRI (adjusted RR 1.21, 1.01 to 1.45) and AGRI-NUT+PLA (1.30, 1.10 to 1.53) groups compared with the control group but not in AGRI-NUT. There were no effects on child wasting or on mean maternal Body Mass Index (BMI).

The authors conclude that women's groups using combinations of NSA videos, nutrition-specific videos and PLA cycle meetings improved maternal and child diet quality in rural Odisha,

India. Future efforts could consider integrating similar interventions within larger scale, multi-sector programme designs to increase impact. However, child wasting continues to be a problem and innovation in the prevention of child wasting is an urgent priority.

¹ Kadiyala, S, Harris-Fry, H, Pradhan, R, Mohanty, S et al (2021) Effect of nutrition-sensitive agriculture interventions with participatory videos and women's group meetings on maternal and child nutritional outcomes in rural Odisha, India (UPAVAN trial): a four-arm, observer-blind, cluster-randomised controlled trial. *Lancet Planetary Health*. 2021;in press. Published 2021 Mar 31. doi: 10.1016/S2542-5196(21)00001-2



Home-based nutrition gardens and backyard poultry, India

Biannual azithromycin distribution and child mortality among malnourished children in Niger

Research snapshot¹

Biannual azithromycin distribution has been shown to reduce child mortality as well as increase antimicrobial resistance. The authors assessed whether this effect differed according to underweight status in a high-mortality setting in West Africa. Children received biannual distribution of azithromycin or a placebo over two years in a large, randomised control trial in Niger. In this analysis, the effect of azithromycin distribution on child mortality was assessed for underweight subgroups using weight-for-age z-score (WAZ) thresholds of -2 and -3 in 27,222 children between one and 11 months of age who had their weight measured at their first study visit. Mortality was defined as the community mortality rate (deaths per 1,000 person-years at risk). Modification of the effect of azithromycin on mortality

by underweight status was examined on the additive and multiplicative scale and the absolute number of deaths averted with azithromycin in each subgroup was estimated.

The communities assigned to azithromycin had lower mortality rates than those assigned to the placebo (-12.6 deaths per 1,000 person-years (95% CI -18.5 to -6.9 , $P < 0.001$)). Reductions were larger among children with lower WAZ: -17.0 (95% CI -28.0 to -7.0 , $P = 0.001$) among children with WAZ < -2 and -25.6 (95% CI -42.6 to -9.6 , $P = 0.003$) among children with WAZ < -3 . The estimated number of deaths averted with azithromycin was 388 (95% CI 214 to 574) overall, 116 (95% CI 48 to 192) among children with WAZ < -2 and 76 (95% CI 27 to 127) among children with WAZ < -3 .

Although the absolute reduction in mortality between arms appears larger in both underweight groups, no statistically significant evidence of effect modification was demonstrated by the WAZ subgroup on either the additive or multiplicative scale. Based on these results, the authors conclude that the treatment of all children aged between one and 11 months would save five times as many lives as restricting treatments only to children with a WAZ < -3 . In this setting, the number of deaths averted would be greatest if all children were treated with azithromycin, regardless of nutritional status.

¹ O'Brien, K S, Arzika, A M, Maliki, R, Manzo, F, Mamkara, A K, Lebas, E, et al (2020) Biannual azithromycin distribution and child mortality among malnourished children: A subgroup analysis of the MORDOR cluster-randomized trial in Niger. *PLoS Med* 17(9): e1003285. <https://doi.org/10.1371/journal.pmed.1003285>

² An additive interaction contrast greater than 0 indicates the joint effect of receiving placebo and being underweight is greater than the sum of the individual effects considered separately. A multiplicative interaction contrast greater than 1 indicates the joint effect of receiving placebo and being underweight is greater than the product of the individual effects considered separately.

Analysis of gestational weight gain using nationally representative data

Research snapshot¹

Adequate gestational weight gain (GWG) is an important measure of maternal health during pregnancy; inadequate GWG is associated with negative maternal and newborn outcomes. To fill the gap in our understanding of GWG levels and the burdens of inadequate and excessive GWG in resource-limited settings, the authors of this paper computed GWG estimates across time using Demographic and Health Survey (DHS) data. A hierarchical model was developed to estimate the mean total GWG and associated uncertainty ranges (URs) for a full-term pregnancy

for each country in 2015. Year and country-level covariates were used as predictors and variable selection was guided by the model fit. The final model included year, geographic area, mean adult female body mass index, gross domestic product per capita and total fertility rate.

Gestational weight data was available for 67 of the total 137 low- and middle-income countries (LMICs) in the DHS programme. Latin America and Caribbean (11.80 kg (95% UR: 6.18, 17.41)) and Central Europe, Eastern Europe and Central Asia (11.19 kg (95% UR: 6.16, 16.21)) were the regions with the highest GWG estimates. Sub-Saharan Africa (6.64 kg (95% UR: 3.39, 9.88)) and North Africa and the Middle East (6.80 kg (95% UR: 3.17, 10.43)) were the regions with the lowest estimates. With the exception of Latin America and Caribbean, all regions were below the minimum GWG recommendation for normal-weight women with sub-Saharan Africa and North Africa and the Middle East estimated to meet less than 60% of the minimum recommendation. National estimates for each country show

low levels of GWG in Africa, especially in sub-Saharan Africa. The five countries with the lowest GWG estimates were Congo, Afghanistan, Rwanda, Central African Republic and the Democratic Republic of the Congo. Sixteen LMICs met the minimum GWG recommendation for normal-weight women and only one country (Brazil: 14.0kg (95% UR: 2.8, 25.1)) met the minimum recommendation for underweight women.

Results reveal a large burden of inadequate GWG in most LMIC countries and regions. Gestational weight gain is strongly dependent on modifiable maternal factors including nutritional status, dietary intake, physical activity and pre-existing health conditions. Interventions promoting adequate GWG have the potential to improve maternal, foetal and child outcomes across the world.

¹ Wang, D, Wang M, Darling, A M, Perumal, N, Liu, E, Danaei, G and Fawzi W W (2020) Gestational weight gain in low-income and middle-income countries: a modelling analysis using nationally representative data. *BMJ global health*, 5(11), e003423. <https://doi.org/10.1136/bmjgh-2020-003423>

Rates and risk factors for preterm birth and low birthweight Research snapshot¹

Preterm birth² continues to be a major public health problem contributing to 75% of neonatal mortality worldwide. Low birth weight (LBW) is an important but imperfect surrogate for prematurity when the accurate assessment of gestational age is not possible. While there is an overlap between preterm birth and LBW newborns, those that are both premature and LBW are at the highest risk of adverse neonatal outcomes. Understanding the epidemiology of preterm birth and LBW is important for the prevention and improved care of at risk newborns.

The authors³ conducted data analyses using the Global Network's population-based registry of pregnant women and their babies in rural communities in six low- and middle-income countries (Democratic Republic of the Congo, Kenya, Zambia, Guatemala, India (two sites) and

Pakistan). Trained study staff enrolled all pregnant women in the study catchment area as early as possible during pregnancy and conducted follow-up visits shortly after delivery and at 42 days after delivery. The authors analysed the rates of preterm births, LBW and a combination of preterm birth and LBW from January 2014 to December 2018 and LBW and the risk factors associated with these outcomes.

A total of 272,192 live births were included in the analysis. The overall preterm birth rate was 12.6% (ranging from 8.6% in India/Belagavi site to 21.8% in Pakistan), the overall LBW rate was 13.6% (ranging from 2.7% in Kenya to 21.4% in Pakistan) and the overall rate of both preterm birth and LBW was 5.5% (ranging from 1.2% in Kenya to 11.0% in Pakistan). Risk factors associated with preterm birth, LBW and the combination

were similar across sites and included nulliparity [RR – 1.27 (95% CI 1.21–1.33)], maternal age under 20 years [RR 1.41 (95% CI 1.32–1.49)], severe antenatal haemorrhage [RR 5.18 95% CI 4.44–6.04], hypertensive disorders [RR 2.74 (95% CI – 1.21–1.33)] and one to three antenatal visits versus four or more [RR 1.68 (95% CI 1.55–1.83)].

The results show that younger, nulliparous women with limited access to antenatal care services are at higher risk of preterm births and need more attention to prevent prematurity and LBW.

¹ Pusdekar, Y V, Patel, A B, Kurhe, K G, Bhargava, S R, Thorsten, V, Garces, A and al (2020) Rates and risk factors for preterm birth and low birthweight in the global network sites in six low- and low middle-income countries. *Reproductive health*, 17(Suppl 3), 187. <https://doi.org/10.1186/s12978-020-01029-z>

² Birth before 37 weeks of pregnancy

³ Birth weight below 2500g

Relapse and post-discharge body composition of children treated for acute malnutrition using a simplified, combined protocol Research snapshot¹

Severe and moderate acute malnutrition (SAM and MAM) affect more than 50 million children worldwide. Despite gains in the treatment of SAM in the past decade, there is no current consensus on how best to manage children with MAM. Furthermore, treatment coverage for SAM and MAM remains low, with 80% of children not accessing care. One option to overcome these challenges is to combine the treatment of SAM and MAM into one simplified protocol.

The ComPAS trial (Combined Protocol for Acute Malnutrition Study) was a single-blinded, cluster randomised, controlled, non-inferiority trial to compare the recovery rates of a combined

protocol for uncomplicated SAM and MAM in children 6-59 months of age against standard treatment.² The combined protocol used a simplified dosage and provided two sachets of ready to use therapeutic food (RUTF) per day for SAM³ children and one sachet per day for MAM⁴ children. Results demonstrate non-inferior recovery of the combined protocol compared to standard care. To further inform policy, this study assessed the four months post-discharge outcomes of SAM and MAM children treated in Kenya.

The study recruited 850 children from 12 clinics (six using combined and six using standard protocol). The study found children treated with the combined protocol had similar an-

thropometry, fat-free mass, fat mass, skinfold thickness z-scores and frequency of common illnesses four months post-discharge compared to the standard protocol. Mean subscapular skinfold z-scores were close to the global norm and there was also no significant difference in the odds of relapse between protocols.

These results add further evidence that a combined protocol is as effective as standard care. This is an important finding as a simplified, combined approach could stretch existing resources further and treat more children.

¹ Lelijveld N, Musyoki E, Adongo W S, Mayberry A, Jonathan CW, Opondo C, Kerac M, Bailey J (2021) Relapse and post-discharge body composition of children treated for acute malnutrition using a simplified, combined protocol: A nested cohort from the ComPAS RCT. *PLOS ONE*. 2021;16(2): e0245477. <https://doi.org/10.1371/journal.pone.0245477>

² Weight-based dose of RUTF for children with SAM and RUSF for children with MAM.

³ Defined as MUAC < 11.5cm and/or mild or moderate oedema.

⁴ Defined as MUAC between 11.5 and <12.5cm and no oedema.

The importance of food systems and the environment for nutrition

Research snapshot¹

There is considerable ongoing debate around how food systems can better ensure the delivery of healthy, safe, nutritious foods in a way that is environmentally sustainable and resilient to climate change. Food systems are complex entities with many interconnecting drivers, stakeholders and outcomes. Furthermore, food systems and climate change have a cyclical relationship, as environmental change is both a driver and an outcome of food systems.

Climate change impacts the immediate, underlying and basic causes of undernutrition. As climate change progresses, optimal conditions for human health will continue to come under threat introducing instability into our food systems and ultimately decreasing access to nutritionally dense and healthy foods. While this is likely to affect the nutritional status of all populations, it will have a disproportionate impact on poor and marginalised populations.

The bi-directional relationship between food systems, environmental change and nutrition demands that nutrition scientists engage in food systems transformation. Nutrition is inherently a multidisciplinary science; however, within nutrition, scientists have been traditionally siloed into those studying undernutrition and overweight and those

in humanitarian or development contexts. Given the global inter- and transdisciplinary nature of these challenges, the traditional boundaries need to be broken down to ensure relevant public health interventions, research and policies.

Current research gaps in this important area include:

- Scientific consensus on definitions and metrics to assess the sustainability of dietary patterns and food environments
- Limited scope of research e.g., research needs to be implemented across different stages of the supply chain, a wider variety of food products and on a wider range of nutrition outcomes
- Limited topic base e.g., research is needed on food safety, food waste and loss and the role of consumer practices
- Levers of change in the food system and how to utilise these
- Accurate global and subnational data on topics such as dietary patterns, food loss and waste
- Applicability of current literature to more localised contexts

¹ Fanzo J, Bellows L A, Spiker L M, Thorne-Lyman L A, Bloem WM (2021) The importance of food systems and the environment for nutrition. *Am J Clin Nutr*. 2021; 113(1): 7-6. doi:10.1093/ajcn/nqaa313.

Monitoring systems for the management of severe acute malnutrition programmes in northern Nigeria

Research snapshot¹

Each year in Nigeria, more than two and a half million children under five years of age are affected by wasting. Since 2016, UNICEF has supported the government in the introduction of a Short Message Service (SMS) for data transmission to support the monitoring of community-based management of acute malnutrition (CMAM) programmes. The SMS system operates in parallel with the traditional paper-based system and transmits data directly from health facilities to federal levels on a weekly basis. In comparison, the paper-based system uses monthly data summaries that are passed through all levels of government. This study undertook contextualised research² to assess data quality and performance in both CMAM information systems.

The study adopted a mixed-method approach. Primary data, observations, interviews and the recount of data from outpatient therapeutic programme (OTP) cards were collected in nine health facilities in one northern state in Nigeria, while secondary data was obtained from five states. The accuracy and reliability of CMAM data were deficient to a similar extent in both the paper-based and SMS systems and discrep-

ancies existed between recounted and paper records for admissions, total exits, defaults, deaths and ready to use therapeutic food consumption for the audited month. The large discrepancies in some facilities indicate the loss or removal of OTP cards and the discrepancies in death or default rates can be attributed to inconsistencies between actual treatment practices and national CMAM guidelines, possibly leading to underestimations that give a false impression of good programme performance.

There are several advantages to the SMS reporting system such as fewer intermediate data transfers. However, mobile network coverage is not sufficiently reliable for the SMS system to replace the paper-based system in Nigeria. The study highlights the need for improvements in the design of the CMAM monitoring system, training in and supervision of data management and the communication of results.

¹ Tuffrey V, Mezger C, Nanama S, Bulti A, Oilsenekwu G, Umar C, Jones E, Namukasa E. Assessment of monitoring systems in the management of severe acute malnutrition in northern Nigeria. *BMC Nutr*. 2021; 7(2). <https://doi.org/10.1186/s40795-020-00405-z>.

² Contextualised research based on the PRISMA (Performance of Routine Information System Management) framework

Triple trouble: The triple burden of child undernutrition, micronutrient deficiencies and overweight in East Asia and the Pacific

Research snapshot¹

Young children in East Asia and the Pacific region are failing to thrive in large numbers as indicated by stagnation in the reduction of child undernutrition and micronutrient deficiencies and a growing prevalence of overweight and obesity. To address the lack of data on the drivers of child malnutrition in the region, the UNICEF regional office for East Asia and the Pacific commissioned a series of papers in 2017 to 2019. These papers found that most of the 26 countries in the region have a double burden of stunting, overweight or anaemia and six countries suffer from all three (the 'triple burden'). Poverty and inequality are the leading drivers of child malnutrition, with children often exposed to multi-dimensional forms of poverty, and poor maternal nutrition is a consistent predictor of stunting and wasting in the region.

However, national policies and programmes do not always address these key drivers and there is often still a focus on undernutrition alone rather than on the triple burden of malnutrition. Implications for future advocacy, policy and programme actions highlighted in the papers are as follows:

- Governments must address all forms of malnutrition in an integrated manner across the life cycle.
- Improving women's nutrition is central to breaking the intergenerational triple burden of malnutrition.
- Policies and programmes require an integrated multi-sector approach across food, health, water and sanitation, education and social protection systems to address the multiple determinants of child malnutrition.
- Nutrition-sensitive social protection programmes are needed to address the disparities and inequalities in child growth during the first 1,000 days.
- Prioritisation is needed in all countries to collect, analyse and utilise data to assess progress and to inform decisions.

To address the drivers of the triple burden of maternal and child malnutrition, synergistic and accelerated change is needed through broader and bolder multi-sector approaches.

¹ Blankenship L J, Rudert C, Aguayo M V. Triple trouble: Understanding the burden of child undernutrition, micronutrient deficiencies, and overweight in East Asia and the Pacific. *Maternal and Child Nutrition*. 2020; 16(S2). <https://doi.org/10.1111/mcn.12950>.

COVID-19 pandemic and mitigation strategies: implications for maternal and child health and nutrition

Research snapshot¹

The adverse global impact of COVID-19 on poverty, the coverage of essential support services and access to nutritious foods is likely to lead to an increase not only in the incidence of child wasting but also maternal and child undernutrition more broadly. A number of sectors that are critical for the reduction of maternal and child undernutrition are at risk of collapse or reduced efficiency. Specifically, disruption to food systems, incomes and services that provide healthcare, education, social protection and sanitation need to be mitigated during and in the aftermath of COVID-19 to reduce the burden of undernutrition.

The authors build on their previous 'Global Health's Stunting Reduction Exemplars' project to suggest priority actions within low- and middle-income countries. For food systems, these

include interventions to strengthen the food supply chain through investment and policy reforms and to reduce food insecurity by assisting those at immediate risk of food shortages. For incomes, interventions include targeted social safety net programmes, payment deferrals or tax breaks as well as suitable cash support programmes for the most vulnerable such as the national conditional cash transfer programme in Peru.

Community health workers (CHWs) and community groups, targeting the most marginalised households, can be utilised to address shortfalls in current healthcare, education, social protection and sanitation services. Ethiopia's health extension workers and Nepal's female community health volunteers showcase successful models of mobilising CHWs. CHWs and other community groups can also be an important

source of health and nutrition information while the education system is not fully functioning. Additionally, several community-level COVID-19 response measures such as contact tracing and self-isolation could also be exploited for nutrition protection. While government-led improvements in sanitation infrastructures might be on hold as a result of the pandemic, community-led sanitation programmes can ensure healthy household environments and reduce undernutrition, for example, the Community Led Total Sanitation programmes in Nepal, Ethiopia and Senegal.

Successful interventions to alleviate the effects of COVID-19 on maternal and child undernutrition will require governments, donors and development partners to re-strategise and reprioritise investments for the COVID-19 era and will necessitate data-driven decision making, political will and international unity.

¹ Akseer, N, Kandru, G, Keats, E C and Bhutta, Z A (2020) COVID-19 pandemic and mitigation strategies: implications for maternal and child health and nutrition. *The American journal of clinical nutrition*, 112(2), pp.251-256.

Assessing nutrient gaps and affordability of complementary foods

Research snapshot¹

Identifying nutrition and dietary gaps alongside foods that are best matched to fill these gaps is essential to inform nutrition-related policies and programmes. The five research papers in this Nutrition Reviews supplement address these questions for young children in Eastern and South Africa and South Asia. The first article by Beal et al (2021a) introduces a novel methodology for identifying the public health significance of nutrient gaps in children's diets. The methodology, called Comprehensive Nutrition Gap Analysis (CONGA), collates all relevant data points from a given region and provides clear criteria for rating the nutrient gap (as negligible, low,

moderate or high) implied by each data point. The methodology then assigns weights to each data point based on evidence type, geographic representation, recency of data collection, age and sex representation and sample size. For each nutrient, an overall nutrient gap rating is derived as well as an evidence quality rating.

The next two articles (White et al, (2021); Beal et al, (2021b)) detail the application of CONGA for children 6-23 months of age. The studies found clear differences in the availability of relevant data by country and micronutrient. Furthermore, important nutrient gaps were identified in iron, vitamin A, zinc, calcium, vitamin C (South Asia

only), vitamin B12 and folate. The last two articles (Ryckman et al, (2021a); Ryckman et al, (2021b)) identified the most affordable foods that could close the nutrient gaps previously identified. They found several nutrients with few affordable sources, with zinc being universally unaffordable.

While it is too early to say for sure whether these deductions are indeed valid, these papers provide a strong basis for the design of interventions to improve the nutrition of infants and young children in the poorest regions of the world.

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¹ Morris, S S, Garg, A, Black, E R Assessing the nutrient gap and the affordability of complementary foods in Eastern and Southern Africa and South Asia. *Nutrient Reviews*. 2021; 79 (S1): 1-3. <https://doi.org/10.1093/nutrit/nuaa149>.



Children eat a food supplement at a clinic in Democratic Republic of Congo

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Post-discharge interventions for children hospitalised with severe acute malnutrition

Research snapshot¹

It is well-evidenced that children hospitalised with severe acute malnutrition (SAM) have poor long-term outcomes following discharge including high rates of mortality, relapse to acute malnutrition, risk of infection and impaired cognitive development. While this evidence has resulted in calls for better support for children following discharge from inpatient treatment, there is currently minimal guidance and evidence on how to achieve this.

This systematic review and meta-analysis examined the types and effectiveness of post-discharge interventions for improving outcomes in children 6-59 months of age recovered from complicated SAM. Peer-reviewed and grey literature was searched in December 2019; 15 articles were found, representing 10 studies in seven countries.

Interventions identified in the papers included the provision of zinc, probiotics, antibiotics, pancreatic enzymes and psychosocial stimulation.

There was no evidence that zinc reduced mortality post-discharge in the single study reporting deaths. The two studies that gave probiotics did not find significant differences in post-discharge mortality, however the meta-analysis of the combined data suggested that prebiotics did reduce mortality (relative risk (RR): 0.72; 95% CI: 0.51, 1.00; $P = 0.049$). Antibiotics reduced post-discharge infectious morbidity but did not reduce mortality. Pancreatic enzyme supplementation reduced inpatient mortality (37.8% compared with 18.6%, $P < 0.05$) but there was no evidence of benefit on post-discharge outcomes. All studies providing psychosocial stimulation found improved neu-

rodevelopmental scores in one domain and meta-analysis showed an associated reduction in post-discharge mortality (RR: 0.36; 95% CI: 0.15, 0.87).

Other interventions of potential relevance that were not incorporated here as they were applied to outpatient SAM recoverees include cash transfers, water treatment packages and consideration of optimal timing of antiretroviral therapy initiation in HIV-infected children.

The authors summarise that there is currently limited evidence to inform post-discharge interventions in children recovered from complicated SAM despite the urgent need for evidence. Only 10 trials from the past five decades met the inclusion criteria. Several biomedical and psychosocial approaches show promise but further exploration is required.

¹ Noble, C C, Sturgeon, J P, Bwakura-Dangarembizi, M, Kelly, P, Amadi, B and Prendergast, A J (2021) Postdischarge interventions for children hospitalized with severe acute malnutrition: a systematic review and meta-analysis. *The American journal of clinical nutrition*, 113(3), pp.574-585.

Conceptual framework of food systems for children and adolescents

Research snapshot¹

Malnutrition in all its forms – undernutrition, micronutrient deficiencies and overweight/obesity – affects all age groups across the world and children and adolescents are especially vulnerable. In low- and middle-income countries, only one quarter of young children receive a diverse diet necessary for growth and development. Access to healthy and nutritious food is important throughout the life course and there is growing recognition that the current 'food system' needs radical transformation to ensure nutritious, safe, affordable and sustainable diets for all. However, much of the discussion on transforming food systems has not included children and adolescents

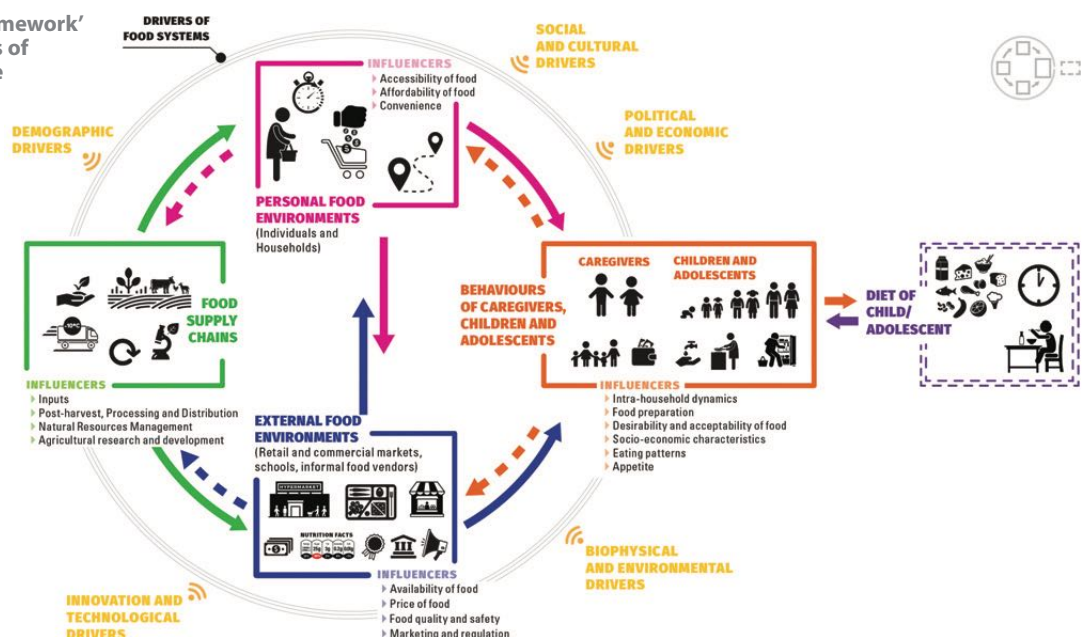
as key stakeholders. Given the unique nutritional needs of this group and their susceptibility to malnutrition, food system transformations need to explicitly incorporate this angle.

