

Field Exchange

Emergency Nutrition Network



Contents

1 Editorial

Field Articles

- 3** Enabling low-literacy community health workers to treat uncomplicated SAM as part of community case management: Innovation and field tests
- 11** Stunting and wasting in children under two years old in a semi-nomadic pastoralist population in Kenya
- 86** Transforming media coverage of nutrition in Kenya
- 89** Management of SAM in the Philippines: from emergency-focused modelling to national policy and government scale-up
- 93** Severe acute malnutrition: An unfinished agenda in East Asia and the Pacific
- 97** Experiences of multi-sector programming in Malawi
- 106** Save the Children's IYCF-E Rapid Response in Croatia
- 110** Adolescent inclusion in the Care Group approach: The Nigeria experience
- 113** Assessment of adolescent girl nutrition, dietary practices and roles in Zimbabwe
- 116** Designing a food plate for dietary counselling of pregnant women in Bangladesh

Global Nutrition Cluster Case Studies

- 55** Editorial
- 57** Scaling up nutrition services and maintaining service during conflict in Yemen: Lessons from the Hodeidah sub-national Nutrition Cluster
- 61** Philippines Nutrition Cluster: lessons learnt from the response to Typhoon Haiyan (Yolanda)
- 65** Overcoming nutrition information challenges in South Sudan
- 68** Changes to Nutrition Cluster governance and partnership to reflect learning and operational realities in Somalia
- 72** Bangladesh Nutrition Cluster: A case in preparedness
- 76** Nutrition coordination in Ukraine: Experiences as a sub-cluster of health

Research

- 14** The 2001-03 famine and the dynamics of HIV in Malawi: A natural experiment
- 15** Routine amoxicillin use in treatment of uncomplicated SAM in children
- 16** Short children with a low MUAC respond to food supplementation: An observational study from Burkina Faso
- 18** Effect of a community-led sanitation intervention on child diarrhoea and child growth in rural Mali
- 19** Are studies underestimating the effects of sanitation on child nutrition?
- 20** Review of the role of food and the food system in the transmission and spread of ebola virus
- 22** Effect of short-term supplementation with ready-to-use therapeutic food or micronutrients for children after illness for prevention of malnutrition: a randomised controlled trial in Uganda
- 23** Data sharing in public health emergencies: A call to researchers
- 24** Acceptability and feasibility of a child-feeding toolkit in Malawi
- 25** Ten steps to successful breastfeeding programme in DRC: A cluster-randomised controlled trial
- 28** Weight-for-height and MUAC used independently to diagnose acute malnutrition Policy implications
- 30** Nutrition needs and best practices for formerly trafficked female children and adolescents
- 31** Is MUAC alone a sufficient criterion for admission of children at high risk of mortality in South Sudan?
- 32** Auditing the identification and inpatient management of acute malnutrition in infants under six months in Malawi
- 34** Relationship between MUAC and weight changes in children aged six to 59 months
- 35** Integrated protocol for severe and moderate acute malnutrition in Sierra Leone
- 37** New Lancet Series on breastfeeding
- 37** Why invest and what it will take to improve breastfeeding practices?
- 39** Breastfeeding in the 21st century Epidemiology, mechanisms, and lifelong effect
- 41** Social Return on Investment (SROI) assessment of a Baby-Friendly Community Initiative in urban poor settings, Nairobi, Kenya
- 44** Community weighting of barriers and boosters in Democratic Republic of Congo

- 48** Putting kwashiorkor on the map
- 49** Improving the quality of nutritional survey data worldwide: Putting Child Kwashiorkor on the Map Initiative
- 51** Community-based management of severe malnutrition: SAM and SUW in children under five in the Melghat tribal area, central India

News

- 80** Care Groups in Emergencies: Research Report and Recommendations Guide
- 80** Regional Multi-Sectoral Nutrition Strategy Global Learning and Evidence Exchange
- 80** Nutrition Cluster Advocacy Strategic Framework and Toolkit
- 81** Nutrition for Developing Countries 3rd edition now available
- 81** ENN hosted Wasting-Stunting Technical Interest Group meeting
- 82** MAMI Interest Group meeting
- 83** En-net update
- 84** Maximising the nutritional impact of humanitarian food assistance – ECHO Desk review
- 84** Update on guidance on infant and young child feeding in emergencies underway
- 85** ENNs knowledge management project in support of the SUN Movement
- 85** Linking agriculture and nutrition education for improved young child feeding
- 85** Issue 6 of Nutrition Exchange now available