This paper proposes a new conceptual framework (the 'Innocenti Framework') to better articulate how the diets of children and adolescents are shaped by food systems. The food system determinants within the framework include food supply chains, external food environments, personal food environments and the behaviours of caregivers, children and adolescents. Examples of diet determinants specific to children and adolescents include the influence of schools, on

both access to information and as potential buyers of healthy food products, and intra-household dynamics. The framework also conceptualises the dynamic linkages between the determinants, influencers and drivers of food systems. The structure of the framework is based on that of the more general food systems conceptual framework developed by the 'high level panel of experts on food security and nutrition' committee. The framework highlights the diversity of actors that influence the diets of children and adolescents and calls for greater emphasis on the governance and accountability mechanisms of these actors in order to ensure access to nutritious, safe and affordable food.

¹ Raza, A, Fox, E L, Morris, S S, Kupka, R, Timmer, A, Dalmiya, N and Fanzo, J (2020) Conceptual framework of food systems for children and adolescents. *Global Food Security*, 27, p.100436.

The proposed 'Innocenti Framework' which outlines how the diets of adolescents and children are shaped by food systems



Fortified blended flour supplements displace plain cereals in feeding of young children

Research snapshot¹

Growth faltering often occurs during the period of complementary feeding, from six to 20 months of age, when the child is transitioning from exclusive breastfeeding to a family diet. In the Sahel, most complementary foods are composed of cereals that are often combined with sugar and water to make a porridge. This may provide sufficient dietary energy but lacks the protein, fats and micronutrients needed for optimum child growth and development. Lipid-based nutritional supplements (LNS) and fortified blended flours (FBF) are widely used to increase the nutrient density of children's diets in supplementary feeding programmes but their effectiveness can be modified by the displacement of other foods: if supplements replace plain household cereals but not more nutrient-dense family foods, the nutrient-density of the diet would improve; if, however, supplements displace nutrient-dense foods, the diet quality could worsen.

To explore this issue, the authors reanalysed data from a trial comparing the cost-effectiveness of three FBFs and one LNS in the prevention of stunting and wasting among infants aged seven to 23 months in Burkina Faso. Using logistic regression, the differential effects of these supplementary foods on the displacement of breastfeeding or household complementary foods were explored and which specific food groups were displaced was investigated.

Supplementation with FBFs displaced household cereal consumption significantly when compared to supplementation with LNS. The relationship was strongest for two of the three FBFs tested (CSB+ w/oil and CSWB w/oil). While there was some evidence that the third FBF tested (SC+) may also displace more vitamin A-rich fruits and vegetables than the LNS product tested, children who consumed SC+ were also more likely to eat other fruits and vegetables

indicating that those who consumed SC+ consumed similar amounts of fruits and vegetables as those in the other study arms, although of different types. Consumption of other foods, dietary diversity and breastfeeding did not differ significantly.

Evidence from this study that FBFs displace household cereals but not other more nutrient-dense foods may assuage concerns that supplementary foods have limited effectiveness due to the displacement of household foods. Given the small stomach size and limited feeding time of infants, this displacement of unfortified household cereals by fortified flours may be beneficial for infants in the meeting of their nutrient needs.

¹ Cliffer, I R, Masters, W A, Rogers, B L (2020) Fortified blended flour supplements displace plain cereals in feeding of young children. *Matern Child Nutr.* e13089. <https://doi.org/10.1111/mcn.13089>

Effectiveness of breastfeeding support packages in low- and middle-income countries for infants under six months

Research snapshot¹

Small and nutritionally at-risk infants under six months of age, defined as those with wasting, underweight or other forms of growth failure, are at high risk of mortality and morbidity. The World Health Organisation 2013 guidelines on severe acute malnutrition highlight the need to effectively manage this vulnerable group but programmatic challenges are widely reported. At the core of these guidelines is support for breastfeeding. Previous systematic reviews have examined interventions to promote breastfeeding but most

of these focused on the general infant population. This review aims to address the evidence gap on how to best support breastfeeding in a sub-population of small and nutritionally at-risk infants under six months of age in low- and middle-income countries (LMICs) by synthesising evidence on existing breastfeeding support packages for all infants under six months of age.

The authors searched PubMed, CINAHL, Cochrane Library, EMBASE and Global Health databases from inception to 18 July 2018. Inter-

ventions of interest were breastfeeding support packages. Studies reporting breastfeeding practices and/or caregivers'/healthcare staffs' knowledge/ skills/practices for infants under six months from LMICs were included. Of 15,256 studies initially identified, 41 were eligible for inclusion, representing 22 geographically diverse LMICs. Interventions were mainly targeted at mother-infant pairs and only 7% (n = 3) studies included at-risk infants. Studies were rated to be of good or adequate quality. Twenty studies focused on hospital-based interventions, another 20 on community-based and one study compared both. Among all interventions, breastfeeding counselling (n = 6) and education (n = 6) support packages showed the most positive effect on breastfeeding practices followed by breastfeeding training (n = 4), promotion (n = 4) and peer support (n = 3). Breastfeeding education support (n = 3) also improved caregivers' knowledge/ skills/practices.

The identified breastfeeding support packages can serve as 'primary prevention' interventions for all infants under six months in LMICs. For at-risk infants, these packages need to be adapted and formally tested in future studies. Future work should also examine the impacts of breastfeeding support on anthropometry and morbidity outcomes.

¹ Rana, R, McGrath, M, Sharma, E, Gupta, P, Kerac, M (2021) Effectiveness of Breastfeeding Support Packages in Low- and Middle-Income Countries for Infants under Six Months: A Systematic Review. *Nutrients.* 2021; 13(2):681. <https://doi.org/10.3390/nu13020681>



A mother breastfeeds her malnourished 14-day-old son at a health centre in Somalia

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Impact of maternal mental health on recovery from severe acute malnutrition in Malawi

MSc summer project¹

By Mphatso Nancy Chisala



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MALAWI

What we know: Women face the biggest burden of mental illness globally. Maternal mental illness affects childcare practices which is one of the underlying causes of childhood malnutrition.

What this article adds: This article is a follow up study of children in Malawi treated for severe acute malnutrition seven years prior. It adds to the limited literature base on the relationship between maternal mental health and child health and growth outcomes in low and middle-income countries. The study shows the complex relationship between maternal mental health and child health, as the study finds no association between mothers at high risk of common mental disorders and children's nutritional status. There are several possible contributing factors to this finding including the study methodology, loss to follow-up, the age of the children, shared parenting and the socio-economic context. The study did find that mothers reporting intimate partner violence and low social support are at a high risk of reporting symptoms of depression and anxiety. The complexity of the interaction between maternal mental health and child nutritional status highlights the need for holistic approaches when addressing these issues.

Background

Malnutrition is one of the leading causes of mortality and morbidity amongst children under the age of five years (under-5) in Malawi (Ministry of Health et al, 2015). Over a third of children under-5 (36%) are stunted and 12% are underweight (NSO Malawi and ICF, 2015). Additionally, 33% of deaths in children under-5 are associated with malnutrition (UNICEF, 2011). It is estimated that approximately 10% of Malawi's Gross Domestic Product (GDP) is lost due to childhood malnutrition (~MKW 147 billion/USD597 million per year) of which 60% is from reduced potential productivity due to nutrition related mortality and morbidity (Ministry of Health et al, 2015).

Mental disorders are the fifth leading cause of global disability-adjusted life years (DALYs) and account for 32% of years lived with disability (Rehm & Shield, 2019). Over the past three decades, mental health disorders have increased significantly (by 36.7%) with the highest burden of these mental disorders being among women

of reproductive age (Rehm & Shield, 2019). Maternal mental illness has severe negative long-term effects on both mothers and infants. Mothers with a mental illness are more likely to have poor mother-child interaction and poor parenting practices resulting in poor childcare and feeding practices and unstimulating environments, indirectly resulting in poor child growth. However, the effects of maternal illnesses, especially depressive symptoms, on child growth have been given less attention in developing countries, especially in sub-Saharan Africa (SSA). The prevalence of a common mental disorder (CMD) amongst Malawian women is up to 30%, two times higher than the weighted prevalence of maternal mental disorders in the SSA region (Stewart et al, 2014). Depressive and anxiety disorders are the fourth leading cause of morbidity in Malawi with the majority affecting women (Stewart et al, 2014). Maternal mental illness and childhood undernutrition share similar risk factors including poverty, increased disease burden, illiteracy, unemployment and food insecurity.

As previously mentioned, there has been little research to assess the relationship between maternal mental health and child outcomes in low and middle-income countries despite evidence that mental health problems are four times higher and more persistent in developing countries compared to developed countries (Bennett et al, 2017). Even so, studies that have assessed this relationship are usually of short postpartum periods and do not further explore the effects of maternal mental health in later childhood. Additionally, no studies have further explored the relationship between mothers at risk of a CMD and the recovery of children with severe acute malnutrition (SAM). Maternal mental health has been identified as one of the nutrition-sensitive interventions that has the potential to optimise child growth and development. Despite the increasing attention to interventions on the immediate causes of malnutrition, there are still gaps in addressing maternal mental illness as a risk factor for child malnutrition in settings like Malawi.

The Chronic Diseases Outcome after Severe Acute Malnutrition (ChroSAM) explores the hypothesis that maternal illness affects child growth beyond the early years of life. It also explores the potential impact of maternal depression/anxiety on the recovery of children who had been treated for malnutrition after discharge. This presents an opportunity for untapped potential for interventions that aim at improving child outcomes in women at risk of CMDs. This is important as it contributes to the existing literature since there is now increasing interest in addressing maternal mental health as a platform for improving child growth and health outcomes.

The ChroSAM study is a prospective cohort study that followed 320 children admitted for the treatment of SAM seven years prior in Malawi. The aim of the ChroSAM study was to assess the long-term effects of malnutrition on

¹ Summary of full MSc summer project paper which is available on request from the author.

children previously exposed to SAM. A secondary analysis was conducted of the ChroSAM findings to explore the potential association between mothers at risk of a CMD and the recovery of children with SAM in this setting.

Methodology

The ChroSAM study followed 320 children who were admitted for treatment for SAM while under five years of age at Queen Elizabeth Hospital, Malawi, seven years prior to the analysis. The study also included 219 siblings of these cases and 184 children within the community as comparison groups. The community controls were randomly selected by spinning a bottle close to the cases' house and matched by sex and age (± 12 months). Multiple data on risk factors associated with malnutrition was collected at this follow-up including information about maternal mental health status. Amongst this cohort, 450 main carers/mothers were assessed for a CMD using the World Health Organization (WHO) self-reported questionnaire (SRQ-20).

The SRQ-20 is a screening tool developed by WHO to assess the risk of a CMD, including depression and anxiety/stress, in communities in developing countries. The SRQ-20 has 20 yes/no questions related to the recent wellbeing of the respondent in the past four weeks. A Chichewa version of SRQ-20 has been translated and validated for use in Malawi (Stewart et al, 2009). The questionnaire suggested cut-off points of $\leq 8/20$ as low risk for a CMD and $>9/20$ scores as increased risk of a CMD requiring further referral or assessments. Children's nutritional status was assessed according to weight-for-age z-score (WAZ), height-for-age z-score (HAZ) and body mass index-for-age z-score (BAZ) using WHO growth standards. In addition to basic child characteristics (including age, sex, birth order and HIV status), information was also collected on the mothers' general wellbeing including HIV status, education levels and the mothers' ability to read or write.

Findings

A total of 295 out of 450 women who were administered the SRQ-20 questionnaire were mothers of children previously exposed to SAM (cases) and 155 were mothers of community control children. A total of 83 out of 450 of mothers (18%) were at risk of having a CMD, of which 56 (67%) were mothers of cases. About one in four mothers (26%) reported having experienced intimate partner violence in the past. Additionally, two-thirds of mothers (63%) reported having available social support and only 4% of mothers reported having low social support. There was a high prevalence of HIV status among mothers (30%), of which the majority were mothers to cases compared to mothers of community controls (37% vs 16%, p -value <0.001). More mothers of community controls had experienced intimate partner violence compared to mothers to cases (34% vs 21%, p -value 0.019).

The mean age for the children in the study was 11.2 years (± 7.8) and 410 of children

(53%) were female. The overall HIV prevalence amongst the children was 14% although 28% of the participants had an unknown HIV status. Cases had the highest HIV prevalence of 27% compared to the sibling and community control (4% and 3% respectively, p -value <0.001).

Overall, there was a high prevalence of underweight and stunting amongst the study population (46% and 36% respectively). Additionally, cases had a significantly lower WAZ, HAZ and BAZ score compared to the sibling control and these were also much lower than for community controls.

There was no association between SRQ-20 and nutritional status even after adjusting for parity, maternal age, maternal employment, intimate partner violence and child's sex and HIV status. However, mothers who had a high SRQ score had a two-fold increase in the odds of reporting intimate partner violence (OR 2.5 95% CI 1.5-4.4, p -value <0.001) and a four-fold increase in the odds of having low social support (OR 4.7 95% CI 1.6-13.9 p -value <0.001). This strong association was seen amongst mothers to cases for both intimate partner violence and social support but was lost amongst the community controls. There was also some association between having a high SRQ-20 score and being HIV positive or having a female child.

Discussion

This study showed no association between mothers at a high risk of a CMD and children's nutritional status seven years after treatment for SAM. Results do, however, highlight that mothers reporting intimate partner violence and low social support are at a high risk of reporting symptoms of depression and anxiety.

In a cross-sectional study assessing mental disorders amongst women with young infants in rural Malawi, Stewart et al found that infants of mothers with a CMD had significantly lower nutritional indices compared to infants of mothers without a CMD (Stewart et al, 2014). Similarly, a meta-analysis undertaken to assess the effect of maternal mental health on child nutrition in developing countries found a moderate association with children of depressed mothers having 1.5 times the odds of stunting and underweight compared to children of mothers who were not depressed (Surkan et al, 2011). However, some studies in South Africa and Ethiopia, which are similar settings to Malawi, found no association with maternal mental health and child growth even after controlling for all factors associated with both (Nguyen et al, 2014).

Interestingly, studies in Asia have consistently found a strong and significant association between maternal mental health and child growth (Nguyen et al, 2018; Saeed et al, 2017; Surkan et al, 2011). In a multicentre study assessing the impact of maternal mental health in Ethiopia, Bangladesh and Vietnam, despite the high rates of stunting and undernutrition seen in Ethiopia, there was no association between stunting and maternal

mental health as was seen in Bangladesh and Vietnam (Nguyen et al, 2018). Similarly, a community based prospective study in Peru, India, Vietnam and Ethiopia found a strong and persistent association between mothers at risk of CMD and child growth at one, five and eight years in India and Vietnam unlike in Ethiopia or Peru (Bennett et al, 2017).

When interpreting the absence of association in the Ethiopian studies, the authors suggested that the shared parenting in such a setting probably dilutes the negative effects of a CMD on child growth compared to other settings like South Asia. Additionally, the timing when assessing the effects of maternal mental illness on child growth affects the association between a CMD and child nutrition status. Studies assessing the impact of maternal depression in children over 12 months are less likely to see an impact of a CMD on growth as, beyond this point in settings like Malawi, childcare is not entirely dependent on the mother but also her family members/communities (Stewart, 2007). Additionally, the socio-economic context plays a major role in the association between maternal mental health and infant growth. In areas with high food insecurity and poverty rates, any association between maternal mental health and any measurable impact may be masked/diluted by these factors that are associated with both undernutrition and depression. Overall, the different findings in the different settings are attributed to different study methods such as clinical vs population-based studies, different CMD measurement scales and times and different sample sizes.

It is also important to consider that only 47% of the cases were identified in the ChroSAM study with the major reason for loss to follow-up being death from nutrition-related illnesses. Considering that a major loss/traumatic event like the loss of a child is a strong risk factor for a CMD, mothers of surviving children are less likely to present with symptoms of a CMD compared to those that were lost to follow-up. This could potentially dilute the association between a CMD and the nutrition status of children.

The lack of association in this study emphasises that the pathways and interactions for the association between malnutrition and mental illness are complex and should therefore be addressed holistically. In settings like Malawi that have high rates of poverty and food insecurity, which are both important risk factors for undernutrition and maternal mental disorders, multi-sector interventions are needed that approach these issues holistically. Context-specific, targeted interventions aimed at addressing intimate partner violence have the potential to reduce the risk of a CMD and thus improve childcare practices among mothers. As social support plays a major role in childcare, mothers'/carers' support should be assessed in communities and primary health care settings. This would also require training primary health care and community health workers to identify mothers at risk of depression.

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Response to malnutrition treatment in low weight-for-age children: secondary analyses of ComPAS trial data

Research summary¹



KENYA AND SOUTH SUDAN

What we know: Children who are concurrently wasted and stunted (WaSt) have a very high mortality risk but current programmes tend to focus on addressing stunting or wasting, not both.

What this article adds: A secondary analysis of moderately and severely wasted children treated in the 'ComPAS' trial was undertaken to assess the response to treatment according to weight-for-age z-score (WAZ) and mid-upper arm circumference (MUAC) and the type of feeding protocol given. The analysis of 4,020 children confirms that WAZ<-3 identifies the majority of children as WaSt. Those with moderately low MUAC (11.5–12.5 cm) and a severely low WAZ (<-3), not currently eligible for therapeutic care, respond similarly to treatment when provided with a supplementary diet of either one sachet per day of ready-to-use therapeutic food (RUTF) or a standard dose of ready-to-use supplementary food. Their recovery rate (54%) was better than those with severe wasting (19.6%) who were provided with a therapeutic diet and slightly worse than others with moderate wasting (59.5%). Children with a severely low MUAC (<11.5 cm) had similar recovery rates whether they were provided with a standard dose of RUTF or a simplified, reduced dosage of two sachets per day. A model that supports moderately wasted children with WAZ<-3 with a supplementary dose of lipid nutrients and those with severe wasting with a reduced therapeutic dosage should therefore be explored in order to efficiently reach the majority of children at high risk of mortality.

Background

Children who are concurrently wasted and stunted (WaSt) are among the most vulnerable of all malnourished children with a higher mortality risk than either wasting or stunting alone and about a 12 times greater risk of mortality in the absence of treatment than those with normal anthropometry (Myatt et al, 2018). Current conventions in policy and practice mean that programmes tend to focus on addressing either stunting or wasting, not

both. Current therapeutic feeding programmes use mid-upper arm circumference (MUAC) < 11.5 cm, weight for height z-score (WHZ) <-3 and/or the presence of oedema as independent admission criteria. Some children who are severely wasted and concurrently stunted are included according to these criteria but moderately wasted children who are concurrently stunted will not be captured for therapeutic feeding despite having a similar near-term mortality risk to severely

wasted children. Exploration of practical anthropometric criteria for identifying children with WaSt has found that severely low weight-for-age z-score (WAZ) has the highest (>90%) sensitivity and specificity for identifying these children across multiple settings (Myatt et al, 2018) and that a combination of severely low MUAC (already well evidenced to identify those at high risk of mortality and easy to use) plus a severely low WAZ could best identify those malnourished children at most risk of dying including those with WaSt and those with a severely low WHZ (Myatt et al, 2019). However, given that WAZ<-3 is not currently one of the criteria for admission to therapeutic feeding programmes, the intensity of treatment required by this additional group of children and the impact of their inclusion on therapeutic programme caseloads is yet to be evaluated. To help fill this evidence gap, a secondary analysis of data from a recent trial in Kenya and South Sudan ('ComPAS trial') was conducted.

Methods

The ComPAS trial database includes children with MUAC<125 mm who were treated with either a simplified, combined protocol (two sachets of ready-to-use therapeutic food (RUTF) per day for severe wasting and one sachet (2092

¹ Bailey, J, Lelijveld, N, Khara, T, Dolan, C, Stobaugh, H, Sadler, K, Lino Lako, R, Briend, A, Opondo, C, Kerac, M and Myatt, M (2021) Response to Malnutrition Treatment in Low Weight-for-Age Children: Secondary Analyses of Children 6–59 Months in the ComPAS Cluster Randomized Controlled Trial. *Nutrients*, 13(4), p.1054.

kJ/500 kcal) of RUTF per day for moderate wasting) or those treated with standard care (weight-based dosage of RUTF for severe wasting and one sachet per day ready-to-use supplementary food (RUSF) for moderate wasting) (Bailey et al, 2020). These two treatment groups allowed for comparison of the response to different intensities of treatment for children with WAZ<-3.

Children in the dataset were categorised into the following four groups:

- Group 1: MUAC < 11.5 cm and WAZ ≥ -3, *i.e., severely wasted but not WaSt*
- Group 2: MUAC between 11.5 cm and <12.5 cm and WAZ < -3, *i.e., moderately wasted and WaSt*
- Group 3: MUAC < 11.5 cm and WAZ < -3, *i.e., severely wasted and WaSt*
- Group 4: MUAC between 11.5 cm and <12.5 cm and WAZ ≥ -3.0, *i.e., moderately wasted but not WaSt*

Groups 1 and 3 are already included in current therapeutic feeding programmes based on MUAC definitions of severe wasting. However Groups 2 and 4 would not usually qualify for therapeutic care under current guidelines although they may be eligible to receive supplementary feeding if available in their context.

Key Findings

The analysis, which included 4,020 children,

confirmed previous findings that WAZ<-3 identifies the majority of WaSt children. In this dataset, 1,150 (89.5%) of children with a WHZ <-2.0 and HAZ <-2.0 (true definition of WaSt) also had a WAZ <-3.0. The analysis also found that children in Group 2 (those with moderately low MUAC (11.5-12.5 cm) and a severely low WAZ (<-3)) respond similarly to treatment in terms of both weight and MUAC gain when provided with a supplementary diet of either 2092 kJ (500 kcal)/day of RUTF or a standard dose of RUSF. Their recovery rate (54%) was better than those with severe wasting (19.6%) who received a therapeutic diet and slightly worse than others with moderate wasting (59.5%).

This analysis also confirms the particularly high vulnerability of Group 3 children (MUAC <115 and WAZ <-3) who had the lowest recovery rate (16.7%) despite being five months older on average than children in Group 1. Children in Group 3 also had the highest proportion of defaulters (39.4%) and deaths (1.9%) despite receiving therapeutic food. Children with a severely low MUAC (<11.5 cm) (Groups 1 and 3), with/without a severely low WAZ (<-3), received a reduced dosage of RUTF on average if they were in the combined protocol arm compared to the standard protocol arm. However, despite this, both trial arms had similar recovery rates, although WAZ gain was potentially slower in the combined protocol arm.

Conclusion

In summary, this data argues that children with a MUAC<125 mm and a WAZ<-3 given a supplementary dose of either RUTF or RUSF achieve a recovery rate comparable to the rate achieved by other children with MUAC<125 mm treated with the ComPAS protocol. Following further research, it may therefore be optimal for wasting programmes seeking to support the highest risk children to provide a therapeutic product to children with MUAC<115 mm and a supplementary product to children with WAZ<-3 not captured by a severely low MUAC. The poor recovery rates found in the group of children with both severely low MUAC and WAZ suggests that more research is needed into the adequacy of current therapeutic protocols for this highly vulnerable group.

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Commentary on the implications of this analysis from the perspective of the ENN wasting and stunting (WaSt) project

By Tanya Khara, ENN Technical Director and WaSt Technical Interest Group¹ Coordinator

Publications from the Wasting and Stunting Technical Interest Group (Myatt et al, 2018 and Myatt et al, 2019) have highlighted the potential of weight-for-age z-score (WAZ) <-3 in identifying children with WaSt at high risk of dying and have suggested that this admission criteria be considered for treatment services. What this additional target group would need in terms of intensity of treatment to bring them out of their high-risk state (*i.e.*, treat the wasting component of their condition) is highlighted by the group as an area requiring further study.

The findings of the above analysis that members of the WaSt TIG collaborated on are promising. They suggest that the group of children with WAZ<-3 who also have a mid-upper arm circumference (MUAC) of between 115 mm and 125 mm (*i.e.*, who would not be included in therapeutic feeding where MUAC was the only admission criteria) did respond well to a supplementary dose (500kcal/d) of a lipid nutrient supplement delivered as part of the ComPAS protocol. This response, in terms of weight and MUAC gain, was comparable to the rate achieved by other children with MUAC<125 mm treated with a ComPAS protocol and was similar irrespective of whether ready-to-

use supplementary food (RUSF) or ready-to-use therapeutic food (RUTF) was given.

The above analysis does not include the group of children who have WAZ<-3 and MUAC greater than 125 mm simply because this group was not included in the original trial and therefore results cannot be extrapolated to all children with WAZ<-3. The analysis also does not allow for exploration of what happens to this group of interest if they receive other non-lipid supplementary foods, such as corn-soy blended flour, no nutrition counselling or no care, an area that may be the subject of further study. It is also important to note that this dataset was not powered for these sub-group analyses specifically so a further analysis with a larger dataset is warranted. An initiative to do this, pooling a number of different datasets, is already underway as a collaboration between Action Against Hunger and the WaSt TIG.

The findings also support plans by the WaSt TIG to test a programme model that seeks to support children at highest risk by providing a standard therapeutic protocol to children with MUAC<115 mm and trialling a less intense protocol to children with WAZ<-3 not captured by the se-

verely low MUAC criteria but potentially identified via growth monitoring and promotion platforms.²

The increased caseload of children if WAZ<-3 were to be added to programme admission criteria and the subsequent effects on the health service remain important factors to consider. This analysis found that, in these settings, WAZ<-3 affected 29% of children in the cohort even though this was limited to children with a MUAC<125 mm. This is an important consideration for any potential future research into how treatment programmes may accommodate this group.

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¹ <https://www.ennonline.net/ourwork/reviews/wastingstunting>
² <https://www.ennonline.net/resource/newevidenceintopractice>

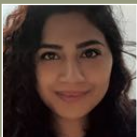
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Transforming food systems to improve diet affordability: Fill the Nutrient Gap analysis in Burkina Faso

Research summary¹

By Sumra Kureishy, Natalie West, Saidou Magagi and Katrien Ghoos



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The World Food Programme (WFP) Regional Bureau for West and Central Africa (RBD) would like to thank the Government of Burkina Faso for its leadership, collaboration and commitment to the Fill the Nutrient Gap Analysis. WFP RBD would also like to acknowledge the collaboration and support provided by the WFP HQ (Pierre Momcilovic, Zuzanna Turowska and Nora Hobbs) and WFP Burkina Faso (Kouhin-Néa Doré and Olga Ninon).

BURKINA FASO

What we know: A multi-sector approach is essential to ensure nutrition security for all.

What this article adds: A Fill the Nutrient Gap (FNG) analysis was conducted in Burkina Faso to identify barriers to adequate nutrition intake and to propose solutions to improve the availability of nutritious food, as well as its physical access and its affordability, particularly by the most vulnerable populations. The results showed that a nutritious diet is not affordable for half of the population. The cost of an energy sufficient diet is USD1.22 per day for a household of six. The cost of a nutritious diet is USD2.59 which represents a proportion of 50% to 110% of the minimum daily wage (USD2.20) in Burkina Faso. To improve access to nutritious food and prevent malnutrition in a sustainable manner, the FNG analysis identified and modelled the potential impact of activities in several sectors that target vulnerable households and individuals and are tailored to geographic and seasonal specificities. Improved homestead gardens could cover 20% of the cost of household food, milk and fish production could cover 40% while food baskets and combinations of interventions could cover more than 75% of the cost of household food during the lean season and for displaced persons.

Introduction

Burkina Faso has made progress in recent years in improving the health and nutrition of children under five years of age. The national trend in the prevalence of stunting and wasting has decreased over the past decade (World Bank, 2021). However, the country still faces challenges in reducing malnutrition, including micronutrient deficiencies.

With the recurrence of conflict, climate shocks and the COVID-19 pandemic, communities are experiencing a loss of livelihoods resulting in increased food insecurity and malnutrition (OCHA, 2020). Markets are poorly supplied with high quality nutritious food, the infrastructure to produce fortified food is inadequate and diets remain undiversified.

A multi-sector approach, using a range of policies, strategies and actions, is essential to ensure nutritional security for all. To this end, the Government of Burkina Faso conducted a Fill the Nutrient Gap (FNG) analysis in 2020. The Nutrition Directorate of the Ministry of Health conducted this

study under the direction of the Prime Minister with technical and financial support from the World Food Programme (WFP) and the International Fund for Agricultural Development (IFAD).

Methods

The FNG analysis is a multi-sector food system analysis approach to nutrition. The analytical framework combines a Cost of the Diet (CoD) analysis with a review of secondary data with the aim of identifying barriers to adequate nutrition intake and entry points for improving the availability of, and physical and financial access to, nutritious foods, particularly by the most vulnerable populations (Deptford et al, 2017). The effective engagement of stakeholders from multiple sectors plays a central role in the analytical process and ensures that the results of the analysis are followed

¹ Gouvernement du Burkina Faso, WFP, FIDA (2020) Fill the nutrient gap, Burkina Faso. Rapport Résumé. Juillet 2020. https://docs.wfp.org/api/documents/WFP0000122033/download/?_ga=2.31114303.182709335-8.1617034052-2028320644.1583855001

by nutrition-specific and nutrition-sensitive programmatic and policy decision-making (Bose et al, 2019).

Findings and key interventions

The analysis in Burkina Faso was carried out in close partnership with IFAD which allowed for a particular focus on food systems, including food production. The results showed that a nutritious diet is not currently financially accessible (affordable) for half of the population. The cost of an energy sufficient diet is USD1.22 per day for a household of six people and the cost of a nutritious diet is USD2.59 which represents 50% to 110% of the minimum daily wage (USD2.20) in Burkina Faso (IFC, 2019). Within the household, adolescent girls and pregnant and lactating women have greater nutritional needs and thus higher individual costs.

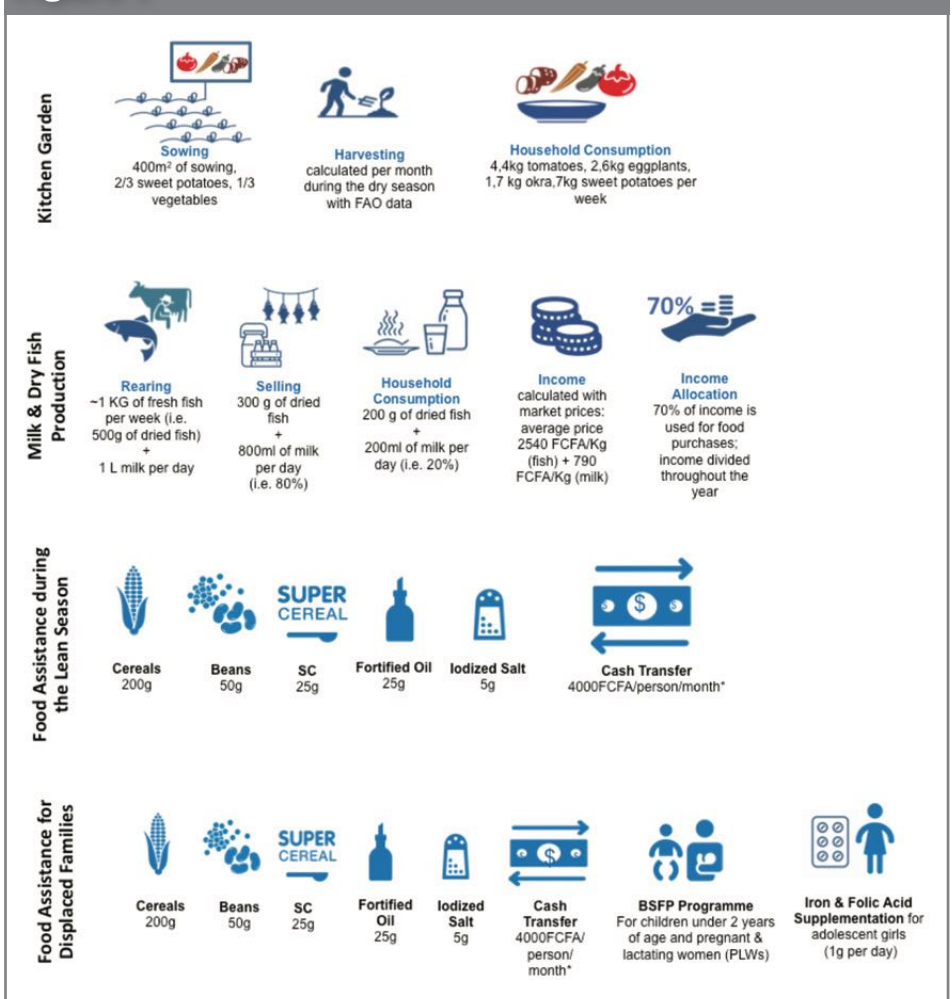
Structural bottlenecks in nutritious food value chains have been exacerbated by recent insecurity and conflict resulting in high prices, especially for nutrient-rich animal source foods. The impact is felt most acutely in the north of the country which is supplied by the agricultural breadbasket of the south. Food prices, the cost of a nutritious diet and lack of affordability are highest in the pastoral north and in areas hosting internally displaced persons (IDPs). Displaced populations also suffer higher rates of malnutrition than host populations and are more food insecure due to the loss of their agricultural livelihoods and the frequent sale of assets (including livestock). In agricultural areas, cereals are the dominant production. Investment in and diversification of production are essential to improve nutritional status not only in these areas but in the rest of the country that depends on these crops.

Improving access to nutritious food and preventing malnutrition in a sustainable manner requires a reorientation of interventions toward food systems and multi-sector collaboration. The FNG analysis identified and modelled the potential impact of activities in several sectors that target vulnerable households and individuals and are tailored to geographic and seasonal specificities. These interventions include agricultural and pastoral production enhancement, food assistance, cash transfers and nutritional supplementation (Figure 1). The activities modelled can contribute directly to nutritious food intake or through food purchases with the income generated, thereby reducing the remaining cost of a nutritious diet and reducing non-affordability. Improved vegetable gardens could cover 20% of the cost of household food and milk and fish production could cover 40% while food baskets and combinations of interventions could cover more than 75% of the cost of household food during the lean season and for displaced people.

Conclusion

This analysis created several opportunities including strengthening partnerships between government structures and technical partners

Figure 1 Key interventions to transform food systems and improve affordability



such as the Société nationale de gestion des stocks de sécurité alimentaire (SONAGESS), IFAD and FAO. A key lesson learnt from the FNG analysis in Burkina Faso is that it is important to strengthen knowledge about the role of supply chains and the multi-sector nature of interventions in order to improve availability and access to nutritious food.

Similar FNG analyses have been conducted in other Sahelian countries and have led governments, in collaboration with the WFP, to launch the CRIALCES project – Food Crisis Response in the Central Sahel: Nutritional Support and Recovery for Burkina Faso, Niger and Mali (2020-2024) (European Commission, 2021).

This project focuses on reorienting food systems toward the production, processing, distribution and consumption of nutritious, physically and financially accessible food, including for the most vulnerable, in crisis-affected areas. This includes improving resilience by strengthening small-scale farmers and food processing units, access to markets and finance. The project will also implement social and behaviour change communication activities aimed at increasing access to and affordability of locally available nutritious foods to improve feeding practices and prevent malnutrition.

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The No Wasted Lives Research Agenda - Revisited

This article is a summary of the Research Agenda Revisited published by the No Wasted Lives Secretariat and the Council of Research Technical Advice on Acute Malnutrition.



Background

April 2021 marked the end of the CMAM 2.0: Reinventing Community Management of Acute Malnutrition grant supported by the Children's Investment Fund Foundation that financed the No Wasted Lives initiative. Over the last five years, the initiative has been recognised for its influence in moving research forward and addressing knowledge gaps in the treatment of child wasting, with the Council of Research & Technical Advice on Acute Malnutrition (CORTASAM) playing a key role in the identification of knowledge gaps.

In January 2018, CORTASAM and the No Wasted Lives Coalition published a global Research Agenda for Wasting (CORTASAM, 2018). This was based on the results of a research prioritisation exercise (Angood, Kerac, Black et al, 2021) and outlined seven priority research areas with high potential for improving the effectiveness of, and access to, wasting treatment (Box 1).

In 2019, a Research Landscape Review was conducted to evaluate the progress made towards the Research Agenda outcomes (CORTASAM, 2020a). Based on these results, the members of CORTASAM identified outstanding gaps and published the Research Agenda Revisited in early 2021 (CORTASAM, 2021). The key findings are summarised below.

Progress in priority areas of research

Simplified approaches

Significant progress has been made in the first three research areas which are now generally grouped together under the term 'simplified approaches'. These encompass expanded admission and discharge criteria to include moderate wasting, the use of mid-upper arm circumference (MUAC) and oedema only for admission and discharge, reduced dosage of ready-to-use therapeutic food (RUTF), the treatment of moderate and severe wasting with one product and the involvement of community health workers in wasting management.

Box 1 Priority research areas according to the 2018 Research Agenda

1. Effective approaches to detect, diagnose and treat wasting in the community
2. Appropriate entry and discharge criteria for wasting treatment to ensure optimal outcomes
3. Reduced dosage of ready-to-use therapeutic food for the treatment of wasting
4. Effective treatment of diarrhoea in children with severe wasting
5. Rates and causal factors of post-treatment wasting relapse across contexts
6. Identification and management of small and nutritionally at-risk infants under six months of age and their mothers
7. Alternative formulations of ready-to-use foods for wasting

While research on the simplified approaches is encouraging, more evidence is needed. The consequences of using MUAC and oedema only for admission and discharge require further evaluation and additional approaches to identify at-risk children should be explored. More evidence is needed on the impact of reduced treatment dosage on height, body composition and non-anthropometric outcomes, as well as on the effects among different age groups and vulnerable populations. The Research Agenda Revisited identifies a need for research from contexts outside of sub-Saharan Africa, in particular from South Asia which has the highest global burden of wasting. Promising interventions and modifications to treatment protocols also require testing at scale and the integration of community-based approaches to wasting management need to be strengthened. Future research should recognise the continuums between moderate and severe wasting, as well as between the prevention and treatment of wasting, and should also explore effective interventions for wasting prevention.

Fluid management in severely wasted children

Recent reviews have highlighted the need to update global guidelines on fluid management in children with severe wasting. Further research is needed on which fluids to use and in what circumstances, as well as on adequate volumes and the routes of administering these.

Post-treatment relapse

The burden of, and risk factors for, post-treatment relapse across contexts is poorly understood. In order to generate evidence on relapse, a standardised definition is needed. In 2020, CORTASAM proposed interim guidance for the standard definitions of relapse, regression and reoccurrence of wasting and called for feedback from researchers and practitioners on these (CORTASAM, 2020b). A conceptual framework was also generated to support the development and testing of effective interventions to reduce post-treatment relapse (Schaefer et al, 2020). There is a large body of ongoing and planned research on relapse that should consider the latest guidance on definitions and measurement.

Management of nutritionally at-risk mothers and infants

There has been significant progress in managing at risk mothers and infants under six months of age through the piloting and implementation of the C-MAMI tool in several contexts and, more recently, remodelling of the tool as the MAMI care pathway. A body of evidence is also being built on criteria to identify at risk infants using weight-for-age (WAZ) and MUAC, as well as feeding, clinical and maternal indicators.

However, there is a need for coordinated, evidence-based global guidance to advance case iden-

tification and management, as well as to inform and drive the development of policy and programming. To achieve this, coordinated formal and operational research from diverse contexts including South Asia is required. Also key is active engagement in the World Health Organization (WHO) guideline development process, engagement across sectors including health, early childhood development, maternal mental health and neonatal health and the dissemination of evidence through global and regional networks. These actions are being pursued by the MAMI Global Network <https://www.enonline.net/ourwork/research/mami>

Alternative formulations

In recent years, several studies have investigated the effectiveness of alternative formulations of RUTF. These include aims to replace or reduce milk and/or peanut content and to change fatty acid profiles. A new guideline on the dairy protein content of RUTF is underway. Future studies should include an evaluation of the costs and the acceptability of alternative RUTF formulations, the growth, body composition and neurocognitive outcomes and whether one product can be used for managing both moderate and severe wasting. The role of emulsifiers in RUTF should also be investigated. In addition, the effectiveness of new formulations should be tested in home-based settings at operational scale. Lastly, economic, health system and environmental implications as well as the role of the private sector in the development and delivery of RUTF should be examined.

Conclusions

Significant progress has been made towards the CORTASAM's original research priority areas. However, gaps remain and continued evidence generation and exploration into innovative approaches are needed. These should prioritise under-researched populations to improve the effectiveness and scalability of programmes.

More details can be found in the Research Landscape Analyses and the Research Agenda Revisited on the No Wasted Lives Website (www.nowastedlives.org).

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Seasonality of acute malnutrition and its drivers: A case study from eastern Chad

By Anastasia Marshak, Gwenaëlle Luc, Anne Radday and Helen Young



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Gwenaëlle Luc is a social anthropologist who currently works for the global Food Security Cluster, led by the Food and Agriculture Organization and World Food Programme, steering efforts to address food crisis amongst humanitarian, development and peace actors.



Anne Radday is the focal point for research communications and knowledge management at the Feinstein International Center, Tufts University. She has more than 15 years of experience in marketing and communications, knowledge management, knowledge product development, organisational strategy and external relations.



Helen Young is a Professor at the Friedman School of Nutrition Science and Policy, Tufts University, where she directs Feinstein's Research Program on Nutrition, Livelihoods and Conflict. Over the past 35 years her research has contributed to practical guidelines, policy changes, minimum standards, institutional learning and capacity development.

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Women getting water in Sila, Chad 2019

©Gwenaëlle Luc

SILA PROVINCE, CHAD

What we know: The existing evidence base on acute malnutrition seasonality is limited and fraught with methodological constraints resulting in the predominance of the assumption that acute malnutrition peaks during the 'lean season' or 'hunger gap'.

What this article adds: This article summarises findings from a 23-month study following approximately 200 children age 6-59 months across 89 households in eastern Chad. Results indicate that there are two peaks of acute malnutrition. The primary and larger peak occurs at the start of the rains corresponding to the first weeks of intermittent rain. Acute malnutrition prevalence declines during the rainy season as food insecurity increases and peaks again, but only slightly, immediately before the harvest. The results highlight the need to reconsider programme focus, design, timing and evaluation in light of the possible multiple seasonal peaks of acute malnutrition, likely corresponding to a set of different drivers.

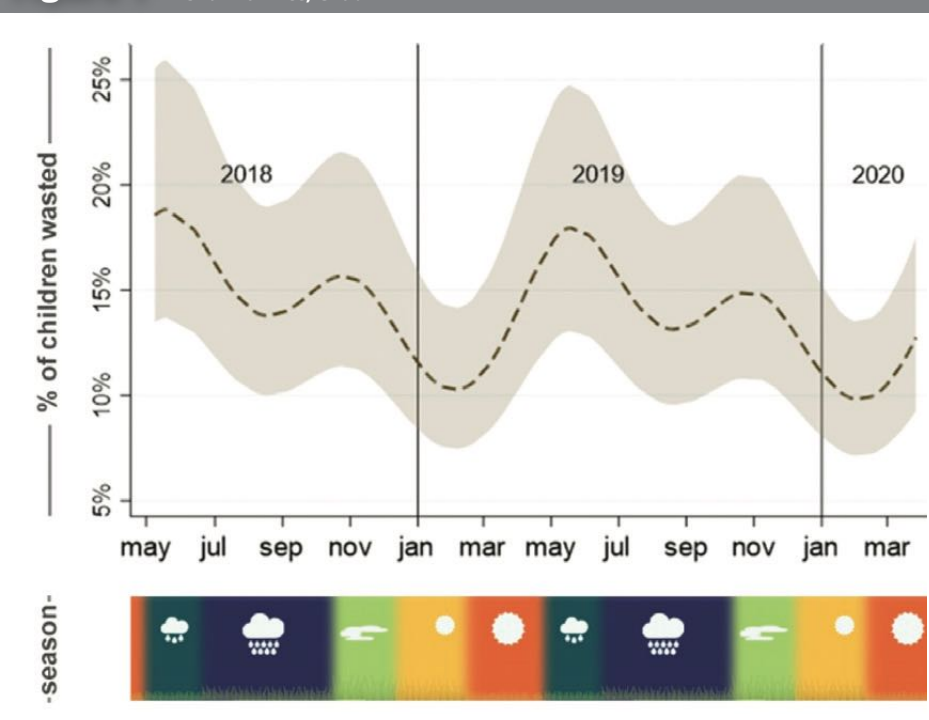
Background

Previous evidence has highlighted the role of seasonality in acute malnutrition where changes in environmental conditions trigger the underlying and immediate drivers of acute malnutrition and lead to increases in prevalence. In contexts with one main rainy season and a population that partially depends on farming for their livelihood, as is in Chad and much of the Sahel, there is a predominant narrative that acute malnutrition peaks once during the rainy season (the so-called 'hunger gap' or 'lean season') as a result of a combination of increasing food insecurity and disease burden, particularly malaria (Chambers et al, 1981; Devereux, 2012). This prevailing assumption is so strong in literature that seasonality is more often assumed than documented. However, the evidence base is relatively limited, only testing for the possibility of

one peak or frequently aggregating and/or comparing prevalence data across a small number of seasons (Marshak et al, 2020). Recently, there have been renewed efforts to better understand the seasonality of nutrition outcomes (FAO & Tufts, 2019; Young, 2020). This article summarises a research study that aimed to describe seasonal patterns of and relationships between acute malnutrition and some of the potential drivers including water contamination and livestock management among communities in eastern Chad in order to inform and influence programmes and policies that address persistent acute malnutrition in the region.

¹ Marshak, A., Luc, G., Radday, A., and H. Young (2021) "Seasonality of Acute Malnutrition and its Drivers in Sila, Province Chad: a mixed methods analysis". Feinstein International Center, February 2021 <https://fic.tufts.edu/research-item/seasonality-of-malnutrition-in-eastern-chad/>

Figure 1 Predicted prevalence and confidence intervals for wasting by month and season in Sila Province, Chad



Methodology

Concern Worldwide and Tufts University collaborated to conduct a two-year mixed-methods study in the Sila Region of eastern Chad based on a panel survey and qualitative interviews. Eight villages were purposely selected for the study based on Concern Worldwide's ability to access these throughout the year. Eighty-nine households with at least one child under 59 months of age were then randomly selected. The study followed the same households and their children monthly from May 2018 through to March 2020. As children aged out of the study (i.e., became over 59 months of age) they were removed from the study, while children who aged into the age criteria (i.e., turned six months of age) were added. By March 2020, the study included 212 individual children. In addition, data was collected on coliform contamination (a measure of the amount of fecal matter in the water) across the water chain for the 89 households. We used mixed-effects harmonic regression to analyse the seasonality of child wasting (weight-for-height z-score < -2 standard deviations). Qualitative data collection including focus groups, key informant interviews and semi-structured individual interviews was carried out in August 2018 and May/June 2019 – times that correspond to the two hypothesised peaks of wasting.

Key findings

Seasonal peaks in wasting

We identified two peaks of acute malnutrition within a calendar year (Figure 1). The highest peak was in May, corresponding to the locally identified season of rushash, characterised by intermittent rainfall that lasts for approximately three weeks prior to the start of the rainy season. We then saw a decline in the prevalence of acute malnutrition during the rainy season itself followed by a smaller secondary peak in October, immediately prior to the harvest. These findings highlight that the previously commonly held assumption around seasonality is not always accurate and, while the secondary acute malnutrition peak corresponds to the timing of high food insecurity and malaria risk, both the presence of the first peak and the improvement in wasting that occurs during the rainy season indicates that food security and malaria cannot be the main drivers of the first peak during rushash. This seasonal pattern may be generalisable to the greater Sahel region more broadly as the presence of two peaks in wasting is consistent with findings from a recent analysis of half a million child observations over 15 years of SMART surveys across the Sahel (Venkat, 2021).

When exploring the basic, immediate and underlying drivers of acute malnutrition, clear seasonal patterns emerge. As Table 1 depicts, all the drivers identified through both the qualitative and quantitative data collection appear to be seasonal. Findings suggest that the main peak of acute malnutrition prior to the start of the rains corresponds to limited water access, an increased concentration of animals at water sources and hence increased sharing of water

Table 1 Basic, immediate and underlying drivers of acute malnutrition, by season in Sila Province, Chad

			Season					
			Intermittent rain	Rainy	Harvest	Cool and dry	Hot and dry	
Basic Drivers	Environment	Rainfall						
		Temperature						
		Vegetation						
	Livelihoods	Livestock close to communities						
		Farmer-herder conflict						
		Women's workload						
		Move to temporary settlements						
Underlying drivers	Food insecurity	Food insecurity						
		Less time with children						
	Inadequate social and care environment	Poor hygiene behaviours						
		Insufficient health services and unhealth environment	Poor health seeking behaviour					
	Poor water access							
		Sharing water with animals						
		Animal disease						
Immediate Drivers	Food intake	Poor milk access						
		Reduced breastfeeding						
	Morbidity	Malaria						
		Respiratory illness						
		Diarrhoea						
Acute Malnutrition								
Note: darker colors indicate that a driver is a greater problem during the season compared to lighter colors. Blank cells indicate the driver was not identified by either qualitative or quantitative data.								