Views

- 101** Food for thought: Supplementary feeding programme or 'antenatal feeding programme' for pregnant women
- 103** *Postscript* Integrating nutrition and antenatal care: A reproductive health perspective
- 104** Severe acute malnutrition management in India's children: The riddle

Letters

- 105** The hard face of resilience and accountability

Profile

- 120** Interview with Jean Humphrey, SHINE trial



Dear readers

This rather large issue of Field Exchange has a typically wide range of material from field practitioners and researchers. Some examples of innovative practice include an article by the International Rescue Committee (IRC) that has developed and is field testing approaches for treatment of uncomplicated severe acute malnutrition (SAM) by low-literacy community health workers, as part of community case management in South Sudan. We also have a summary of research conducted in Sierra Leone on an integrated moderate acute malnutrition (MAM) and SAM treatment programme. It is good to see adolescent care featuring, a huge gap area when it comes to nutrition programming; International Medical Corps (IMC) share experiences of adolescent targeted programming in Nigeria and Zimbabwe. The low profile of and access to SAM treatment in emergency-prone East Asia and the Pacific, despite the high burden of wasting, and actions to address this are the subjects of a thoughtful article by the UNICEF regional team. It complements nicely an article on the progress made in the Philippines on this front, which has partly come about through the capacity gaps identified and addressed with external humanitarian support. As ever, the pros and cons of mid upper arm circumference (MUAC) and weight-for-height measures in determining access to acute malnutrition treatment programmes remain a hot topic amongst some of the nutrition fraternity; we feature a cross-section of research that no doubt will fuel discussions that will feature in future issues of Field Exchange.

This editorial would like to focus on two sets of material in particular; namely the new Lancet series on breastfeeding and related articles, and a series of case studies on Global Nutrition Cluster (GNC) experiences in six recent emergencies (Ukraine, Somalia, South Sudan, Yemen, Philippines and Bangladesh).

The first paper in a recent Lancet breastfeeding series reinforces that where infectious diseases are prevalent, exclusive breastfeeding (EBF) is critical to infants under 6 months of age in terms of mortality and infectious disease, and remains significant for children aged 6-24m in reducing mortality and infectious disease morbidity. It's a worry that in resource poor settings, EBF rates remain stubbornly low. The Lancet paper calls for the need to tailor breastfeeding support strategies to specific patterns recorded in each country. Research from the Democratic



Samburu mother and her baby, Kenya

IMC, Kenya, 2014

Republic of the Congo (DRC), summarised in this issue, reflects such an approach, where a short-cut version of the Ten Steps to Successful Breastfeeding programme made a difference to EBF rates in the target group. Interestingly, adding in community support groups to the clinic-based programme probably made things worse – misinterpretations and mixed messages by the wider interested community were, in all likelihood, behind this finding.

Behaviour change communication (BCC) on feeding practices is a common thread to so-called 'nutrition sensitive' programming. It would be interesting to examine – through literature review and likely research – the impact of such BCC, since many factors influence infant feeding decisions. A selection of these are reflected in an article on the social impact of the Kenyan government's Baby Friendly Community Initiative. Whilst some expected and unexpected social returns were positive (e.g. having healthier children, more paternal support of mothers), some significant negative outcomes of improving maternal and infant and young child feeding (IYCF) were also identified. Mothers reported they were now more worried knowing how they should be feeding their children but in reality, not being able to do so in their circumstance. Key informants reported less income due to job loss as a result of following optimal feeding practices, increased household expenditure on food and health care, increased workload of healthcare providers, financial strain on, and increased stress of, community health volunteers.

The investment case for breastfeeding is the focus of the second Lancet paper. The costs of not breastfeeding in terms of lost Gross Domestic Product (GDP) is used to support the case for breastfeeding investment. However the costing – based on economic calculations around cognitive development consequences of not breast-

feeding and increased health costs of sicker non-breastfed children – does not capture the significant opportunity cost to mothers of feeding options, in terms of lost income and time. Such costs need to be monetised and captured in economic calculations or explicitly stated as absent; breastfeeding is not free. This paper reflects a lack of data that is critical to moving forward (or to halt us fighting a losing battle) on the feeding front. Six actions are proposed related to advocacy, societal attitudes, political will, breastmilk substitute (BMS) industry regulation, scale-up of interventions, and removal of structural and societal barriers. But reliable estimates of the costs and benefits of the actions needed to support optimal breastfeeding, including maternity entitlements, are missing. Just one available study estimates that it will cost \$17.5 billion globally for a large range of interventions, much of which is maternity entitlements for poor women. Asia and Africa account for 80% of the millions of women with no or inadequate maternity protection; the economic implications and feasibility for governments of recommendations, and how accessible changes would be for the poorest women, is poorly understood. How fair is it to engage in BCC with individual mothers in these challenging contexts, in the absence of the societal and community support to enable change, and how much has it cost us trying and largely failing to do so? It would have been valuable if the Lancet economic analysis could have gone further and scrutinised what investments have been made to date and for what gains; it was not possible to ascertain national or overseas aid budgets for the protection or support of breastfeeding.