Note: darker colors indicate that a driver is a greater problem during the season compared to lighter colors. Blank cells indicate the driver was not identified by either qualitative or quantitative data.



Cattle herd in Sila, Chad, 2019

resources by animals and humans resulting in the consumption of contaminated water and decreased absorption of nutrients in children. The secondary and smaller wasting peak, immediately before the harvest, corresponds to the period of lowest food security and a greater burden of malaria. The encouraging news is that, during the cool dry season, wasting prevalence drops significantly.

Programme implications and broader recommendations

The results of the study reveal a far more complex and nuanced pattern of the seasonality of child acute malnutrition than previously assumed or documented indicating that all monitored drivers are seasonal and thus need to be addressed seasonally. These findings have direct implications for research, policy and programming as follows.

Invest in formative research on seasonality

When programmes aim to have a longer-term sustainable impact, formative research to identify seasonal patterns of acute malnutrition and the associated drivers is essential. Without a clear, evidence-driven understanding of seasonality,

programmes and policies could be targeting the wrong driver, or the right driver at the wrong time, resulting in significantly lower impact on acute malnutrition as well as wasting resources. A first step in this process is to document the local seasons and engage the community to identify drivers during each season. Similarly, quantitative data collection would require multiple within-year observations to correspond to the local seasons to identify how nutrition outcomes and their drivers might vary.

Promote a multi-temporal approach

There is a general agreement that we need to take a multi-sector approach to successfully prevent acute malnutrition. However, we must also take a multi-temporal approach – i.e., addressing the different drivers of acute malnutrition at relevant times and seasons. This is already a focus within the agricultural and food security sectors which have long since timed appropriate supplies and messaging according to the agricultural cycle. However, a seasonal mindset is far less common in other sectors, with a few exceptions, including the CMAM Surge Approach (Concern Worldwide, 2021). Grounding programme timing in a seasonal perspective would

foster greater efficiency across programmes as it would allow organisations to focus on specific drivers at specific times of the year, tailoring programmes and messaging accordingly.

Monitor and evaluate key outcomes by season

The seasonality of acute malnutrition and its drivers also has implications for data collection, be it the annual timing of SMART surveys, routine programme monitoring or general evaluations of programme impact on child nutrition. Mistiming data collection could result in either an under or over-estimation of nutrition outcomes as well as the programme impact on those outcomes. For example, in Chad, an evaluation of food security programmes on nutrition outcomes should occur at the end of the rainy season when that driver is likely to be most critical, while an evaluation of a programme on hygiene and sanitation is likely to show the greatest impact on nutrition at the end of the dry season. Furthermore, just as with seasonal programme implementation, focusing on monitoring and evaluations activities around the timing of when different drivers are at their seasonal worst could further increase efficiency and simplify planning and data collection.

Conclusion

Future programming and research must better understand and incorporate the seasonal nature of both acute malnutrition and all its drivers in order to be effective. This process starts with more formative mixed-methods longitudinal research, the design of and investment in evidence-driven multi-sector and multi-temporal programming and monitoring and evaluation that reflects the complex and nuanced seasonality of acute malnutrition and its drivers.

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Seasonal river in Sila, Chad, 2019



A health worker gives women therapeutic food for their malnourished children

Scale-up of severe wasting management within the health system: A stakeholder perspective on current progress

Research summary¹

This summary was prepared by Brenda Akwanyi who undertook the review together with Philip James, Natascha Lelijveld and Emily Mates on behalf of ENN



GLOBAL

What we know: Slow progress is being made towards scaling up the integration of severe wasting management into national health systems.

What this article adds: A qualitative synthesis of key informants' perspectives on the barriers and enablers to scaling up wasting treatment through routine health services was conducted by the Emergency Nutrition Network (ENN) between September 2020 and February 2021. Key informants shared examples of scale-up from pilot studies and case studies, emphasising the need to achieve best practice at scale. Programme coverage remains low and enablers proposed to improve this included an understanding of context-specific bottlenecks and the use of coverage as an indicator of programme success. Participants identified a need to remove the silos between nutrition and health workforce teams and to prioritise the community component of health systems, for example through investment in community health workers. Key informants also identified the need to adapt and simplify nutrition protocols to reduce the requirements and costs of ready-to-use therapeutic food and the need for more local production to shorten supply chains. Other important aspects identified for successful scale up were to minimise parallel reporting systems, ensure adequate technical expertise for data interpretation and translation, the integration of treatment service into existing community platforms and sustained advocacy, funding and political will from governments, donors and implementing agencies.

Background

There has been considerable progress towards integrating severe wasting management into national health systems in countries with high burdens of wasting. However, scale-up remains slow. This report offers a qualitative synthesis of key informants' perspectives on the barriers and enablers to scaling up wasting treatment through routine health services, conducted between September 2020 and February 2021. A total of 25 in-depth interviews were conducted with key informants from a range of national and regional government institutions, non-governmental organisations (NGOs), United Nations (UN) agencies and academic institutions. Interviews were guided by a semi-structured questionnaire based around the six pillars of the

World Health Organisation (WHO) health system strengthening framework.

Service delivery

While there has been progress towards scale up of severe wasting services, programme coverage remains low. Key enablers to improve coverage include understanding the importance of coverage as an indicator of treatment success and context-specific bottlenecks.

Several initiatives have aimed to identify the drivers of wasting to inform responsive programming over the last decade. While successful activities, including community outreach for severe wasting management and building demand for services, should now be implemented at scale, severe wasting has dropped off the agenda

in some countries. Maximising the core entry points for child health service delivery at facility and community level was identified as a key enabler to ensuring that severe wasting is included in investments into routine community outreach services. The role of community health workers (CHWs) and family members in the early detection of severe wasting is also central to reaching children at risk. Various adaptations for case detection such as the 'Family mid-upper arm circumference (MUAC)' approach have been developed to facilitate this and innovation, experience sharing and the scale-up of programme adaptations by health systems are needed. Key informants also felt that successful

¹ <http://www.enonline.net/scaleupseverewastinghealthsystem>

examples of using surge capacity to manage infectious diseases such as cholera, Ebola and COVID-19 could be utilised to improve the scale-up of severe wasting services. This would require recognising severe wasting as an urgent health condition.

Health workforce

The integration of severe wasting treatment within the health workforce was felt to require a dual approach of training health staff and ensuring their accountability to severe wasting outcomes and training nutrition staff in the principles of health system strengthening. This would diminish siloed teams and better empower primary health teams to plan and implement severe wasting treatment.

The community component of health systems was identified by key informants as the most neglected in terms of funding and institutionalisation. Lobbying is needed to increase investment for CHWs at subnational and national levels and to put in place appropriate legal regulation, certification and remuneration and simplified referral systems to support the work of CHWs.

Supplies

The costs of ready-to-use therapeutic food (RUTF) remain a stubborn barrier to the scale-up of severe wasting management and challenges to sustainable supplies of RUTF hamper the continuity of care and quality of services. Product adaptations and simplified nutrition protocols offer promising opportunities to decrease the amount of RUTF required, for example through adapted dosage regimes for severe wasting treatment, reducing logistics costs through local production, controlling misuse or 'leakage', improving

supply chain efficiencies and/or developing new, cheaper formulations. As these protocols undergo further piloting and review, the existing supply chains of national health systems need to be further reinforced. To date, 43 country governments have included RUTF in their essential medicine lists and are moving towards a more secure national supply chain. However, the COVID-19 pandemic added further strain on the global supply chain and highlighted the need for more local production of RUTF to shorten and potentially simplify the supply chain.

Health information systems

Key enablers to effective health information systems include minimising parallel reporting systems and ensuring the availability of technical expertise to interpret data on severe wasting so that this can be translated into programmatic action. Identified bottlenecks also need to be tackled within the District Health Information System 2 (DHIS2) which is already used in 73 countries so as to maximise its potential to support health workers to better anticipate and manage fluctuations in demand for severe wasting services. The intentional embedding of technical expertise in nutrition information systems within maternal and child health information and/or monitoring and evaluation departments could also improve the analysis and use of nutrition data. For example, key informants described how governments with established e-health platforms could feasibly integrate nutrition data into existing infrastructure at scale and pilot programmes have been successful in using digital platforms to integrate severe wasting data. Engaging with scalable e-health platforms and leveraging them to scale up e-nutrition digital investment is now needed.

Financing

Full and accurate budgeting is required to implement severe wasting treatment at scale, yet the allocations for severe wasting treatment in some national and subnational budgets is insufficient. The ongoing costing exercise for country action plans that target wasting (Global Action Plan for wasting outcome 4) offer an opportunity to ensure realistic national and subnational costing and budgeting for severe wasting. Involving health systems specialists in these budgeting activities could further improve financial projections.

Currently, most severe wasting treatment services are largely funded through international humanitarian or emergency financing mechanisms which can be unpredictable and inefficient. They also tend to use parallel systems that do not build national capacity. Securing adequate and sustainable longer-term funding streams for wasting costs requires innovative funding mechanisms and the informants proposed many possible opportunities. These included expanding innovative regional multilateral development finance initiatives, such as the Global Financing Facility, and exploring regional government procurement services to reduce the costs of essential supplies.

Leadership and governance

The ongoing national and global discussions on universal health coverage (UHC) offer a huge opportunity to ensure the health consequences of severe wasting are prioritised, especially for high burden countries. The Tokyo Nutrition for Growth (N4G) working group on nutrition has laid down some priority commitments that can be leveraged for these discussions. There are many examples of health services that achieve impressive coverage, such as the community integrated management of childhood illnesses (C-IMCI) and the expanded programme on immunisation (EPI). These provide platforms into which severe wasting services should be integrated to maximise coverage. Key informants also suggested that support infrastructure from agencies needs to be maintained alongside government prioritisation of wasting and that this should involve consistent messaging on the importance of scaling up severe wasting management from all stakeholders who influence government policy and funding.

Conclusion

Many successful examples of scaling up severe wasting management from pilot studies and case studies exist but the need to achieve best practice at scale remains. During this qualitative synthesis, key informants highlighted the need for sustained advocacy and funding and political will from governments, donors and implementing agencies to continue progress and to maximise opportunities including the current efforts towards achieving UHC.

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A nurse measures the height of a malnourished child at a health clinic in DRC

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Link NCA offers a new opportunity to study drivers of concurrent wasting and stunting (WaSt)

By Lenka Blanárová and Grace Heysfield

Community discussion on causal mechanisms of stunting, Grand Cape Mount, Liberia, 2019



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Liberia

What we know: Link NCA (Nutrition Causal Analysis) is an established methodology for analysing the multi-causality of undernutrition to inform context-specific nutrition-sensitive programming.

What this article adds: This article summarises a recent Link NCA study covering five counties grouped into three regions in Liberia that extended its original research questions revolving around stunting to include analyses of concurrent wasting and stunting (WaSt). Logistic regression revealed significant associations between WaSt and younger age (<24 months) across all three regions. Further associations were apparent in one of three regions including episode(s) of diarrhoea during two weeks preceding the survey; child being taken care of by a non-immediate family member; medium to high score on reduced coping strategy index and/or caregivers' perceived low level of social support. A child's measles vaccination and caregiver's perceived breastmilk sufficiency were protective factors in one region. Broader results revealed limited access to markets as the key root cause of stunting in this context. The authors conclude that analyses focusing purely on stunting would not allow for the design of interventions that address risk factors for WaSt for those who are at the highest risk of mortality. Shared risk factors for both stunting and WaSt should therefore be examined using Link NCAs in contexts with high burdens of wasting and stunting to better inform programme design.

Context

Wasting and stunting tend to be addressed as separate issues despite evidence of common causality and the fact that children may suffer simultaneously from both conditions (WaSt). Children with concurrent wasting and stunting may have comparable mortality risk to children with severe wasting only and they also tend to be more severely wasted than children who are only wasted (Wells et al, 2019). The heightened risk of mortality associated with WaSt means that further understanding of the aetiology, prevention, case-finding and treatment of children with WaSt, as well as the extent to which current interventions are reaching these children, is urgently required. Work on the mechanisms of the association between wasting and stunting on mortality may prove useful. Consideration should be given to

encouraging the routine reporting of the prevalence of WaSt from nutritional anthropometry surveys, broader surveys (e.g. Multiple Indicator Cluster Surveys and Demographic and Health Surveys), surveillance systems and other nutrition information systems that collect and report on anthropometric data (Myatt et al, 2018).

As a part of extensive formative research to better understand context-specific causes of stunting and related behaviours in five counties in Liberia (Grand Bassa, Grand Cape Mount, Rural Montserrado, Rivercess and Sinoe), a Link NCA was carried out to identify and categorise risk factors for stunting across the study area. Specifically, the Link NCA aimed to describe interactions between identified risk factors, their seasonality and historical variations as well as most vulnerable groups among the population. The compiled ev-

idence was used to develop a Theory of Change with actionable multisector recommendations to address identified risk factors, targeting most vulnerable communities, households, and children, to feed into programme design. A secondary research question emerged during the study's qualitative inquiry, inspired by community members' perception of malnutrition as wasting and not stunting. Therefore, the quantitative analyses conducted during the Link NCA were extended to wasting and concurrent wasting and stunting, to explore potential interactions of risk factors among multiple nutrition outcomes. In this article we focus on the extended WaSt analyses.

Methodology

The Link NCA is a mixed methods study, as described in Box 1. During the preparatory phase an in-depth literature review was undertaken to identify hypothesised risk factors for field testing during the qualitative inquiry and a quantitative survey. The second stage of this study, the qualitative inquiry, covered 10 sampled locations (two per county) across various livelihood zones and included 131 focus group discussions, 52 semi-structured interviews and 29 observations with over 1,300 participants. All qualitative data was recorded manually in a notebook and reproduced electronically at the end of each data collection period. The data was grouped by themes and analysed using qualitative content analysis methods.

¹ Region 1 covered Grand Cape Mount County, Region 2 Rural Montserrado and Grand Bassa Counties and Region 3 Rivercess and Sinoe Counties.

² Indicators for assessing infant and young child feeding practices Part 2 Measurement. Available at: http://www.unicef.org/nutrition/files/IYCF_Indicators_part_II_measurement.pdf

³ Maxwell, Daniel, Jennifer Coates, and Bapu Vaitla (2013). *How Do Different Indicators of Household Food Security Compare? Empirical Evidence from Tigray*. Feinstein International Center, Tufts University: Medford, USA.

Box 1 About Link NCA

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

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

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

The quantitative survey included the collection of anthropometric measurements of children under five years of age and 45 household indicators in 1,094 households across all five counties of the study zone, grouped into three regions, based on the 2016 Malaria Indicator Survey precedent.¹ Household indicators included a range of standard and/or adapted indicators used in sectoral cross-sectional surveys, for example, Individual Dietary Diversity Score (IDDS),² reduced Coping Strategy Index (rCSI)³ and others. The quantitative data was collected via an electronic questionnaire downloaded onto mobile devices. Paper anthropometry and mortality forms were maintained for verification before nightly upload of data onto the online platform KoBoToolbox. After final compilation, all data was exported in the form of an Excel spreadsheet and analysed with STATA software. The anthropometric data was analysed using ENA for SMART software (2011 version).⁴ The analyses included bivariate logistic and linear regressions (WaSt children vs. children with no anthropometric deficits). The final stage involved the synthesis and triangulation of data, which included design of causal pathways based on community perceptions, available scientific evidence and generated evidence.

Results

Communities visited during the qualitative inquiry did not perceive stunting as a medical condition and therefore discussions around its causal pathways were challenging. Despite a discrepancy of perceived severity of this form of malnutrition, there was a consensus that stunting differed from natural and normal shortness. A stunted child was described as being 'tight' in the body, meaning that he/she could not grow into his or her full height for age.

'Tightness' is differentiated from shortness if a child progressively falls further behind his/her peer's growth. On the other hand, a wasted child was described as 'dry', meaning that his/her ribs protrude and his/her legs are 'too skinny to carry him/her.' Other nicknames for wasting tease at a child's physical appearance, including dry and scaly like a 'chameleon' or 'Mister Bone Chairman.' Causes of wasting were directly or indirectly linked to perceived negligence of the child's mother. A child is perceived at risk of becoming wasted if s/he 'does not get food on time', if s/he is not washed frequently enough and/or has frequent diarrhoea. Unlike general morbidities, a 'dry' child is more likely to be perceived to have been a victim of witchcraft.

Community aetiology of stunting roughly fell into three categories: hereditary, environmental and spiritual. The dominant belief is that a 'tight' child is short because his/her parents are short. A child could become stunted if s/he was not well taken care of in the home - this referred to both nutrition and household hygiene. A few community members identified pregnancy and lactation as influential times that could influence a child becoming or not becoming stunted, but this was typically recorded in areas that had been sensitised to the health benefits of breastmilk for child health. As was true for any other protracted undesirable situation (health, economic, etc.), a 'very very tight' child could have been vexed by witchcraft.

The overwhelming consensus was that boys were more vulnerable to stunting than girls. Boys were said to be greedy when breastfeeding. If their nutritional needs or preferences were not satisfied from infancy (meaning insufficient food, undesirable food, or both), they were believed to be frustrated and unable to grow.

A summary of terms used to refer to stunting and wasting are included in Table 1. It is important to note that terms used to refer to wasting implied a medical condition, while stunting was regarded as growth failure. No special terms were reported for a child who was concurrently wasted and stunted - the child could be called 'tight and dry,' or some combination of the below terms. A child who is 'dry' was identified as needing urgent treatment in the health facility, but no therapeutic treatment was implied for stunting.

The quantitative survey revealed a prevalence of global chronic malnutrition (GCM) on the basis of height-for-age less than -2 z-scores (HAZ < -2) as above 30% in all three regions of the study, all classified as 'very high' according to WHO prevalence thresholds. Prevalence of global acute malnutrition (GAM) on the basis of weight-for-height z-score (WHZ < -2) ranged from 5.4% to 8.7%, classified as 'medium' according to the WHO thresholds. WaSt prevalence ranged from 3.4% to 4.1%. All children who were wasted and stunted were also underweight (30), as depicted in Figure 1. A majority of children who were stunted were not also underweight or wasted (150). Few children (17) were wasted, underweight, and not stunted.

Table 1 Local terms used to describe stunting and wasting

Stunting	
Local term	Meaning
Tight	Short for age
Short butt AK-47	Short for age
NGO - "Never grow old"	Unable to grow to potential
Small in the body	Short for age
Forever young	Looks younger than he should
Cornerstone	Never changing, never growing up ⁵
Little man	Small for age, with a face like an old man
Small man in the iron jacket	Very tight in the body Increased severity
Lazy child	The baby is too weak to grow
Iron rock	A child who looks older than his age, but stooped like an elderly person
Wasting	
Dry	Dry skin, no fat in the body, child who is very sickly
Witch child	Child is a witch the child is flying at night
Chameleon	Appearance like a lizard
Boney boney	Appearance like a dry boney fish
Malnourished	The child is very dry, weak, pure, dirty, dry and small in size
Win child	Poor birth spacing ⁶
Dirty child	The child is not cared for by his or her parent nor caregivers
Weakly weakly	Child who is sicker than other children
Mr. Bone or Bone Chairman	The child's ribs and others bones of his/her body can be seen and counted
Skinny-winnie	The child's legs and arms are very dry and his stomach is big

Logistic regressions, by region, revealed significant associations between concurrent wasting and stunting and the indicators presented in Table 2. Indicators are highlighted in orange if exposure is a risk factor significantly associated with higher odds of WaSt and green if exposure is a protective factor significantly associated with lower odds of WaSt ($p < 0.05$). A child who is less than 24 months of age was more likely to be WaSt. This was true across all three regions of the study. Regional variations in other risk factors should be interpreted with caution, as correlations were limited by the small percentage of children with WaSt and should not be considered relevant to only one region without further investigation. Such risk factors include the child having episode(s) of diarrhoea during the two weeks preceding the survey, the child being taken care of by a non-immediate family member, medium to high reduced coping strategy index (rCSI) and/or caregiver's perceived low level of social support. A

⁴ Children with missing or flagged WHZ and HAZ information were dropped; WHO 2016 flags applied.

⁵ The child is the oldest of all the children in the community but he/she is very short and small.

⁶ The child was 'won' by parents by having sex too soon after the preceding baby.

Table 2 Select indicators' association with WaSt

Risk factor <i>Logistics regression</i>					Region I – Grand Cape Mount County <i>Children age 6-59 months</i>		Region II-Grand Bassa/ Rural Montserrado <i>Children age 6-59 months</i>		Region III- Rivercess/ Sinoe <i>Children age 6-59 months</i>	
Indicator	N	n	Prevalence	Design effect	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]	P-value	Odds Ratio [95% CI]
Age group <24 months	356	128	36.0[31.5-40.7]	0.8	0.002	11.22[2.37-53.07]	0.008	6.30[1.63-24.40]	0.029	5.90[1.20-29.09]
Age group <36 months	356	198	55.6[51.0-60.2]	0.8	0.033	9.52[1.20-75.33]	0.115	3.48[0.74-16.44]	0.114	5.41[0.67-44.03]
Measles vaccine (confirmed by card)	286	194	67.8[62.1-73.1]	1.0	0.508	1.70[0.35-8.20]	0.596	0.65[0.13-3.20]	0.033	0.15[0.03-0.86]
Diarrhoea [during 2 previous weeks]	350	91	26.0[21.4-31.2]	1.1	0.925	0.94[0.24-3.62]	0.557	1.44[0.43-4.84]	0.024	6.26[1.27-30.84]
Child watched by an auntie	270	50	18.2[12.6-25.6]	2.0	0.569	0.54[0.07-4.42]	0.621	1.53[0.29-8.14]	0.045	5.40[1.04-28.03]
Perceived breastmilk sufficiency	170	156	91.8[86.0-95.3]	1.2	0.864	0.83[0.10-7.19]	0.282	0.45[0.11-1.92]	0.023	0.14[0.03-0.77]
Individual Dietary Diversity (IDDS) Score zero	159	16	10.0[6.1-16.1]	1.0	0.983	1.02[0.12-8.69]	Perfect collinearity		0.001	24.20[3.87-151.36]
Mother perceived external support: Lowest	275	52	18.9[13.5-25.8]	1.7	0.973	0.97[0.20-4.74]	0.009	9.20[1.73-49.06]	0.593	0.55[0.06-4.85]
Reduced coping strategies index: Medium or high	350	111	31.7[25.0-39.3]	2.2	0.129	0.20[0.03-1.59]	0.607	0.58[0.07-4.65]	0.004	7.54[1.88-30.27]
Borrowing of food (3 of 7 days)	351	70	19.9[14.4-27.0]	2.2	Perfect collinearity				0.049	4.30[1.01-18.38]
Reducing number of meals in the day (3 to 7 days)	351	83	23.7[17.8-30.7]	2.1	Perfect collinearity				0.017	6.00[1.38-26.14]
A family member died during the recall period	356	14	3.9[1.9-8.0]	1.9					0.004	15.64[2.44-100.16]

child's measles vaccination and caregiver's perceived breastmilk sufficiency came out as protective factors in Region III. The analyses showed almost no overlap of risk factors for stunting and WaSt apart from the mining/concession livelihood zone being a risk factor for wasting and stunting and potentially for WaSt. Some risk factors, including age group <24 months, measles vaccination and rCSI were associated with both wasting and WaSt but not stunting.

Broader results revealed that the dominant overarching pathway to stunting in this context took roots in limited access to markets, which appear to exacerbate a variety of household factors, including personal and environmental hygiene, as well as consumption of a diverse and nutritious diet. The study also substantiated evidence regarding the role of women's nutritional status and social support in the health and well-

being of their child. The nutritional status of women, assessed using mid-upper arm circumference (MUAC), was significantly linked with a child's HAZ score. In agricultural livelihoods zones, where access to resources is intrinsically linked with the availability of external support, children of mothers with perceived low levels of such support and who were not part of external support groups, were potentially at a greater risk of stunting.

Discussion and conclusion

The Link NCA study in Liberia was completed as part of a three-assessment package of formative research, which informed a project design process for the Liberia WASH Consortium (LWC), including Action Against Hunger, Concern Worldwide and Water Aid. The Link NCA study yielded meaningful evidence regarding stunting and WaSt that informed the design of a holistic intervention targeting both forms of undernutrition. Analyses focusing purely on stunting would not necessarily allow for a design of interventions encompassing concurrent forms of undernutrition, for example by addressing mothers' breastmilk production, which the analyses found to be solely associated with WaSt.

Due to the multifaceted nature of findings, and facilitation of the proposal development by an external partner, consortium partners were led to design a novel project and not repeat status quo programming, putting children at the highest risk of mortality (WaSt) at the heart of programme design. On the basis of this experience, we recommend that contexts with high stunting and wasting burdens use Link NCA studies to explore risk factors for WaSt to ensure that programmatic recommendations are tailored to address the needs of children at most risk, according

to the specificities of the intervention zone.

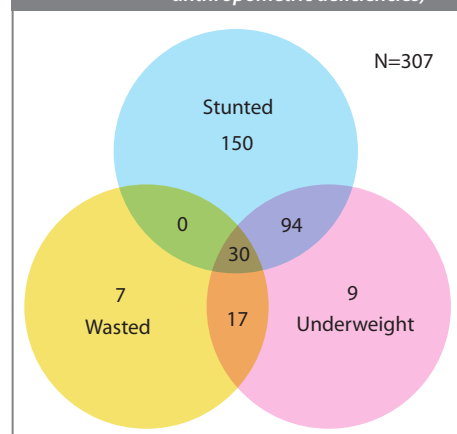
It must be acknowledged that this Link NCA study did not substantiate evidence to suggest effects on linear growth slowing as a child's wasting progresses, or vice versa. The current research design is limited to a snapshot of a child's nutritional status at the time of the data collection as opposed to longitudinal studies, which collect the relevant data points over an extended period of time. In addition, while stunting is less influenced by seasonality than wasting, available cross-sectional data did not substantiate potential seasonal stresses that influence growth faltering, whether that be wasting or stunting. Therefore, it is important to consider an integration of longitudinal evidence in the structuring of causal pathways, especially regarding the influence of wasting on stunting and vice versa.

More details on the methodology and findings can be found in the full report which is available from https://linknca.org/etude/grand_bassa_great_cape_mount_rural_montserrado_rivercess_and_sinoe_counties.htm

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

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Figure 1 Number of cases by anthropometric deficiency (excluding children with no anthropometric deficiencies)



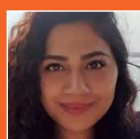
A community garden provides livelihoods and asset support to people who are food insecure in Chad

Estimating the burden of wasting during COVID-19 based on empirical experiences in the Sahel

By Saidou Magagi, Sumra Kureishy, Jessica Bourdaire and Katrien Ghoos



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World Food Programme RBD would like to acknowledge the collaborating partners of the model presented in this article, including UNICEF and European Civil Protection and Humanitarian Aid Operations (ECHO), as well as the donors, the governments and the food security and nutrition working groups/clusters.

BURKINA FASO, MALI, MAURITANIA, NIGER, CHAD & SENEGAL

What we know: An incidence correction factor (K) of 1.6 is generally used to estimate the burden of wasting; some countries report that this leads to underestimates.

What this article adds: A revised mathematical model was developed to address a perceived risk of underestimation of the burden of wasting in the six Sahelian countries. Drawing on previous work, a mathematical model was devised to improve estimates and account for food insecurity, seasonal variation and the impact of COVID-19. It drew upon existing national and regional admissions data from community-based management of acute malnutrition programmes (2014-2019), prevalence data from nutrition surveys, population data from national censuses and food and nutrition insecurity data from the Cadre Harmonisé. Programme coverage was assumed to be 100% to estimate the total burden for the period covering April to December 2020. Estimations for 2020 found a burden of 5.35 million wasted children, higher than the 4.54 million originally projected. The mathematical model allowed for the estimation of region-specific incidence correction factors per quarter accounting for food insecurity, seasonal variations and COVID-19.

Introduction

Wasting is a global public health problem that results in increased child morbidity and mortality. It was estimated in 2019 that the global prevalence of wasting in children under five years of age was 47 million, with a prevalence of 7.9 million wasted children in West and Central Africa (UNICEF, WHO & World Bank, 2020). Prevalence is estimated through cross-sectional surveys. However, as prevalence data is based on a snapshot in time, some cases will be missed and the number of children affected by wasting underestimated. Incidence estimates, captured through longitudinal cohort studies, capture new cases over time and are therefore a more accurate estimate of the burden (Insanaka et al, 2016). When longitudinal studies are unavailable, burden can be estimated using the context-specific relationship between prevalence and incidence (Bulti et al, 2017). The average duration of disease reflects when a prevalent case has recovered or dies or has moved out of the population of interest. When the incidence is stable for the duration of the disease,

prevalence is estimated as a product of incidence and the average duration of disease. Hence, through simple substitutions, the burden simplifies to the population size, prevalence and incidence correction factor (K). Box 1 provides details on the current formula used to estimate the burden of wasting in this way (Bulti et al, 2017).

Research shows that governments, United Nations (UN) agencies and community-based management of acute malnutrition (CMAM) implementing partners around the world use 7.5 months as the average duration of an untreated severe acute malnutrition episode for a one-year planning period which provides an incidence correction factor (K) of 1.6 (Garenne et al, 2009). However, some countries have recently reported that the use of this single K has led to burden underestimation (Bulti et al, 2017).

An urgent request was made to the World Food Programme (WFP) regional office for West and Central Africa by the regional (West Africa) Food Security and Nutrition Working Group

Box 1 Current formula used to estimate burden of wasting

$$\text{Prevalence} = \frac{\text{Number of wasted children 6-59 months during a specific time period}}{\text{Total population during the same time period}}$$

$$\text{Incidence} = \frac{\text{Number of new cases of wasted children 6-59 months in a given time period}}{\text{Number of children 6-59 months at risk of wasting in the same period}}$$

$$\text{Prevalence} = \text{Incidence} \times \text{Average duration of disease episode}$$

$$\text{Incidence} = \text{Prevalence} \times (\text{Duration of planning period} \div \text{Average duration of a disease episode})$$

$$\text{Burden} = \text{Population 6-59 months} \times [\text{Prevalence} + \text{Incidence}]$$

$$\text{Burden} = \text{Population 6-59 months} \times [\text{Prevalence} \times (1 + \text{Incidence correction factor (K)})]$$

$$\text{Where: } K = \text{Duration of planning period} \div \text{Average duration of a disease episode}$$

(FSNWG)¹ in 2020 to address any risk of underestimating the burden of wasting for the G5+1 Sahel countries (Burkina Faso, Mali, Mauritania, Niger, Chad and Senegal) as a result of the COVID-19 pandemic and accounting for food insecurity and seasonal variation. In response, we developed a mathematical model, based on the burden model developed by Mark Myatt (Myatt, 2012) and regional experiences. This article outlines the steps taken and the equations used to obtain this revised model for burden estimation.

Methods

Sources of data and assumptions

The model was generated based on the experiences and lessons learned from previous burden analyses carried out and existing national and regional CMAM admissions data from the previous five years (2014-2019), prevalence data from nutrition surveys in the G5+1 countries, population data from national censuses and food and nutrition insecurity data from the Cadre Harmonisé.² Programme coverage was

assumed to be 100% as the model aimed to estimate the total burden for the period covering April to December 2020. The model was reviewed for technical validity and endorsed by the regional FSNWG.

With the rise in the number of wasted children aged 6 to 59 months during the lean season (April-September) and regional experiences dictating a wide variation in the average duration of an episode of wasting, the regional FSNWG, along with national nutrition and food security clusters, agreed that the proposed pattern of wasting and the average duration of an episode should be based on standard calendar quarters.³ Moreover, since the pandemic was only declared after March 2020, the incidence correction factor of K=1.6 was used to estimate the burden of wasting in quarter one.

Steps to adjust for food insecurity, seasonal variation and COVID-19

The average duration of a wasting episode was estimated as the product of the planning period per quarter (Q_n) and the quotient of the global average duration of an untreated episode (7.5 months) for a one-year planning period (Box 2, equation 1). Mean smoothing of the three months of each quarter was applied to the average duration of an untreated episode to reduce and control for random variation (STE) (Box 2, equation 2). The incidence correction factor per quarter adjusted for food insecurity was calculated as the quotient of the planning period per quarter (Q_n) and the smoothed average duration of an untreated episode (STE) (Box 2, equation 3). The burden of wasting was then adjusted based on the incidence correction factor for food insecurity per quarter (FSQ_n), as detailed in Box 2 (equation 4). To adjust for seasonal variation, admissions data from the previous five years was analysed and the mean was smoothed to determine the burden averaged across the previously mentioned quarters (Q_n) (Box 2, equation 5).

To determine the impact of the COVID-19 pandemic on the burden of wasting, experiences and CMAM, admissions data from the Ebola crisis (2014-2016) and World Health Organization data (WHO, 2016) were used to forecast an increase in the expected number of new cases for each quarter (Box 2, equation 6). The approach was then used to estimate the burden of wasting adjusted for food insecurity, seasonal variation

Box 2 Revised formula for the calculation of the burden of wasting based on the adjusted incidence correction factor for food insecurity, seasonal variation and COVID-19 per quarter

(1)	Average duration of an untreated episode by standard calendar quarters (ATE)	=	Average duration of an untreated episode	
			Duration of planning period	
(2)	Smoothing of the average duration of an untreated episode between quarters (STE)	=	(Q _n + 1) – ATE	
(3)	K = Q _n ÷ STE			
(4)	Burden adjusted for food insecurity per quarter (FSQ _n)	=	N × P [1 + K]	
(5)	Adjusted correction factor for seasonal variation per quarter (SVQ _n)	=	Average observed number of programme admissions per year over the past 5 years	
			Total number of quarters (Q _n)	
(6)	Burden adjusted for food insecurity, seasonal variation & COVID-19 per quarter (FSQ _n + SVQ _n + COVIDQ _n)	=	Burden adjusted for food insecurity per quarter (FSQ _n)	Quarterly incidence factor for seasonal variation (SVQ _n)
			×	Quarterly impact factor of COVID-19 (IFCOVIDQ _n)
(7)	Burden of Wasting for Apr-Dec 2020	=	Q1 Burden adjusted for FSQ _{Q1} + SVQ _{Q1} + COVIDQ _{Q1}	+ Q2 Burden adjusted for FSQ _{Q2} + SVQ _{Q2} + COVIDQ _{Q2}
			+ Q3 Burden adjusted for FSQ _{Q3} + SVQ _{Q3} + COVIDQ _{Q3}	+ Q4 Burden adjusted for FSQ _{Q4} + SVQ _{Q4} + COVIDQ _{Q4}

where;

Q_n = Planning period per quarter; Q1, Q2, Q3 and Q4

Average duration of an untreated wasting episode = 7.5 months

Duration of planning period = 12 months

N = Population size

P = Prevalence

K = Adjusted incidence correction factor for food insecurity per quarter

IFCOVIDQ_n = Impact factor of COVID-19 per quarter (Q1, Q2, Q3 and Q4)

¹ The regional Food Security and Nutrition Working Group (FSNWG) is based in Dakar, Senegal. Under the coordination of the Office for the Coordination of Humanitarian Affairs, it consists of the regional representation of UN agencies, donors, and international non-government organisations who have interventions in West and Central Africa.

² The Cadre Harmonisé is West Africa's equivalent to the Integrated Phase Classification (IPC) which provides a meta-analysis of data from existing information systems on agriculture, household economy, food consumption patterns, health and nutrition to classify the severity of acute food and nutrition insecurity.

³ The standard calendar quarters were defined as January – March (quarter 1), April – June (quarter 2), July – September (quarter 3) and October – December (quarter 4); the planning periods per quarter were defined as 3 months for quarter 1, 6 months for quarter 2, 9 months for quarter 3 and 12 months for the last quarter.

and COVID-19 for the period of April to December 2020 (Box 2, equation 7).

Results

In the first step, estimating the smoothed duration of an episode for food insecurity per quarter, the incidence correction factors were found to be 1.6, 1.85, 2.06 and 2.18, respectively. Table 1 shows the resulting adjusted incidence correction factors for food insecurity per quarter. These correction factors were found to increase substantially per quarter; the correction factor K increased more than 30% by the fourth quarter. The second estimation step found an attribution of 20–25% from seasonal variation on the burden of wasting.

For the impact of COVID-19 on wasting, the third estimation step found an increase in the initial expected number of new cases by 0% in Quarter 1, 10% in Quarter 2, 15% in Quarter 3 and 20% in Quarter 4. This step accounts for the negative impact of the restrictive measures on access to healthcare, delays in the diagnosis and treatment of wasting, access to food supplies and other socio-economic aspects (WFP, 2020).

Table 2 shows the initial burden of wasting, calculated using an incidence correction factor of 1.6 and the revised burden adjusted for food insecurity, seasonal variation and COVID-19 for 2020. The burden of wasting calculated with a K=1.6 was found to have vastly underestimated the annual burden of wasting by about 0.8 million children. This corresponds to an underestimation of 18% of the burden initially forecasted for April to December 2020.

Discussion

The improved burden estimates were used to identify priority geographical areas in need of urgent assistance. Overall, the revised burden estimates enabled the region to adjust and orient planned activities and resources to address wasting in the hardest hit areas.

Similarly, the G5+1 countries were able to use the revised burden estimates to inform national hotspot analyses which led to the early identification of priority areas and to the adaptation of the WFP's wasting prevention and treatment response. These adaptations led WFP to increase its reach to beneficiaries by an additional 15 to 30% across the six countries. Moreover, the revised burden estimates have been used to guide regional research, such as the ongoing Fill the Nutrient Gap analysis which identifies and models multi-sector approaches to prevent malnutrition in the Sahel.

Through clear and organised consultations and consensus building with countries (governments, non-governmental organisations and UN agencies), the revised model was able to generate estimates in a coordinated manner and ensure buy-in, a key lesson learned during this experience.

Evidence-based decision-making is essential to creating sustainable change and, given the COVID-19 pandemic, the model enabled the

Table 1 Estimates of the adjusted incidence correction factor for food insecurity per quarter

Quarters	Months	Planning Period (months)	Average Duration of Episode (ATE) by Quarters	Smoothing of the Average Duration of Episode (STE) between Quarters	Incidence Correction Factor
Q1	Jan - Mar	3	N/A ^a	N/A ^b	1.6
Q2	Apr - Jun	6	3.75	3.25	1.85
Q3	Jul - Sept	9	5.63	4.38	2.06
Q4	Oct - Dec	12	7.50	5.50	2.18

^{a,b} The region continued to use the global 1.6 incidence correction factor since COVID-19 was only declared a pandemic after March 2020

Table 2 Wasting burden estimates for 2020 adjusted for food insecurity, seasonal variation and the impact of COVID-19 in G5+1 Sahel countries^a

GAM	TOTAL	Change
Initial Burden 2020 ^b	4,537,948	NA
Revised Burden (with FS + SV)	4,865,712	7%
Revised Burden (with FS + SV + C19)	5,347,833	18%

SAM	TOTAL	Change
Initial Burden 2020 ^c	1,318,660	NA
Revised Burden (with FS + SV)	1,434,787	9%
Revised Burden (with FS + SV + C19)	1,578,129	20%

MAM	TOTAL	Change
Initial Burden 2020 ^d	3,219,287	NA
Revised Burden (with FS + SV)	3,430,925	7%
Revised Burden (with FS + SV + C19)	3,769,705	17%

^a The improved burden estimates were calculated for Burkina Faso, Mali, Mauritania, Niger, Chad and Senegal.

^{b,c,d} The initial burden for 2020 was calculated using the Harmonised Framework for March 2020 which relies on the global incidence correction factor of 1.6.

region to produce adequate burden estimates. By applying standard calendar quarters, the model was able to account for the seasonal variation observed in the burden of wasting across the Sahel region.

Conclusion

The revised mathematical model presented in this article allowed for the estimation of region-specific incidence correction factors per quarter accounting for food insecurity, seasonal variations and COVID-19. The quarterly values of correction factors estimated for 2020 based on population, prevalence and coverage data from 2014 to 2019 found a burden of 5.35 million wasted children which appears to be a more accurate estimate of the burden than the 4.54 million originally estimated. In the absence of up to date health and nutrition data during COVID-19, this approach using incidence correction factors adjusted for food insecurity, seasonal variation and COVID-19 may be considered for improving burden estimates of wasting in G5+1 Sahel countries.

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ETHIOPIA

What we know: The use of educational videos is emerging as an effective mode of health education including to support optimal infant and young child feeding.

What this article adds: GOAL has begun using breastfeeding educational videos within its Maternal, Infant and Young Child Feeding (MIYCF) and Management of 'at risk' Mothers and Infants (MAMI) programme in Gambella refugee camps in Ethiopia. Eight Global Health Media Project (GHMP) breastfeeding education videos were translated into the local language and shown to mothers with infants under six months of age attending MIYCF/MAMI clinics over the course of eight weeks between August and December 2020. Changes in maternal breastfeeding knowledge and practice were assessed to determine the feasibility of the approach through semi-structured interviews at baseline and endline and, at endline, through focus group discussions with mothers and key informant interviews with health workers. A total of 93 mothers were included in the study. At baseline, 100% of the mothers practiced breastfeeding and 92.5% practiced early initiation of breastfeeding (EIBF). At endline, analysis of primary outcomes demonstrated a statistically significant difference in knowledge about introduction to complementary feeding (increased by 8.7 percentage points) but no significant differences in other primary breastfeeding practice and knowledge outcomes. Analysis of secondary outcomes showed a substantial change in knowledge, including improvement in knowledge about the advantages of EIBF, attachment and positions during breastfeeding and signs to identify that the baby is hungry. Qualitative results showed that mothers and health workers found the videos acceptable, useful and effective. GOAL now plan to implement this video-assisted counselling in both MIYCF and MAMI programmes in the Gambella programme with increased frequency and on bigger screens. In addition, community health workers will show the videos on tablets to family members and key influencers to address wider barriers to optimal breastfeeding practices.

Use of educational videos to improve maternal breastfeeding knowledge and practices in Ethiopia

By Ritu Rana, Hatty Barthorp, Liya Assefa, Alemayhu Beri and Mary T Murphy



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The authors would like to thank the Global Health Media Project (GHMP) for supporting the translation and narration of selected GHMP videos in Nuer language and Nächstenliebe Weltweit for supporting the implementation.

Background

Optimal breastfeeding practices are associated with reduced morbidity and mortality in young children (Sankar et al., 2015). For infants under six months, exclusive breastfeeding (EBF) is recommended by the World Health Organization (WHO) as the optimum diet. However, breastfeeding women may experience challenges to maintaining EBF for the first six months. A review documented various barriers to EBF in low- and middle-income countries (LMICs), including maternal perceptions of insufficient breastmilk, breastfeeding problems and lack of counselling (Kavle et al., 2017). These barriers are often not adequately addressed through infant and young child feeding (IYCF) counselling programmes.

GOAL has been implementing nutrition programmes, including maternal infant and young child feeding (MIYCF) and management of at-risk mothers and infants under six months (MAMI) in *Kule* and *Tierkidi* refugee camps in Gambella since 2014. As part of these support services, counselling on infant feeding is provided to mothers or caregivers. Currently, MIYCF counselling services are mainly didactic and include group education sessions

using counselling cards while the MAMI service is focused on one-on-one counselling, predominantly using MAMI counselling cards.

The use of educational videos is emerging as an effective mode of health education (Tuong, Larsen & Armstrong, 2014). Studies from Uganda, Rwanda and Malaysia have shown that educational videos are effective in improving knowledge and practices around breastfeeding (Monoto & Alwi, 2018; Mukarubayiza & Gowan, 2019; Mutanda, Waiswa & Namutamba, 2016). Thus, to address the barriers faced by breastfeeding women during the first six months of a child's life, GOAL has started using breastfeeding educational videos within its MIYCF and MAMI programme. To pilot the approach, GOAL translated eight Global Health Media Project (GHMP)¹ breastfeeding educational videos to Nuer language, the local language of the South Sudanese refugees in *Kule* and *Tierkidi* camps. To document the learnings, this study was designed to assess the changes in maternal breastfeeding knowledge and practice and to determine the feasibility (acceptability and utility) of the videos.

¹ <https://globalhealthmedia.org/>

Methods

Design and setting

We used an adequacy design with pre (baseline) and post (endline) assessments. From August to December 2020, GOAL piloted the GHMP breastfeeding educational video intervention in all four refugee camp sites – Kule 1, Kule 2, Tierkidi 1 and Tierkidi 2, Gambella, Ethiopia (Figure 1).

Study population and intervention delivery

The study population included mothers of infants under six months. At pre assessment, i.e., baseline, mothers with infants under four months residing in Kule and Tierkidi refugee camps who attended the MIYCF and/or MAMI programme and received breastfeeding counselling (based on MAMI and UNICEF IYCF counselling cards) were invited to participate in the study. Mothers were shown breastfeeding videos over a period of two months (eight weeks) (ENN et al., 2018; UNICEF, 2012). Thereafter, the same mothers were followed up for post assessment.

Using a multimedia platform (tablet), a total of eight videos of average length of seven to eight minutes were shown on a one-to-one basis. Subjects of the videos included i) attaching your baby at the breast, ii) positions for breastfeeding, iii) is your baby getting enough milk? iv) increasing

your milk supply, v) how to express breastmilk, vi) storing breastmilk safely, vii) what to do about nipple pain, and viii) what to do about breast pain. Based on the mothers' breastfeeding challenges or preference, counsellors decided on the sequence of the videos (most pertinent followed by others) and, if needed, the videos were repeated as required. Each participant was shown at least two videos at one contact point (weekly visit at MAMI/MIYCF programme clinic) and, over a period of eight weeks, the participants were shown all eight videos, repeated at least twice. Exposure to the intervention for participants was also recorded.

Sample size and data collection

Sample size was determined to assess the effect of the intervention over time using a comparison of paired proportions. We considered the following assumptions: 2% success-failure proportion, 45% failure-success proportion, 5% level of significance, 80% power and 20% non-response rate. We estimated that a total sample size of 96 (24 per camp site) was sufficient to compare paired proportions from baseline to endline. Data was collected at two time points – pre (baseline) and post (endline) assessments between August and December 2020. We used both quantitative and qualitative tools. A semi-structured tool, adapted from the WHO indicators for assessing IYCF practices (measurements), with questions on participant character-

istics, breastfeeding knowledge and practices was administered to mothers at baseline and endline (WHO, 2010). Additionally, we also conducted focus group discussions (FGDs) with mothers (two FGDs/site, total eight) and key informant interviews (KIIs) with health workers – MIYCF/MAMI counsellors (two staff/site, total eight) at endline. Topics included in the FGD/KII guides are shown in Box 1.

The health workers (counsellors, Diploma in General Nursing and Midwifery (DGNM)) interviewed the mothers while the research staff (Master of Public Health) conducted FGDs with the mothers and KIIs with the health workers. All data was collected using pen and paper.

Intervention delivery and data collection adaptation in the context of COVID-19

The tablets used for showing videos were sanitised with disinfectant after each use. For interviews, a minimum distance of one metre was maintained between the data collector and study participant. For FGDs, a maximum number of five participants was decided and the discussions were conducted in an open space, maintaining at least one metre distance between individuals (Figure 2).

Data analysis and presentation

Data was first entered and cleaned in Microsoft Excel spreadsheets (pre-post sheet, FGD sheet and KII sheet). The sheet with pre-post data was imported in STATA and this data was analysed to calculate frequencies of participant characteristics and changes in proportions of breastfeeding knowledge and practice outcomes.

Five primary outcomes were defined: i) exclusive breastfeeding, ii) bottle feeding, iii) cup feeding, iv) knowledge of early initiation and v) knowledge of complementary feeding. Three secondary outcomes were also defined related to knowledge about: i) advantages of early initiation of breastfeeding (EIBF) (1: healthy start to the baby, 2: skin-to-skin contact, 3: colostrum, 4: suckling will speed up contraction of uterus and delivery of placenta and 5: help bond with the baby), ii) attachment and positions (1: hold baby close, towards mother, 2: head and body inline/straight, 3: nipple opposite nose, 4: fingers away from nipple, 5: mouth wide open, 6: chin against breast and 7: lip turned out) and iii) signs that baby is hungry (1: moving lips/tongue, 2: hand to mouth, 3: opening mouth; 4: turning head side to side and 5: crying/irritable/restless). Qualitative data was coded in Excel and themes identified. Results are presented according to themes.

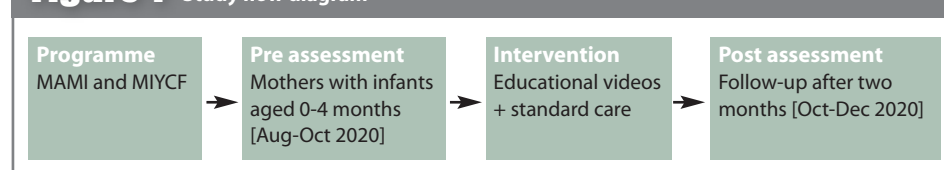
Ethical considerations

We followed the 'ethical standards for research during public health emergencies' guidelines by WHO (WHO, 2020). We ensured that the research work did not impede the emergency response efforts and all participants were treated with equal respect. All data was collected after obtaining informed consent from the participants.

Results

Of the 96 participants, three did not complete the study (moved to host community) and hence

Figure 1 Study flow diagram



Box 1 Topics for FGD/KII guides

- What do you think of the breastfeeding videos?
- What have you learnt from these videos/how do you find them as an educational tool?
- What do you like about the videos/what do you like about using the videos?
- Anything you did not like about the videos?
- How did you find this new method of IYCF support compared to how you were being supported before (mothers)/how did you find this new method of IYCF support compared to how you were upporting before (health workers)?
- After watching the videos, have you made any changes in the way you breastfeed the child (mothers)/after showing the videos, have you observed any changes in the mothers' breastfeeding knowledge and practices (health workers)?
- What other support do you think would help you to maintain good breastfeeding practice (mothers)/what other support do you think would help you to provide adequate IYCF services (health workers)?
- Who influences feeding practices for babies and young children at home or in your community?
- Is there anyone else you think should be watching these videos in your community?

Figure 2 Data collection adaptations to prevent COVID-19 infection



Left, FGD and right, KII

Table 1 Characteristics of study population at baseline

Characteristics	Frequency	Percentage
Nutrition Programme		
MAMI	22	23.7
IYCF	71	76.3
Infant sex		
Male	40	43.0
Female	53	57.0
Parity		
Primiparous	26	28.0
Multiparous	67	72.0
Infant age (months)		
<1	24	25.8
1	39	41.9
2	16	17.2
3	12	12.9
4	2	2.2
Practiced ever breastfeeding		
Yes	93	100.0
Practiced EIBF		
Immediately after birth	72	77.4
<1 hour	14	15.1
1-24 hour	6	6.5
Do not know	1	1.1
Experienced breast pain while breastfeeding		
Yes	21	22.6
No	72	77.4
Experienced nipple pain while breastfeeding		
Yes	38	40.9
No	55	59.1
Worried infant not getting enough breastmilk		
Yes	21	22.6
No	72	77.4
Practiced expressing breastmilk		
Yes	21	22.6
No	71	76.3
Do not know	1	1.1
Practiced storing breastmilk		
Yes	21	22.6
No	71	76.3
Do not know	1	1.1

the final analysis is based on 93 participants. Characteristics of participants at baseline are presented in Table 1. More than three-quarters of the mothers were attending the MIYCF programme. The majority (67.7%) had infants ≤ 1 month of age. All mothers practiced breastfeeding and the vast majority (92.5%) also practiced EIBF (immediately after birth to less than an hour). Just under a quarter of mothers practiced expressing and storing breastmilk and 22.6% of mothers were worried about their infant not getting enough milk. The proportion of mothers who experienced nipple pain specifically was 40.9% while 22.6% reported more generalised breast pain.

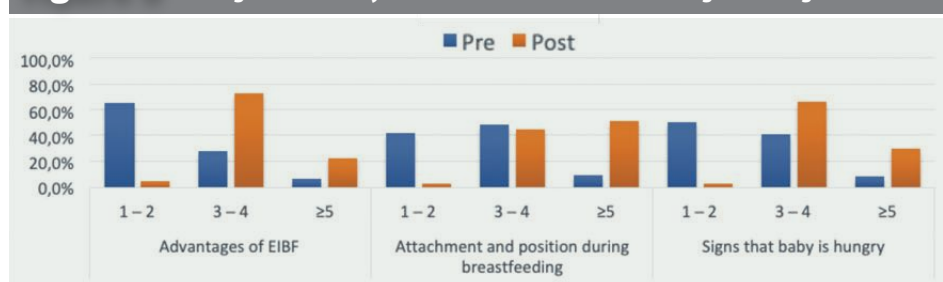
Effect of videos on maternal breastfeeding knowledge and practices

Each mother watched the eight videos at least twice. After watching the videos, analysis of the

Table 2 Change in primary outcomes related to knowledge and practice

Knowledge and practice	Pre (%)	Post (%)	Difference (%)	P value*
Practised exclusive breastfeeding	100	98.9	1.1	0.31
Practiced bottle feeding [†]	3.2	4.3	1.1	0.70
Practiced cup feeding [†]	3.2	1.1	2.1	0.31
Correct knowledge about EIBF [‡]	95.7	96.8	1.1	0.65
Correct knowledge about introduction to complementary feeding [§]	89.1	97.8	8.7	0.02

[†]used to feed expressed milk, [‡]Mothers who understood breastfeeding should be initiated immediately or within an hour of birth, [§]Mothers who understood the correct timing of introduction of complementary feeding at six months, *McNemar's test

Figure 3 Change in secondary outcomes related to breastfeeding knowledge

Numbers on x axis represent number of knowledge items

primary outcomes demonstrated a statistically significant difference in the knowledge about introduction to complementary feeding – increased by 8.7 percentage points (Table 2). However, no significant differences were observed in other primary breastfeeding practice and knowledge outcomes. It is important to note that, at baseline, all mothers were already practicing EBF and only a small proportion were practicing bottle or cup feeding using expressed breastmilk. Similarly, the vast majority of mothers at baseline already had correct knowledge about EIBF.

Figure 3 presents the changes in secondary outcomes related to mothers' breastfeeding knowledge. Unlike the primary outcomes, these illustrate a substantial change in knowledge. Overall, there was an improvement in knowledge about the advantages of EIBF, attachment and positions during breastfeeding and signs to identify that baby is hungry. Before watching the videos, most mothers only knew about 'a healthy start to the baby' and 'colostrum' as advantages of EIBF. However, after watching the videos, they also knew about 'skin-to-skin contact' and 'bonding with the baby'. Similarly, regarding attachment and positions, most mothers only knew about 'holding baby close' and 'mouth wide open' while, after watching the videos, they also knew about 'head and body in line/straight'. Mothers' knowledge about identifying signs that baby is hungry also improved – initially they could only identify 'moving tongue/lips' and 'crying/irritable/restless'. After exposure to the intervention, they were also looking for signs such as 'opening mouth' and the baby putting 'hand to mouth'.

Feasibility of the videos

Five themes emerged from the qualitative findings: utility, appropriateness, acceptability, effectiveness, challenges and suggestions.

Utility

All mothers found the videos useful. Health workers also found them useful – they mentioned that mothers like watching the videos. One of the health workers highlighted that using only counselling it is difficult to demonstrate ["we don't demonstrate everything because it's hard to show our private body parts"]. Another health worker mentioned it could reduce their workload ["The counselling used to take us around 40 minutes. Now we can undertake other activities while they are watching the video"].

Appropriateness

Mothers stated they learnt about attachment and positioning, expressing and storing breastmilk, managing breast pain and identifying signs of baby getting enough milk. Health workers said they liked the length and pace of the videos. They also highlighted that the videos are comprehensive and self-explanatory and appreciated the local language translation.

Acceptability

When asked about likes or dislikes, both mothers and health workers said there was nothing that they did not like about the videos. Mothers shared various examples of what they liked about the videos such as – they can practice while watching the videos, they liked how real the videos are ["I came from rural area in South Sudan I did not know breastfeeding had to follow a certain way. The video elaborates that one by one. The mothers do not get humiliated when they show their breast, I like how real the videos are"], appreciated the videos are in their local language ["I like how it was done in our language"] and found them easy to follow and remember ["the videos are not playing fast, so, we can attentively follow"]. Similar to the mothers' responses, health workers also mentioned that mothers can practice side by side

while watching. One of the health workers said “The videos give time for the mothers to practice while watching the video. The mothers can follow the flow of the video and practice side by side. And the animators are humans which make the videos more acceptable”.

Effectiveness

Comparing the digital version of IYCF support with standard counselling support, mothers mentioned the advantages of the videos over standard support. Mothers said the videos were comprehensive and the practices are demonstrated while with standard counselling they only received messages thus must translate these into practical actions. They also highlighted that, when they watch the videos, it is easier to remember messages while with standard counselling they sometimes forget. On the other side of the fence, health workers said that convincing mothers to participate in counselling requires effort. However, with videos, they are happy to focus on behaviour change. One of the health workers said – “counselling takes more time and sometimes beneficiaries get bored, however, with videos they are happy to learn”. Mothers said after watching the videos, they had started practicing expressing and storing breastmilk, observing signs that baby is getting enough milk and observing attachment to nipple. Health workers confirmed these changes in practices. The most commonly cited reasons for practising expressing and storing breastmilk were mothers’ other household responsibilities, such as going to market and fetching firewood. One of the mothers said – “I learnt how to express the milk from my breast. This is a new thing. We have so many responsibilities as a woman. Knowing this method has helped me reducing my burden”.

Challenges

Acceptance of expressing and storing breastmilk was found to be a challenge by the community. Some mothers said their family members do not support them as they find these practices to be against their culture and religion. Mothers said that elderly people in the family influence their feeding practices; a mother shared, “the influence is high from our fathers and mothers. They want to raise our children the way we grew up. They refuse us to practice some of the practices we learn here. For example: removing the milk from the breast is not accepted well by the community”.

Suggestions

Mothers suggested these videos should also be shown to young girls, pregnant women and one additional caregiver (husband). Mothers mentioned similar videos can be prepared for pregnant women while health workers suggested continuing such videos beyond the first six months of life. Other suggestions included a request for increasing the frequency and a bigger screen for watching the videos.

Discussion

This study found that the majority of the mothers were already practicing exclusive breastfeeding before exposure to the intervention, however, their knowledge about the various advantages of early initiation of breastfeeding, attachment and positioning, and identifying signs that baby is hungry was limited. Post exposure, after watching the videos, exclusive breastfeeding was sustained and there were considerable improvements in more detailed breastfeeding knowledge. Both mothers and health workers found the videos acceptable, useful and effective. Other benefits recorded were improved ability of the videos to convey ideas and physically demonstrate specific practices that not usually achieved through didactic counselling, allowing mothers to trial various practices whilst being shown them, improving engagement and memory retention by mothers/carers and providing a marked reduction in workload for health workers.

Although EIBF and EBF are two core IYCF indicators and are most commonly measured to assess the IYCF practices for infants under six months, other qualitative indicators, such as attachment and positioning, are also important. Effective breastfeeding is a function of both the correct positioning of mother and baby and the correct attachment of the child to the mother's breast. It is essential to support early growth and development as it is associated with long-term health.

The GHMP breastfeeding videos have also been tested in other settings. A study from Malaysia found these videos to be a suitable educational and training tool in helping breastfeeding mothers (Monoto & Alwi, 2018). Another study from Rwanda found the GHMP videos were effective in improving parental knowledge in caring for their pre-term infant (Mukarubayiza & Gowan, 2019). Other studies have also found that video-assisted counselling is effective in sus-

taining healthcare behaviors (Kellams et al., 2016; Aditya, Tiwari & Mishra, 2020). Baseline EBF rates were not assessed in these studies however.

Due to the COVID-19 pandemic, we used an adequacy evaluation design with longitudinal data collection. As there was no control group, it may be difficult to infer any observed changes were due to the intervention and that these changes would not have happened anyway. The observed changes may have been caused by other factors such as women can become more knowledgeable about breastfeeding as they continue their breastfeeding journey – i.e., as their infant grows and they overcome various challenges.

The data we collected was brief and investigations were not as detailed as would have been planned under normal circumstances. To save health workers’ time, who were overburdened, we only collected post-assessment information on selected indicators. The FGDs and KIIs were also minimised to be completed under 20-30 minutes and 10-15 minutes, respectively. The study results should be interpreted in line with these limitations. Since our study population at baseline was already practicing EBF, it would be interesting to conduct a similar study in a population where breastfeeding practices are not as optimal at baseline and compare the results.

We plan to implement this video-assisted counselling in both MIYCF and MAMI programmes in Gambella, Ethiopia. However, as suggested by mothers and health workers, we would consider increasing the frequency and introducing bigger screens – displaying videos on a television so that the mothers can watch them together, practice side by side and discuss with or support each other. Through video-assisted counselling, we would also be addressing the challenges faced by the mothers due to local traditions, elaborating on when these practices can be used to maximise positive outcomes for the infant. In addition to displaying breastfeeding videos on bigger screens as part of clinic-based counselling services, we also plan for the community health workers to use tablets to show the videos to family members or key influencers to address any challenges faced by the mothers due to cultural or religious belief.

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A systematic review of nutrition interventions for mobile pastoralists

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GLOBAL

What we know: Pastoralist communities are vulnerable to seasonally-driven and shock-related high rates of acute malnutrition.

What this article adds: A systematic review was undertaken of studies describing interventions within mobile pastoralist communities to improve child nutrition status. A total of 16 studies were included, drawn from a previous systematic review of health interventions in pastoralist communities and previous Emergency Nutrition Network Field Exchange articles. The results reveal that low levels of education, poverty, poor infant and young child feeding practices and poor health-seeking and hygiene practices are key determinants of child malnutrition in mobile pastoralist communities. Food security is also a contributing factor, especially during drought and conflict, and pastoralists who settle, particularly in regions unsuitable for agronomist lifestyles, have a greater risk of food insecurity. During stable periods, however, there is evidence that children in mobile pastoralist communities can access quality diets. Evidence from intervention studies shows that targeting livestock health can add nutritive value and stability to the milk supply chain, food aid during periods of shock can reduce the levels of child wasting and anaemia and culturally-targeted, community-directed nutrition education may improve child nutrition. More research in this area is needed across a range of contexts.

Introduction

Pastoralists, defined as populations that practise animal husbandry as their primary economic activity and typically practise some degree of seasonal mobility, inhabit some of the harshest, most remote terrain on earth. These communities migrate with herds of livestock to follow seasonal grazing grounds and water sources. Often not included in routine demographic surveys, their numbers are unknown, however estimates range from 50 to over 300 million individuals globally. The African Union estimates there are 268 million pastoralists on the African continent

alone (Carr-Hill, 2013). Children who live in pastoralist areas are increasingly regarded as some of the most nutritionally vulnerable in the world. Nutrition surveys in Eastern Ethiopia and other pastoralist areas of Africa have long identified seasonally high rates of acute malnutrition (Chotard et al, 2010). Pastoralist populations are vulnerable to shocks that result in nutrition risks such as drought, animal disease, market disruption and the closure of borders and many pastoralists' nomadic livelihoods prevent them from accessing health services designed for sedentary populations. Understanding how

best to reach and improve nutrition in children among mobile pastoralist communities is an important global health priority.

A recent systematic review of health interventions among mobile pastoralists found 140 studies, seven of which included child nutrition outcomes (Wild et al, 2020). Their description of the results focuses largely on the facilitators and barriers to intervention success and, since they include all health interventions, the mention of nutritional interventions is very limited. Given the high rates of malnutrition among children in this community and the limited knowledge synthesis on this topic, in this report we revisit the seven nutrition intervention studies found that search and summarise these alongside a review of all the articles on this topic that have been published in Emergency Nutrition Network (ENN)'s Field Exchange. The purpose of this review was to answer the questions – what types of interventions have been described and what aspects of these interventions have succeeded or failed in improving the nutritional status of children living in mobile pastoralist communities?

Methodology

We reviewed and described the seven studies identified by a recent search of PubMed/MEDLINE, Scopus, Embase, the Cumulative Index to Nursing and Allied Health Literature (CINAL), Web of Science, the World Health Organization (WHO) Catalog, Agricultural Online Access (AGRICOLA), the Centre for Agriculture and Bioscience International (CABI), the Scientific Electronic Library Online (SciELO) as well as Google Scholar and structured Google searches to query grey literature such as humanitarian

Table 1 Summary of papers included

Author and year	Country	Population	Objectives	Study design	Findings
Peer reviewed publications					
(Chege et al, 2015)	Kenya	60 mothers of Maasai children <5 years	To investigate the influence of culture on dietary practices among Maasai children	Qualitative focus groups (descriptive)	Nomadism results in animal products being inaccessible to most children since men are away with animals. Animals are rarely slaughtered or sold. Children mainly consume cereals and legumes. (descriptive) (descriptive)
(Gizaw et al, 2016)	Ethiopia	367 children <2 years in a nomadic population	To assess the prevalence of diarrhoea and its association with feeding practices	Cross-sectional survey (descriptive)	Prevalence of diarrhoea was high at 31%. It was associated with sub-optimal breastfeeding practices and eating uncooked foods.
(Vossen et al, 2017)	Kenya	882 breastfed children aged <23 months	To formulate age- and context-specific complementary feeding recommendations, based on current diets and assess barriers to uptake of recommendations.	Combination of nutrient gap analysis and ethnographic techniques (descriptive)	Optimising current diets to improve complementary feeding could ensure adequate levels of most nutrients among settled and pastoralist infants/children, but less so among agro-pastoralist communities where use of nutrient-dense foods was limited.
(Seid et al, 2017)	Ethiopia	420 children aged 6-59 months with their caregivers	To assess the determinants of acute malnutrition	Facility-based, unmatched case control study (descriptive)	Rural residence, illiterate father, monthly income of less than 1000 birr and food served together with family were statistically associated with acute malnutrition.
(Le Port et al, 2017)	Senegal	204 children age 2-5 years	To assess whether a dairy value chain could be used to distribute a micronutrient-fortified yoghurt to improve haemoglobin (Hb) and reduce anaemia	Cluster randomised controlled trial (RCT) (intervention)	Anaemia prevalence was very high at baseline (80%) and dropped to 60% at endline with no differences between study groups. Hb increased by 0.55 g/dL, (95%CI 0.27 0.84) more in the intervention compared to the control group after one year.
(Bernard et al, 2019)	Senegal	320 household groups	To reduce variability in milk deliveries and improve children's nutritional status by providing fortified yogurt to milk suppliers	RCT (intervention)	This intervention increased the regularity of milk deliveries and may have improved child Hb status.
(Salehi et al, 2004)	Iran	811 families with children aged <5 years	To assess the impact of a community-based education intervention on child growth	RCT (intervention)	After 12 months, intervention, children had significantly greater gains in weight-for-age (WAZ), height-for-age (HAZ) and weight-for-length (WLZ) than controls.
(Stefanak and Jarjoura, 1989)	Chad	641 malnourished children (WLZ<80% median) <5 years	To assess the impact of centre-based vs take-home supplementary feeding on child weight gain	Unmatched case control study (intervention)	Children receiving supplementary food in a two-week take-home programme had similar weight gain to those enrolled in a supervised daily rehabilitative feeding programme.
(Bush, 1995)	Kenya	1,000 households in drought-affected Turkana district	To evaluate the role of food assistance in the context of long-term drought	Cross sectional surveys and qualitative case studies (intervention)	There was a decline in rates of childhood malnutrition as a result of food assistance.
Other literature					
(CDC, 2002)	Mongolia	937 children 6-59 months	To assess the nutritional effects of severe winters on pastoralist children	Cross-sectional survey (descriptive)	There was no difference in nutritional status (wasting, stunting underweight) between affected and unaffected areas. Wasting was approx. 2% and stunting 30%
(Sadler and Catley, 2010)	Ethiopia	40 men and women sampled from two areas of the Somali region	To examine pastoralists' views on the causes of child malnutrition, links between child nutritional status and milk supply and interventions for addressing malnutrition	Qualitative participatory focus groups (descriptive)	Milk contributes the majority of children's diets when it is available. During the dry season and during periods of drought, milk is not available and this is perceived to be directly associated with child weight loss.
(Mayer et al, 2009)	Mali	Representative sample of whole population of 30,000 people	To field test a novel survey method, better designed to assess prevalence of malnutrition among pastoralist children	Novel prevalence survey (descriptive)	The method is practical for use in pastoral populations it is valid and is simple to apply. The method used local knowledge to sample whole 'troupes' (groups of pastoralists who move together). There are significant differences in wasting prevalence when using MUAC vs WLZ in this community.
(Reese-Masterson et al, 2016)	Kenya	227 children aged 6-23 months	To investigate the socio-economic and health-related risk factors associated with stunting, wasting and both combined	Secondary data analysis of survey data (descriptive)	Stunting prevalence was 28%, wasting by WLZ 8.8% and MUAC<11.5cm 1.3%. Hand-washing, fever and older age were associated with stunting. Not owning livestock was associated with concurrent wasting and stunting.
(Buchanan-Smith and Barton, 1999)	Kenya	All households in the affected district malnutrition assessed in children < 5 years	To evaluate the Oxfam Wajir Relief Programme 1996-98	Project evaluation report	Rates of malnutrition decreased during the provision of food aid and supplementary feeding.
(Sadler and Mitchard, 2012)	Ethiopia	940 children 6-59 months	To evaluate the impact of livestock support on child nutritional status during the dry season	Case control study (intervention)	Targeted livestock support to milking animals that stay close to women and children during the dry season increases milk production and consumption among children and improves nutritional status.

Cont'd next page

Author and year	Country	Population	Objectives	Study design	Findings
Other literature					
(Sesay et al, 2018)	Somalia	Community members from three livelihood groups: pastoralists, agro-pastoralists and urban populations	To determine the viability of a livestock intervention and identify areas to improve the nutritional status of children 6-23 months	Feasibility study (cross-sectional survey and qualitative methods) (intervention)	Interventions should aim to enhance milk production and processing during the wet season and should focus on improving milk handling, production and preservation. Behaviour change related to IYCF should also be implemented.

*Abbreviations: IYCF=infant and young child feeding; RCT= randomised controlled trial. WLZ=weight for length z-score; WAZ= weight for age z-score; HAZ= height for age z-score; MUAC= mid-upper arm circumference

agency reports (i.e., the International Organization for Migration (IOM), the United Nations High Commission for Refugees (UNHCR) and Medecins Sans Frontieres (MSF)).

Additionally, we searched the Field Exchange database to identify any further studies not already captured. We used similar search terms to those used in the above review, including 'pastoralis*' OR 'nomad*' AND 'malnutrition' or 'nutrition'. Inclusion criteria was any descriptive or interventional child nutrition research targeted at nomadic or semi-nomadic pastoralist populations.

Results

Seven studies already identified by Wild et al (2020) were included. Our search of the Field Exchange database identified 213 titles and abstracts of which 10 full texts were reviewed with six reports ultimately included. Two of these studies were interventions and four were descriptive. We excluded three studies targeting sedentarised pastoralist populations only. We identified one study that was a systematic literature review of food assistance for pastoralist populations and we used the reference list of that review to identify a further three studies with child nutrition outcomes (Czuba et al, 2017). In total, we included 16 papers in this review, details of which are summarised in Table 1.

Descriptive studies

Descriptive studies of pastoralist communities have found child malnutrition rates to be high, especially in the lowest income families and those with illiterate parents (Reese-Masterson et al, 2016; Seid et al, 2017). The difference in 7natural body proportions of many pastoralist populations means that estimates of wasting prevalence differ significantly when using weight-for-length/height z-score (WLZ/WHZ) versus mid-upper arm circumference (MUAC); which method to use and how to address this is an ongoing challenge.

Poor infant and young child feeding (IYCF), health-seeking and hygiene practices are common among pastoralists with high rates of child undernutrition (Sesay et al, 2018). The nomadic lifestyle and the temporary nature of many settlements mean that many families do not have access to health, education and sanitation services. This is likely to contribute to high rates of diarrhoeal disease which leads to and exacerbates undernutrition (Gizaw et al, 2016). A study of water hygiene practices in communities with large concentrations of cattle also found that child malnutrition rates were lower in families that cleaned their water containers or did not share their water source with livestock (Marshak

et al, 2017). Misinformation and cultural beliefs detrimental to nutrition are common among pastoralist communities, such as the early introduction of herbal teas before the age of six months and the consumption of raw meat and blood which has infection risks (Chege et al, 2015).

Positive nutritional cultural beliefs in this population include the perceived benefit of animal milk for young children; when fresh milk is available, it is frequently given to children and added to complementary foods (Sadler & Catley, 2010). While milk from animals is a major part of children's diets when the animals are accessible and productive, the animals are often not accessible to women and children as they are away with the men seeking pasture (Chege et al, 2015). In a normal year, the dry season can result in a 70% reduction in children's consumption of milk and, in a drought year, children's milk consumption can drop to negligible amounts (Sadler & Catley, 2010). One study suggests that, during a normal year, pastoralist communities have access to adequate diets that could be optimised for adequate complementary feeding with improved diet knowledge by caregivers (Vossenaar et al, 2017). However, agro-pastoralists (pastoralists who have largely settled and practice crop production) had more limited access to diverse diets and sedentarisation can lead to further impoverishment and malnutrition as the context is often too unpredictable for crop production and the families are inexperienced in this way of life (Vossenaar et al, 2017). The decreased mobility of pastoralists globally has been caused by climate change, political instability and programmes that encourage settled status (Bush, 1995).

Interventions

Education interventions, food assistance, the provision of fortified yogurts as part of the milk value chain and livestock support have all been effective in improving children's diets and nutritional status. These successful interventions were all highly tailored to their context, based on discussions with communities and aimed to support the communities' semi-nomadic way of life and optimise child survival in these arid contexts. For example, in Iran, a successful education and behaviour change intervention aimed at tackling harmful cultural beliefs such as the discarding of colostrum and the delayed introduction of complementary feeding was implemented by building on positive cultural beliefs and utilising known community influencers (Salehi et al, 2004). The intervention was embedded within existing mobile schools formed

by community elders that educated children during periods of migration. This resulted in greater uptake of messages compared to when messages were conveyed by 'outsiders' and led to greater consumption of eggs, legumes and vegetables in children in the intervention group.

Animal milk is a nutrient dense food and has long been recognised as an important component of pastoralist diets across the world. Interventions that can increase milk production, sustain milk production through the dry season and include milk consumption alongside the promotion of optimal IYCF practices are likely to positively impact child nutrition. While many livestock interventions have taken place in these communities, we only found four examples that demonstrated a positive impact on child nutrition (Sadler, 2012; Sesay, 2018; Le Port, 2017; Bernard, 2019). A feasibility study found that the timing of these interventions is important. To maximise impact, interventions should focus on enhancing milk production, processing and consumption during the season when milk is most scarce (Sesay et al, 2018). There is also a need to build the capacity of communities in milk handling and preservation. An intervention that gave milking animals a daily ration of supplementary feed plus a package of vaccinations and deworming medications during the four months of the dry season resulted in significantly increased milk consumption among young children and had positive implications for nutritional status (Sadler & Mitchard, 2012). While a study in this review found that biweekly outpatient visits were effective at treating children with severe wasting (Stefanak & Jarjoura, 1989), a preventative intervention such as livestock support is likely to be more cost-effective and reduce the risk of severe wasting happening in the first place.

Besides livestock support, two other studies improved children's milk product consumption and nutritional status through a milk value chain incentive intervention (Le Port et al, 2017; Bernard et al, 2019). Farmers were offered fortified yoghurt for their children when they came to sell their milk to a processing factory during both the wet and dry seasons despite the milk production level falling in the dry season. The yoghurt was fortified with iron due to high rates of anaemia in the region. Additionally, the practice of milk fermentation improves the bioavailability of micronutrients in milk and improves food safety. This public-private partnership also had the benefit of improving the regularity of milk deliveries to the factory,

making the business viable which, in turn, could improve investment and employment in the area (Le Port et al, 2017; Bernard et al, 2019).

Contexts with nomadic pastoralist communities are vulnerable to shocks as well as the impact of seasonality, often as a result of warming climates, irregular rainfalls and political insecurity. During crises, food aid interventions have frequently been used to protect children from severe wasting. The effectiveness of food aid interventions has been evaluated by a number of studies including a systematic review in 2017 (Czuba et al, 2017) which included three studies that focused on child nutrition outcomes (Buchanan-Smith & Barton, 1999; Bush, 1995; CDC, 2002). These studies all argue that the rates of malnutrition in children decreased because of access to food assistance. For example, following the loss of many livestock due to drought in Wajir district in Kenya, a food relief programme was set up that provided 80% of households' caloric requirements. This saw acute malnutrition rates fall from 25% to 9% in just four months (Buchanan-Smith & Barton, 1999). There was also a tangible drop in child mortality and other secondary benefits including a reduction in household debt and a reduction in the price of maize which allowed more families to purchase it. These economic benefits of food aid are often not assessed but are important for the sustainability of the intervention. For example, a generous ration of food relief following a drought in Turkana district in Kenya helped prevent further livestock depletion and enabled cash generation through the selling of surplus food (Bush, 1995). This evidence suggests that, despite the notion that food aid is an unsustainable intervention, it can have longer term benefits for child nutrition when used during periods of drought.



Pastoral Community Development Programme – Human and Animal Health Post

Conclusion

In conclusion, there is evidence from descriptive studies that low levels of education, poverty, poor IYCF practices and poor health-seeking and hygiene practices are important determinants of child malnutrition in mobile pastoralist communities. While studies show that food insecurity is a significant contributing factor to child malnutrition, especially during times of drought and conflict, there is evidence from one study that, during stable periods, children of nomadic pastoralists can access quality diets. Pastoralists who have settled, often in regions that are unsuitable for an agronomist lifestyle, have greater food insecurity than nomadic pastoralists. While few interventions for improving child nutrition in pastoralist communities have

been assessed, those that have, have been successful. Interventions that target livestock health and add nutritive value and stability to the milk supply chain or that provide sufficient food aid during periods of shock have seen reductions in the levels of child wasting and anaemia. Given the identified risk factors, nutrition education interventions are also important for this community and those that provide culturally tailored and community-directed interventions show promise for improving child nutrition. More research into these interventions across a range of pastoralist contexts is needed, given the high rates of child malnutrition in these vulnerable communities.

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Asia and the Pacific Regional Overview of Food Security and Nutrition

Report summary¹

The third annual Food Security and Nutrition report, jointly written by the Food and Agriculture Organization, the World Health Organization, UNICEF and the World Food Programme explores the progress of countries in the Asia and Pacific region towards the Sustainable Development Goals (SDG) and World Health Assembly (WHA) targets on nutrition. Split into two parts, the report firstly tracks progress on key SDG targets up to 2019 and explores some scenarios which highlight the potential impact of the COVID-19 pandemic. The second part of the report focuses on potential solutions to improve the diets of mothers and children in the Asia and Pacific Region as well as noting some of the challenges. The report aims to raise awareness of the importance of maternal and child diets as well as to support conversations around shaping policies and practices across the region in order to achieve food security and nutrition for all.

Five years on from the launch of the SDGs, the report reveals that, overall, the region is not on track to achieve the 2030 targets. In 2019, 350.6 million people in the region were estimated to be undernourished, more than half of the global total. An estimated 74.5 million children under five years of age were estimated to be stunted and a total of 31.5 million children under five years of age in the region were classified as wasted. The prevalence of overweight and obesity is also growing.

While the true impact of COVID-19 on food security and nutrition is yet to be established, it is projected that these 2019 estimates will be driven even higher as a result of the pandemic. There is thus a clear need for governments and partners to intensify commitments to implement evidence-based policy and programmes to accelerate progress towards the SDGs as well as building resilience against future disasters and epidemics.

Since the causes of undernutrition are multifaceted and broad-ranging, the cost of a healthy diet is a critical factor to ensure food security and nutrition for all. In the region, 1.9 billion people are unable to afford a healthy diet; therefore, integrated policies and approaches to address food affordability, availability and accessibility are needed.

Globally, there is consensus that to address these issues, an integrated and coordinated systems approach is needed, involving institutions and actors across the water and sanitation, health, social protection and education systems. Social behaviour change communication needs to be mainstreamed throughout these systems for greater uptake and sustainability of healthy behaviours and diets. Strong political will, commitment and leadership are needed to mobilise stakeholders in a multi-sector approach. To make the most efficient use of scarce resources, it is important to invest in the most cost-effective and impactful interventions to improve maternal and child diets. With only 10 years left to achieve the 2030 agenda, a combination of these efforts is needed to support the active promotion of maternal and child diets.

¹ <https://www.unicef.org/rosa/media/12181/file/Asia%20and%20the%20Pacific%20Regional%20Overview%20of%20Food%20Security%20and%20Nutrition.pdf>

The effects of food systems interventions on food security and nutrition outcomes in low- and middle-income countries

Report summary¹

There is a significant global focus on improving food systems to address malnutrition and food insecurity in low- and middle-income countries (LMICs). However, the complicated and disorganised nature of the evidence base makes navigating it a challenge for policy makers, donors and practitioners. To address this, the International Initiative for Impact Evaluation (3ie), with support from Innovative Methods and Metrics for Agriculture and Nutrition Actions, was commissioned by Deutsche Gesellschaft für Internationale Zusammenarbeit to develop an evidence gap map (EGM) on the literature relating to food systems interventions to food security and nutrition outcomes in LMICs.

An interdisciplinary approach was used to identify a total of 178 systematic reviews and 1,838 impact evaluations. The majority of the impact evaluations were conducted in sub-Saharan Africa (33%), South Asia (20%) and East Asia and the Pacific (17%) with over half focusing on rural areas. The most common interventions had

over 100 impact evaluations each and at least 20 systematic reviews. These predominantly focused on direct food provision or targeted consumer behaviours by providing supplements, fortification, classes, peer support and counselling.

The literature predominantly focused on randomised trials (approximately three quarters of all impact evaluations) at local and sub-national levels. Mixed methods approaches were less commonly used and interventions at national and transnational levels were lacking, despite their wide reach. There was also a lack of qualitative data to inform the context-specific impacts of interventions. Few studies conducted cost analyses which are important in understanding how to best allocate resources. Several interventions were under researched, with no impact evaluations identified for advertising regulations, food waste education programmes or food packaging. While women play a major role within food systems, limited evidence was available for interventions to support their decision-making and for those that measured outcomes related to their empow-

erment. The majority of studies examined either final or intermediate outcomes with only one fifth exploring outcomes along the causal chain.

While this EGM was primarily developed as a tool to identify relevant literature, it also provided some useful recommendations for future research to fill the identified evidence gaps. For example, for widely implemented interventions, such as those related to labelling and advertising regulations and governmental price manipulations, evaluations are needed to explore their potential for negative consequences and ensure the efficient use of funds. More research into the effects of interventions on different populations should also be explored. Furthermore, qualitative research or impact evaluations that examine the intermediate steps in the theory of change, together with the final intervention outcomes, are needed to develop more effective interventions.

¹ <https://www.3ieimpact.org/sites/default/files/2021-01/Food-system-EGM-brief.pdf>

Simplified approaches for the treatment of child wasting: A rapid evidence review

Report summary¹

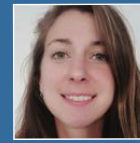
By Emilie Buttarelli, Grace Funnell and Sophie Woodhead



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GLOBAL

What we know: Simplified approaches for the treatment of child wasting are increasingly being implemented in countries to improve the coverage and cost-effectiveness of treatment services.

What this article adds: The effectiveness of 36 projects testing simplified approaches in 21 countries was reviewed. Simplifications include the use of mid-upper arm circumference (MUAC) as the only admission criteria, the family MUAC approach, modified dosage of ready-to-use food, use of a single product for the treatment of both severe and moderate wasting, modification of admission criteria and delivery of wasting treatment by community health workers (CHWs). While the family-MUAC approach is implemented operationally, it has so far been less documented than other approaches. As a context-specific approach is promoted, the evidence is heterogeneous and includes gaps. The evidence on modified dosages shows that nutritional outcomes (recovery, non-response, defaulting, death) are usually non-inferior to the standard dosage although further research is needed. Nutritional outcomes for admissions based on MUAC-only and for the delivery of wasting treatment by CHWs are satisfactory when compared to standard treatment. The evidence is promising for some simplifications, implemented alone or in combination and when tailored to the specific context.

Objective

This rapid review aimed to provide an overview of the current evidence and practice on the treatment of child wasting using simplified approaches. Simplified approaches include a range of adaptations of treatment protocols and programmes for the community-based management of acute malnutrition (CMAM) that aim to improve coverage and cost-effectiveness. This review compiles the existing evidence, synthesising the variety of simplifications implemented to date, as well as treatment outcomes.

Methodology

The rapid review examined peer reviewed literature, grey literature (final reports, online publications) and other unpublished material (protocols, internal reports, webinars, briefs). The effectiveness of the simplified approaches was assessed using standard programme indicators.

Results

We reviewed a total of 63 resources: 19 protocols, 16 peer reviewed papers, 10 Emergency Nutrition Network (ENN) papers, five proposals, three trials, four reports, three documents on preliminary results/protocol, one information sheet, one terms of reference document and

one webinar presentation. Among these 63 resources, we identified 36 projects of which detail on precise simplifications existed in 33 (shown in Figure 1). The available evidence on simplified approaches covers 21 countries: 10 in West and Central Africa, six in Eastern and Southern Africa, four in South Asia and one in the Middle East and North Africa and a multi-country secondary analysis to design the ComPAS² dosage table. Action Against Hunger, ALIMA, the International Rescue Committee and UNICEF are the four organisations that have contributed the most to the available evidence on simplified approaches.

Using mid-upper arm circumference (MUAC) as the only admission criteria is the most frequently used simplification, followed by the use of a modified dosage of ready-to-use food, the use of a single product for treatment of both severe and moderate wasting and the modification of admission criteria. Some of the projects reviewed tested a combination of simplifications, such as the ComPAS and OptiMA³ trials which have brought together MUAC only admissions, modified dosage and the use of one product for treatment.

Recovery rates for projects including a modified dosage are usually non-inferior to standard

dosage. However, recovery rates tend to be less satisfactory for children admitted with MUAC under 115 mm (severe wasting) receiving either standard or modified dosages. Recovery rates for children admitted with a MUAC between 115 mm and 124 mm (moderate wasting) are always far higher than Sphere standards. Recovery rates for MUAC-only admissions are generally satisfactory when compared with Sphere standards. However, as noted when dosages are modified, recovery rates are generally lower for children admitted with MUAC <115 mm or oedema compared to those admitted with MUAC between 115 mm and 124 mm. Recovery rates for the delivery of wasting treatment by community health workers (CHWs) were found to be unanimously better when compared to standard treatment and defaulter rates were lower.

Discussion

The evidence base on simplified approaches has been growing, especially over the last five years, and the West and Central Africa region has been increasingly at the centre of testing and implementing different sets of simplifications. The evidence is promising for some simplifications alone (CHW approach, family-MUAC, MUAC-only programming) and for combined approaches (such as the OptiMA and ComPAS research protocols which combine various simplifications). The positive results documented when CHWs deliver treatment may be linked to the fact that, with community level care, caregivers do not have to travel to health centres which can be far away from their villages, thereby overcoming the well-documented barrier of distance to the nearest health facility. Evidence related to the combination of different simplifications is more recent, heterogeneous and includes some gaps given that context-specific approaches are promoted. This heterogeneity is

¹ UNICEF (2020) Treatment of Wasting using Simplified Approaches. A Rapid Evidence Review. <https://www.acutemalnutrition.org/en/resource-library/3KWsCWlxdQXSiXFOCME2fj>

² The ComPAS project refers to the Combined Protocol for Acute Malnutrition Study implemented by IRC and Action Against Hunger using a single treatment approach for children with wasting

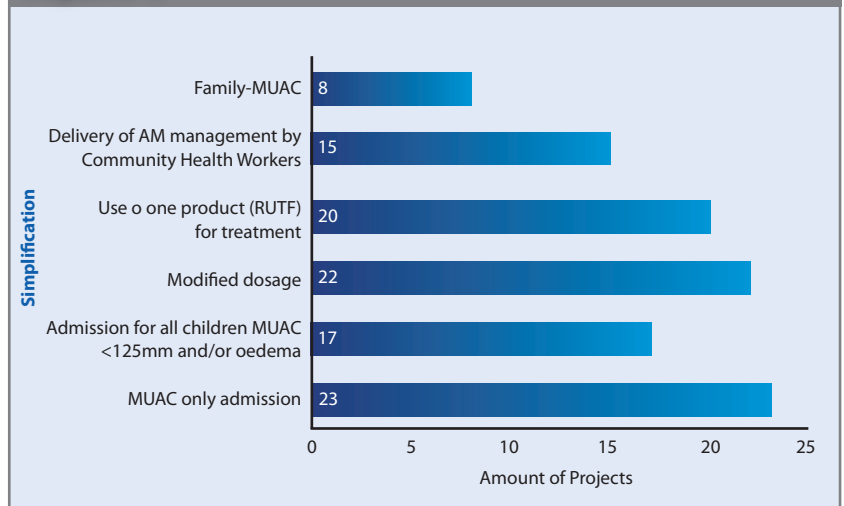
³ OptiMA: Optimizing treatment for acute Malnutrition, is a combined protocol implemented by ALIMA in several countries across West and Central Africa

linked to different organisations testing different combinations of simplifications under different circumstances making it challenging to directly compare results. However, the evidence available and consolidated in this review provides important programming insights that can inform the continued testing of these approaches.

Given that the nutrition outcomes of the various simplified approaches may vary according to the context and pre-existing challenges (e.g., high prevalence of stunting and distance to health centres), we recommend that simplifications continue to be selected and combined based on the context. Contextualising simplified approaches involves identifying barriers to early detection and treatment and understanding the humanitarian and nutritional situation to improve the overall effectiveness of treatment services. Outstanding questions remain regarding the optimal dosage for the most vulnerable children (MUAC <115 mm); continued research is needed in this area.

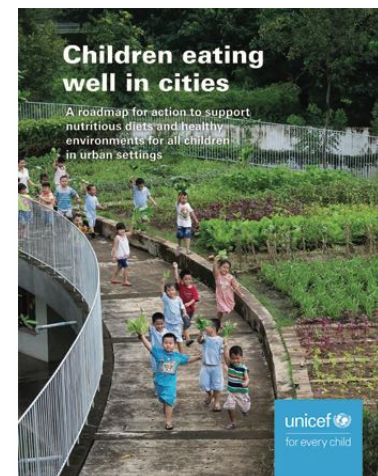
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Figure 1 Simplified approaches included in projects



MUAC = mid-upper arm circumference; AM = acute malnutrition; RUTF = ready-to-use therapeutic food

Children eating well in cities: A roadmap for action to support nutritious diets and healthy environments for all children in urban settings



New forces are influencing the global burden of child malnutrition. One such force is that of urbanisation, as people around the world increasingly leave the countryside for urban areas. As a result, many families are changing the way they feed their children. Traditional diets are increasingly being replaced by diets high in processed food, low in essential nutrients and high in salt, sugar and fat. There is increasing consumption of commercially produced snack foods and reliance on foods produced outside of the household. These trends not only increase the risk of overweight, obesity and diet-related noncommunicable diseases, they can also increase risk of micronutrient deficiencies and undernutrition. Although urban dwellers have more access to basic goods including food, they typically buy their food, which makes income a key factor in what they eat. While cities offer many opportunities for employment, cities house high concentrations of poor people who live in polluted or insecure environments and who are not able to meet the costs of basic goods. Cities are also more disconnected from food system supply chains which increases their vulnerability to unreliable food provision and

surging food prices. Given these factors, urbanisation clearly presents several challenges for tackling malnutrition.

Understanding how children and their caregivers experience urban environments is thus a critical starting point for designing actions to improve malnutrition rates. Given this, UNICEF developed a roadmap for action to support nutritious diets for families and children in urban contexts. This roadmap sets out how UNICEF can support urban nutrition activities through offering nutrition expertise, multi-sector action and collaboration with partners and existing city platforms. It aims to place child rights at the centre of the urban food agenda.

Using the Innocenti Framework on Food Systems for Children and Adolescents, the roadmap outlines actions for urban contexts across the supply side, external and personal environments, and behaviours of caregivers. It recognizes that other systems, including health, water and sanitation, education and social protection, also have crucial roles to play as part of a coordinated multi-sector approach to address diets and practices in urban contexts. The roadmap further

acknowledges the important role of governments at all levels to coordinate efforts and innovate to support good nutrition within urban environments. In many countries, through devolution processes, local governments are increasingly gaining responsibility for nutrition and already have been noted to be driving innovative approaches to reduce malnutrition. Several promising city-level practices now exist to illustrate how a city can initiate work on food and nutrition and the roadmap outlines several examples of city-level success stories. The roadmap also presents a schematic overview of how responsibilities and roles can be allocated between the local and national level to drive forward targeted nutrition actions. This includes actions for governance for children's access to nutrition and health, commitment to child rights, social protection, participation and engagement, food and nutrition in public institutions, water and hygiene, physical activity, food retail, food standards and labelling, health and nutrition-related taxes, marketing and conflicts of interest.

¹ <https://www.unicef.org/media/89396/file/Children-eating-well-in-cities.pdf>

Early lessons from Swabhimaan, a multi-sector integrated health and nutrition programme for women and girls in India

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INDIA

What we know: Poor nutrition status before and during pregnancy is a serious problem in India and a key driver of low birth weight and child undernutrition.

What this article adds: Swabhimaan is a five-year initiative (2016-2021) integrated within the Government of India's flagship poverty alleviation programme, Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM), across three states in India, carried out in partnership with UNICEF. The programme aims to mobilise women via village-level women's collectives to develop and implement integrated nutrition microplans and strengthen local government services in order to improve the nutrition outcomes of women and adolescent girls. The results are presented of a midline evaluation carried out in 2018-2019 covering villages in five different sites across the three states (including 3,171 adolescent girls, 1,856 pregnant women and 3,277 mothers of children under two years of age). The results reveal strong progress in implementation with 336 village-level microplans developed, 77,000 females screened and 15,122 identified as being at nutritional risk and referred for nutrition, agriculture and social protection support. Midline results show a reduction in thinness in adolescent girls (13.8% versus 18.5% at baseline) and mothers with children under two years of age (44.6% versus 48.4% at baseline) and an increase in the average mid-upper arm circumference of pregnant women (24.0cm versus 23.5cm at baseline). Evidence also shows improved household food security and improved uptake of government health, water, sanitation and hygiene and social protection services. Results suggest that utilising and funding women's collectives to respond to nutrition needs in their communities with integrated responses are feasible. The results of the endline evaluation and an impact evaluation will be forthcoming.

Background

The poor nutritional status of a woman before and during pregnancy is a major cause of foetal stunting and low birth weight (LBW). In India, stunting affects around 47 million (38%) children aged under five years (NFHS-4, 2015–16). An estimated five million Indian children (19%) are born with LBW, around 4.4 million of whom are born small for gestational age (NFHS-4, 2015–16). Most Indian women enter pregnancy with poor nutrition – 23% of women of reproductive age are too thin for their height (body mass index (BMI) less than 18.5 kg/m²) and 53 % of women are anaemic (increasing to 58% among pregnant women). Additionally, 8% of pregnant women (around 4.5 million) are ado-

lescents (NFHS-4, 2015–2016). Despite national and state level policies and programmes to deliver maternal care services in India, high quality coverage remains low.

The Indian Government's flagship poverty alleviation programme, Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM), implemented under the Ministry of Rural Development, aims to break the inter-generational cycle of poverty through the economic empowerment of vulnerable women and families. DAY-NRLM's women's collectives provide an opportunity to strengthen the delivery and promotion of women's nutrition services at community-level, linking livelihood promotion, women's nutrition promotion and women's em-

powerment, and harnessing the ability of women to plan and implement context-specific programme activities. A 2016 scoping study suggested that DAY-NRLM village organisations have the potential to manage grants for improving the last mile delivery of essential nutrition services for women provided they are enabled, supervised and incentivised (Sethi et al, 2017).

On the basis of these findings, Swabhimaan was set up as a five-year initiative launched in 2016 by DAY-NRLM in partnership with UNICEF India across three states in India (Bihar, Chhattisgarh and Odisha). The programme aims to improve the nutrition outcomes of women and adolescent girls using DAY-NRLM women's collectives as the key mode of delivery focusing on four primary target groups: adolescent girls, newlywed women, pregnant women and mothers of children under two years of age (secondary target groups include husbands, mothers-in-law and farmer producer groups). Community-led actions are delivered by DAY-NRLM. Systems strengthening activities also take place in convergence with four government departments to increase access to government services: the Department of Women and Child Development to increase the reach and quality of Integrated Child Development Services (ICDS), the Department of Health and Family Welfare for Village Health, Sanitation and Nutrition Days (VHSND), the Department of Water and Sanitation to improve water quality and achieve open defecation free villages and the Department of Food and Civil Supplies to increase the coverage of food subsidy schemes. The programme is funded by UNICEF India in Bihar, which serves as a demonstration and learning site, while the programme is led by the State Rural Livelihoods Mission (SRLM) in Chhattisgarh and Odisha with UNICEF providing a portion of the support costs. Built into this programme are baseline, midline and endline studies. The results of the midline study are presented here to help to fill the evidence gap on maternal nutrition interventions delivered via women's collectives in India.

Intervention

Swabhimaan provides a comprehensive package of 18 nutrition-specific and nutrition-sensitive interventions spanning the health, nutrition, agriculture and livelihoods sectors targeted at women at preconception, during pregnancy and after birth (Table 1). These interventions are delivered through a combination of community-led and systems strengthening actions (Table 2).

For the delivery of community-led actions, communities are engaged to customise a maternal nutrition delivery package responsive to local needs and to manage grants to implement the interventions. The community comes together under women's collectives promoted under DAY-NRLM made up of female representatives from self-help groups (SHGs) and their federations (Village Organisations (VOs) and Cluster Level

Table 1 Swabhimaan package of nutrition-specific and nutrition-sensitive interventions

	Relevant target group		
	Adolescents & newly wed	Pregnancy	Lactation
Improve food and nutrient intake			
Access to generalised household ration through Public Distribution System, a food subsidy scheme	✓	✓	✓
Balanced energy protein supplementation through access to supplementary rations	✗	✓	✓
Access to knowledge and choices about how to increase maternal dietary diversity	✓	✓	✓
Access to knowledge and support for nutrition-sensitive agriculture at home (kitchen gardens promoting nutritious foods and diet diversity) and community-based food insecurity coping strategies	✓	✓	✓
Prevent micronutrient deficiencies and anaemia			
Iron and folic acid supplementation	✓	✓	✓
Universal use of iodised salt	✓	✓	✓
Deworming	✓	✓	✗
Calcium supplementation	✗	✓	✓
Access to information and commodities such as insecticide treated bed-nets for malaria prevention	✓	✓	✓
Access to information on preventing tobacco and alcohol use in pregnancy	✗	✓	✗
Increase access to health services and special care to nutritionally 'at risk' women			
Early registration (in first trimester) in outreach services	✗	✓	✗
Recording and monitoring of nutritional status and special community-based at nutritional risk package	✓	✓	✓
Quality reproductive health, antenatal and postnatal care	✓	✓	✓
Access to knowledge and entitlements for promotion of institutional deliveries and maternity benefits	✓	✓	✓
Increase access to education and commodities for water, sanitation and hygiene			
Sanitation and hygiene (including menstrual hygiene) education	✓	✓	✓
Access to safe drinking water and sanitation commodities	✓	✓	✓
Prevent early, poorly spaced or unwanted pregnancies			
Promotion of secondary education and education for delaying the age at marriage to legal age	✓	✗	✗
Access to information and family planning commodities for delaying age at first pregnancy and prevention of repeated pregnancies	✓	✓	✓
Women's collective voice and empowerment for decision-making to prevent child marriage, violence against women, child spacing and other gender-related issues	✓	✓	✓

✓ = relevant target group; ✗ = non-relevant target group

Table 2 Community-led and systems strengthening actions under Swabhimaan

Responsible agency/service provider	Intervention	Frequency
Community-led actions		
Village Organisation (VO)		
Social action committee	Selection of <i>Poshan Sakhi</i> (one per VO)	Once
<i>Poshan sakhi</i> /community resource person	Integrated nutrition microplanning (12 days over two months)	Once, followed by annual review
	<i>Maitri baithak</i> (translated as 'friendly meeting') of women open to non-group members using participatory learning and action (PLA)	Monthly
	One additional monthly home visit/group meeting of nutritionally 'at risk' women	Monthly
Krishi mitra/village resource person (VRP)	<i>Maitri kishan baithak</i> (translated as 'friendly farmers meeting') on nutrition-sensitive agriculture PLA	Monthly
	Home-based <i>Poshan</i> (translated as 'nutrition') beds or garden/backyard poultry	Monthly
Cluster-level federation (CLF)		
Social action committee	Families with women and children at risk of undernutrition linked to agri-poultry linkage and social protection schemes	Monthly
	Loans for secondary education	Monthly
	Creating farmer training school sites	Monthly
	Training for <i>Poshan sakhi</i> and <i>Krishi mitras</i>	Quarterly
	Newlywed couples' meetings and social drives	Biannual
	Entitlement camps and health check-ups for self-help group members	Biannual
	Review of integrated nutrition plan	Annual
Systems strengthening actions		
	Strengthening of Village Health, Sanitation and Nutrition Days including services for at nutritional risk and newlyweds.	Monthly
	Training of auxiliary nurse midwives on VHSND	Quarterly
	Convergence review at district and block level to address VHSND bottlenecks	Quarterly
	Orientation of service providers Public Health Distribution System, Integrated Child Development Services and Department of Water and Sanitation to ensure communities receive entitled services	Annual

Federations (CLFs)). Each federation develops an integrated nutrition microplan that identifies and prioritises nutrition and related problems among target groups in their village/s, an annual plan of activities and a budget. These budgets are collated at block level, reviewed and approved by DAY-NRLM and submitted to the SRLM, an autonomous body under the state government, which then provides the annual grant to each VO accordingly.

The development of nutrition microplans is facilitated by a social action committee (SAC) for each VO. The SAC nominates an active SHG member to be the Community Resource Person (CRP). Women are eligible for nomination who are literate, effective communicators and who have graduated out of poverty. CRPs, known locally as *Poshan Sakhis* and *Kishori Sakhis*, undergo three days of pre-service training on integrated nutrition microplanning, the use of mid-upper arm circumference (MUAC) tapes

and measurements for screening nutritionally 'at risk' adolescent girls and women (MUAC <19 cm and <23 cm, respectively) (Bulliyyag, 2007; Tang, 2013) and participatory learning and action (PLA) techniques to facilitate monthly meetings for women and adolescent girls. Following their training, CRPs facilitate the development of integrated nutrition microplans, supervised by the SRLM, and also provide home-based counselling for target groups, food demonstrations and support for the development of household nutrition gardens (gardens growing fruits and vegetables for household consumption).

The CRPs receive INR450 (USD\$7) to develop an integrated nutrition microplan and thereafter a similar monthly incentive for facilitating the implementation of planned activities. CLFs receive grants including INR500 (~USD\$7) for meetings with newlywed couples, INR500 (~USD\$7) for each 'welcome kit' given to newlywed couples with essential items (iron-folic

acid (IFA) supplements, contraceptives, sanitary napkins), INR1500 (~USD\$22) to review each VO's integrated nutrition microplan and INR5000 (~USD\$77) to develop farmer training school sites. Community-led interventions are monitored through the collation and analysis of monthly reports submitted by CRPs for each VO that are then reviewed by CLFs and block-level supervisors.

The system strengthening interventions include quarterly training of government accredited social health activists (ASHA) and auxiliary nurse midwives (ANM) to strengthen the delivery of the fixed monthly health camps (VHSND) for the provision of antenatal care (ANC) check-ups, counselling, micronutrient supplementation, take-home rations under the supplementary nutrition programme, immunisation, weight monitoring, family planning and the identification and care of groups at nutritional risk. Training is also provided to strengthen Adolescent Health Days to improve access to adolescent health and nutrition services. In addition, health service providers (ASHA, ANM, Anganwadi workers (AWW) and lady supervisors of ICDS and the Public Distribution System (PDS) fair price shop owners are regularly engaged with to improve the delivery of the service package and entitlements. Regular review and convergence meetings are conducted with the departments involved in service delivery. Reporting on system strengthening is activity-based (monthly for VHSNDs and biannually for trainings/refresher trainings) and overall programme reports are reviewed annually by the national government.

Evaluation methodology

To test the delivery and impact of the Swabhimaan programme, baseline, midline and endline cross-sectional surveys were undertaken between 2016 and 2021 in three selected Indian states covering villages across five different sites. The baseline survey was conducted between October 2016 and January 2017 and included 6,352 adolescent girls, 2,573 pregnant women and 8,755 mothers of children under two years of age. The midline survey was conducted between September 2018 and June 2019 with 3,171 adolescent girls, 1,856 pregnant women and 3,277 mothers of children under two years. The endline survey will be conducted in 2021. Sample size calculations were conducted for each state that accounted for a 5% refusal rate and a design effect of 1.5. Respondents were recruited using a simple random sampling technique.

A standardised, bilingual quantitative questionnaire (in English and the local language) was administered to all target groups. Information obtained from the surveys included sociodemographic and household characteristics, educational attainment, diet diversity, household food security, the availability of a homestead kitchen garden and access to health, ICDS and SRLM services and decision-making practices. Anthropometric measurements (weight, height and MUAC) were taken using standard techniques. Quantitative data collected

Table 3 Coverage of health and nutrition services for adolescent girls, pregnant women and mothers of children under two in intervention areas in Swabhimaan in baseline (2016-17) and midline (2018-19) surveys

Indicators (%)	Adolescent girls (AG)			Pregnant women (PW)			Mothers (M2)		
	Baseline (N=3054)	Midline (N=1535)	P-value	Baseline (N=1274)	Midline (N=886)	P-value	Baseline (N=4441)	Midline (N=1625)	P-value
Adolescent girls with BMI < -2SD	18.5	13.8	4.7***	-	-	-	-	-	-
Mean MUAC among pregnant women (in cm)	-	-	-	23.5	24.0	0.5	-	-	-
Mothers of children under two with <18.5 kg/m2	-	-	-	-	-	-	48.4	44.6	3.8***
Mothers of children under two with severe thinness	-	-	-	-	-	-	7.0	6.5	0.5
Achieving minimum dietary diversity score (five of 10 food groups)	41.3	48.0	-6.7***	43.5	51.5	-8.0***	37.0	52.1	-15.1***
Consuming IFA tablets (≥4: AG =25; PW in the month preceding the survey =100 in last pregnancy: M2)	15.0	40.5	-25.5***	24.8	29.4	-4.6***	18.4	23.2	-4.8***
Living in a household with iodized salt	97.0	90.0	7.0	90.8	87.6	-2.8	96.2	89.4	6.8
Living in food secure households	-	-	-	31.3	38.8	-7.5***	22.2	34.4	-12.2***
Receiving their minimum PDS entitlement in month preceding survey	-	-	-	-	-	-	60.7	71.9	-11.2***
Living in households with a kitchen garden	43.5	13.3	30.2	36.0	12.3	23.7	32.5	11.3	21.2
Living in households with an improved toilet	18.2	43.0	-26.5***	16.4	40.7	-24.3***	19.7	39.1	-19.4***
Using safe pads or sanitary pads	31.6	57.3	25.6***	-	-	-	-	-	-
Antenatal check-up (first trimester: PW at least four ANC in last pregnancy: M2)	-	-	-	34.2	51.2	-17.0***	18.2	34.1	-15.9***
Weight was monitored* PW, weighed at least four times last pregnancy M2	-	-	-	66.0	86.2	-20.2***	24.1	29.4	-5.3***
Received one dose of albendazole in second trimester	-	-	-	10.6	18.5	-7.9***	21.4	32.5	-11.2***
Took calcium tablets in 2nd trimester*	-	-	-	23.8	55.4	-31.6***	29.7	60.4	-30.7***
Using a modern family planning method (before the current pregnancy: PW, currently: M2)	-	-	-	7.1	13.4	-6.3***	16.3	19.9	-3.6***
Attended at least three VHSNDs in six months	-	-	-	14.9	14.4	-0.5	24.4	26.7	-2.3**
Receiving ICDS entitlement for supplementary food in month preceding survey	-	-	-	34.7	55.8	-21.1***	44.5	77.0	-32.5***
Delivered in a health facility in last pregnancy	-	-	-	-	-	-	73.3	76.4	-3.1***
Accessed maternity benefit scheme	-	-	-	-	-	-	53.0	47.5	5.5
Attending three monthly meetings on health and nutrition related themes in last year	-	-	-	11.0	7.4	3.6	7.2	7.9	-0.7

Level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

was entered using the Census and Survey Processing System and analysed using STATA 15.1. A midline process evaluation was also undertaken using a mixed-method approach comprised of a cross-sectional survey and qualitative data collection. The impact evaluation has been registered with the Registry for International Development Impact Evaluations (RI-DIE-STUDY-ID-58261b2f46876) and the Indian Council of Medical Research National Clinical Trials Registry of India (CTRI/2016/11/007482). The impact evaluation's endline survey and programme evaluation of Swabhimaan will be conducted in 2021.

Results

Progress of implementation

Programme monitoring of Swabhimaan shows all 336 VOs across the three states developed integrated nutrition microplans that identified community priorities and actions. By the end of 2019, VOs had screened over 77,000 adolescent girls, pregnant women, mothers of children under two years of age and newlywed women using MUAC, identifying nearly 15,122 indi-

viduals at nutritional risk for customised counselling, home visits, food demonstrations, the development of a nutrition garden or backyard poultry and, for some, links with government social protection schemes. By the end of 2019, CRPs had facilitated a total of 37,079 monthly meetings (maitri baithaks) across the intervention areas. Newlyweds had been oriented to maternal health issues in special biannual camps, provided with 'welcome kits' (contraceptives, IFA, sanitary pads, soap), inducted into SHGs and were mobilised to attend maitri baithaks. Over 1,000 adolescent groups have also been formed and are currently active across the three states.

VOs and CLFs have successfully collaborated with agriculture universities/training centres to design nutrition-sensitive farms and backyard gardens. Households with target individuals at nutritional risk have been prioritised to develop nutrition gardens in backyards and/or initiate poultry activities through small loans provided by the SHGs. By the end of 2019, over 5,000 nutrition gardens had been developed across the three states.

Swabhimaan has also successfully strengthened the supply side of health services by supporting a change in government policy that means that women are now screened for nutritional risk within VHSNDs, with those identified as being at risk then linked to the appropriate services. This has led to a significant increase in the participation of target groups in VHSND from 29.5% across the three states at the start of the programme to 85% by 2019.

Changes in maternal and adolescent health and nutrition outcomes and practices

Table 3 presents comparison results between the baseline and midline evaluations. Pre-intervention, the proportion of thin adolescent girls (BMI < -2SD) was 18.5% which reduced significantly to 13.8% ($p < 0.001$) in 2019 after programme implementation. The proportion of thin mothers of children under two years (BMI < 18.5 kg/m2) was 48.4% in 2016-17 (compared to the national average of 23%) and, by 2019, the proportion of thin mothers reduced to 44.6%. The mean MUAC among pregnant women



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was 23.5cm which increased to 24.0cm by 2019. Severe thinness among mothers of children under two years of age was 7.0% in 2016 which reduced to 6.5% by 2019 (Government of India cut-off for thinness in adults is <23 cm) (IIPS, 2016a; IIPS, 2016b; IIPS 2016c; Ministry of Health and Family Welfare, 2017).

In comparison to the baseline, a higher proportion of pregnant women (baseline 43.5%, midline 51.5%) and mothers (baseline 37.0%, midline 52.1%) achieved minimum dietary diversity scores than adolescent girls (baseline 41.3%, midline 48.0%) ($p<0.001$). At midline, all target groups showed significant improvement in IFA compliance as compared to baseline. The highest improvement was recorded among adolescent girls whose IFA consumption increased by 25.5% ($p<0.001$). At midline, a 5% increment in IFA compliance was registered among pregnant women and mothers, however, the overall consumption still remains low at 29.4% and 23.2%, respectively ($p<0.001$).

Data shows an 8-12% improvement in the proportion of women living in food secure households ($p<0.001$) from baseline to midline, however over 60% of women still lived in food insecure households. By midline, 71.9% of mothers' households had access to PDS entitlement as compared to only 60.7% at the baseline ($p<0.001$). At midline, about 40-43% of the target groups' households had improved toilets, with a 27%, 24% and 19% increase in adolescent girls', pregnant women's and mothers' households having an improved toilet ($p<0.001$). At baseline, only 31.6% of the adolescent girls used sanitary pads which had significantly increased to 57.3% ($p<0.001$) by the midline.

At midline, 51.2% of pregnant women and 34.1% of mothers had received an ANC in the first trimester and at least four ANCs in their last pregnancy respectively which corresponds to a 16-17% ($p<0.001$) improvement as compared to the baseline. The proportion of pregnant women who had their weight monitored during their current pregnancy (baseline 66.0%, midline 86.2%) and mothers whose weight was monitored at least four times during the last pregnancy

(baseline 24.1%, midline 29.4%) increased ($p<0.001$). Pregnant women and mothers who received one dose of albendazole in their second trimester increased by 8-11% ($p<0.001$) by the midline. A drastic improvement was recorded in the proportion of mothers (baseline 29.7%, midline 60.4%) and pregnant women (baseline 23.8%, midline 55.4%) who took calcium tablets in their second trimester ($p<0.001$).

The use of modern family planning methods among women was extremely low at baseline (pregnant women 7.1%, mothers 16.3%). However, modest improvements were recorded in the use of modern family planning methods by both pregnant women and mothers (4-6%, $p<0.001$) at midline. A slightly higher proportion of mothers attended at least three VHSNDs by midline (26.7%, $p<0.05$) than at baseline (24.4%). ICDS entitlements were better utilised and significant improvements were recorded in the utilisation of ICDS services by pregnant women (baseline 34.7%, midline 55.8%) and mothers (baseline 44.5%, midline 77.0%) ($p<0.001$). Mothers who opted for institutional delivery increased from 73.3% in 2016 to 76.4% by the baseline ($p<0.001$).

Midline qualitative results revealed that CRPs (Poshan Sakhis) conducted regular meetings, counselling and follow-ups with the target groups. Responses suggested that adolescent girls and pregnant women have adopted appropriate behaviours related to dietary intake and Water, sanitation and hygiene (WASH) practices and have increased the number of visits to health service points, such as Anganwadi Centres and VHSNDs, to access health and nutrition services. CRPs observed an increased awareness about the entitlements and services available and a visible change in the practice and knowledge of the community on food and WASH behaviours. They also shared their experience of improved coordination with health service providers (AWW, ASHA and ANM) which supported access to services by the target groups. However, they reported challenges in mobilising target groups regularly for meetings and observed gender-related issues in the target groups, such as women eating least and last, a skewed division

of labour in the household, domestic violence and low decision-making power as barriers to ensuring improved health and nutrition outcomes of women and girls.

Lessons learned for scale up

The results between the baseline and midline evaluations indicate improvement in the coverage of health and nutrition services among all target groups in the intervention areas including adolescent girls, pregnant women and mothers of children under two years of age across the three states of Bihar, Chhattisgarh and Odisha. The results also demonstrate statistically significant improvement in dietary diversity scores in all target groups, BMI in adolescents and mothers of children under two years of age and some improvement (although not statistically significant) in MUAC scores in pregnant women. Access to maternal nutrition services have also improved, although uptake remains low for some services including IFA supplementation for pregnant women and mothers, attendance at a minimum of four ANC sessions and the participation of mothers in VHSNDs. Access to toilets still remains low with over half of the participants still not having access to a toilet despite focused programmes implemented by the Department of Water and Sanitation.

Lessons from programme implementation provide evidence that VOs and CLFs can develop microplans and manage grants to strengthen the provision of a maternal nutrition service package for women and girls at nutritional risk in underserved areas. This is a shift from the earlier approach of last mile delivery of health services being a voluntary task that required much investment from the health volunteers themselves. Early results also show that CRPs can successfully mobilise women and adolescent girls and organise monthly discussions on priority nutrition issues using a PLA approach despite societal resistance and challenges in mobilisation. The microplanning process is a critical initiator of collective thinking, consensus on nutrition problems and resolute action. The context where Swabhimaan operates is marked by stark social and gender inequities (Reshmi, 2019). CRPs have been able to overcome these resistances and have made women's health important for the communities through regular monthly meetings. VOs and CLFs are also able to collaborate with agriculture universities/training centres to design nutrition-sensitive farms and backyard gardens and enable access to grants to facilitate this. VO and CLF activities under Swabhimaan can be scaled up at INR90000 (~USD\$13,000) in a resource block. The initiative in the three states has resulted in the creation of learning and implementation resources and trained CRPs and VRPs, such that the scale-up cost is mainly funding the training of new CRPs/VRPs and incentives for service delivery. Gradually, it is possible to build these costs into the annual plans of the SRLMs.

In addition to community-led activities, nutrition outcomes are dependent on the availability

and access to timely health and nutrition services. This requires effective interventions that target supplies. The second strategy of this programme focuses on systems strengthening, supported by technical assistance from the UNICEF State Offices of Bihar, Chhattisgarh and Odisha. The coordination of government departments is critical to ensure that essential women's nutrition interventions are available. Convergence under the POSHAN Abhiyaan promotes coordinated, multi-sector efforts involving all line departments that contribute towards nutrition such as health and family welfare, water and sanitation and rural development. This is possible through the joint planning and review of activities and quarterly convergence meetings at block and district level are used as a platform to undertake this. This is critical as this process enables the regular review of nutrition indicators based on the village microplans with all the line departments supporting in addressing implementation gaps in service delivery. To improve the quality and reach of health and nutrition services of Health and ICDS departments, the Swabhimaan programme facilitated the revision of the VHSND guidelines and integrated maternal calcium supplementation, deworming and the screening of women at nutritional risk using maternal MUAC into the guidelines for all three states (Bihar, Chhattisgarh and Odisha). It also expanded the target base by including newlywed and adolescent girls in the target group. The training of service providers on the revised VHSND guidelines at state, district and block levels ensured quality implementation. This effective integration of a systems strengthening intervention, which includes regular follow-up, review and monitoring, and the training of service providers for improvement of service delivery led to improvements on the supply side.

Limitations and challenges

As in most programmes that operate in real settings, systemic challenges exist. These are related to delays in the flow of funds for government schemes on which the delivery of maternal nutrition services hinge, delays in the procurement and/or distribution of supplies (medicines/supplements and rations) and health worker strikes. Secondly, the SHG-VO-CLF platform has varying maturity and stability across and within states, with some groups well established while some are fairly new. Consequently, the pace of implementation is non-uniform. In order to reduce this bias, Swabhimaan has retained the originally identified collectives (SHG-VO-CLF) in the research despite the emergence of newer collectives in its implementation sites. As new collectives are mobilised at the same implementation sites, they will also be included in the programme with the support of the existing structure. Furthermore, as these are essentially savings groups, layering on nutrition interventions is a slow and cautious process. DAY-NRLM has mentors in its operational structure to provide handholding support on the thrift and credit activities who could also be trained in programme planning and grant management for the provision of the

maternal nutrition service package. Regular handholding and supervision support to the CLFs and VOs is critical to ensure their activities are nutrition-sensitive and responsive. These community institutions can be strengthened and capacitated through investments in integrated training and capacity-building to respond to the health and nutrition needs of the community.

Way forward

DAY-NRLM, in partnership with UNICEF, will scale up Swabhimaan's maternal nutrition approach through NRLM platforms in alignment with its POSHAN Abhiyaan mandate. The nested impact evaluation showed promising results, informing the SRLMs of the three states to initiate scale-up with the horizontal expansion of these interventions while retaining the impact evaluation sites and protecting them from contamination until the endline evaluation.

Within two years of programme implementation, each of the SRLMs has initiated the scale-up of the programme. In Chhattisgarh, based on the success of Swabhimaan in the pilot block of Bastar, the SRLM has approved the scaling up of Swabhimaan in 16 blocks across 12 districts. This is being done in a phased manner with eight blocks across six districts in 2018 and the remaining eight blocks in the subsequent years. Forty CRPs have been chosen from the pilot block as resource persons/master trainers to roll out training in the scale-up blocks. In Odisha, the Odisha Livelihoods Mission (OLM)¹ plans to saturate 12 blocks across both intervention districts by 2020. These will then serve as incubation blocks and learning from these locations will be taken up across the state. The mission intends to develop 700 community resource persons to support the scale-up of interventions in 14 blocks of three districts. The OLM has also chosen to set up vertical nutrition programmes to provide support for capacity-building of state and district level programme staff. Similarly, in Bihar, scale-up was initiated in 2019 and will see the intensification of interventions and the saturation of each implementation block by 2021. Existing cadres of staff

will act as resource persons in the remaining clusters. Further, phase II will also focus specifically on addressing gender norms and social issues that impact upon women's nutrition and access to entitlements. Phase II will also focus on replicating the nutrition-sensitive integrated farming systems (NSIFS), a nutrition-based livelihood option, in the scale-up areas. This is in keeping with the Bihar SRLM's health, nutrition and sanitation strategy to address undernutrition in marginalised communities.

Conclusion

Over the three years of implementation of the Swabhimaan programme, the findings suggest that both the community-led and systems strengthening components of the programme have significant impact on increasing the coverage of essential nutrition-specific and nutrition-sensitive interventions for women and girls. A key component is the development of integrated nutrition microplans developed by the community, utilising the funds provided by the SRLMs. The results of the midline evaluation demonstrate that this is a feasible approach and that women's collective institutions are able to use cash grants to respond to community-based needs and are able to implement actions to address health and nutrition problems in their community. The results of the endline and impact evaluations are forthcoming and will provide further evidence to inform maternal and preconception nutrition policy at national and state level in support of the scale-up of mechanisms that integrate nutrition interventions into large-scale poverty alleviation programmes delivered via women's collectives.

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Watch a video about this programme at <https://www.youtube.com/watch?v=bqn-qV2V4tiw>

¹ Odisha Livelihoods Mission (OLM) is Odisha's SRLM, an autonomous society under Department of Panchayati Raj, Government of Odisha, implementing National Rural Livelihoods Mission, India's large-scale poverty alleviation programme.

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