One of the challenges for humanitarian programming is how to appraise relative risk in mixed feeding contexts and minimise risks for all infants. The Syria and Ukraine crises pose particularly challenging contexts given the low

rates of EBF and increasing tendency prior to the crises to use BMS (the Lancet series calculates that global infant formula sales in 2014 were US\$44.8 billion, most of the 50% growth by 2019 projected in the Middle East, Africa and Asia-Pacific regions). Middle income countries inhabit a grey area between high income and low income settings with declining breastfeeding rates (improved rates more likely amongst the better off women), yet still carrying some of the infectious disease burden that fuels morbidity and mortality risk. There are also inconsistencies in global perceptions of best practice and field experiences. Increases in infant mortality have not been demonstrated amongst the refugees in Jordan, Lebanon and Turkey amongst refugees nor reported in the Europe migrant crisis, despite widespread infant formula use in risky environments. Children may well be sicker and undernourished (we just haven't measured it) but it may also reflect that mothers engage their own risk minimisation strategies and adapt more effectively than we give them credit for. An article by Save the Children on their IYCF response in Croatia reflects the challenges of meeting the needs of both breastfed and formula dependent infants in a rapidly transiting population and the necessary compromises in terms of assessment and support offered. These and many more experiences will be reflected in an update of the Operational Guidance on IYCF in emergencies currently underway (see news piece in this edition).

Our second editorial focus relates to findings from recent and ongoing GNC coordination experiences summarised in this issue. Three themes and challenges from the GNC case studies are worth mentioning here. The first relates to the default response in emergencies (first reported on extensively in the Field Exchange special issue (49) on the response to the



Samburu women farming, Kenya

Syria crisis) to focus on treatment of acute malnutrition in young children and IYCF to the exclusion of other groups and nutrition challenges. There are many questions for us to ponder. For example, do we have sufficient capacity and understanding to address the needs of the elderly in emergencies (including non-communicable diseases (NCDs)) and do we know how to address high levels of stunting. Emergency contexts are rapidly changing and yet our protocols and institutional capacity seems to be lagging behind these changes.

A second challenge appears to be how to effect inter-sector planning and coordination so that nutrition objectives can become part of so called 'nutrition sensitive' planning in emergencies. Again, the response to the Syria crisis first highlighted the lack of influence of nutrition actors on widespread social protection planning. The GNC case studies in this issue again demonstrate lack of coordination between the nutrition sector and other sectors to enhance the nutrition sensitivity of programming in water, sanitation and hygiene (WASH), food security, health and social protection. A key question is whether the overall cluster mechanism does enough to

support the potential for inter-sector collaboration and planning and what role the nutrition cluster can have in realising this potential.

Finally, the case studies show a highly variable engagement in preparedness and longer-term coordination mechanisms – especially where a formal inter-agency standing committee (IASC) activation of the cluster is not needed or wanted. Engagement of the cluster with Scaling Up Nutrition (SUN) actors and mechanisms may provide an excellent opportunity to strengthen links between humanitarian and development planning. The new ENN programme of work to support the SUN Movement's knowledge management work in fragile and conflict affected states should ensure that ENN is able to fully capture this type of collaboration in the future. The new thematic areas on SUN opened on en-net should also, we hope, help cross-fertilise experiences between cluster/SUN mechanisms (for example, see www.en-net.org/question/2485.aspx) and develop connections between humanitarian and development practitioners.

A final word on Field Exchange itself. As you'll have noticed, the size of our print edition has grown over the last couple of years (issue 24 was just 28 pages!). This reflects, no doubt, the appetite to share and learn from each other and the breadth of programming and research now relevant to nutrition. However, we do need to consider what is manageable to sustain (in terms of resources) and digest (for our readership). So over the coming months, we'll be looking to innovate a little on how we deliver Field Exchange content to you, such as selected content for print, online editions, changes in format, etc. We'll contact those of you who have shared your email addresses for feedback and welcome unsolicited suggestions anytime; make sure your contacts are up to date (or add them) at: www.en-net.net/subscribe/fex

Jeremy Shoham & Marie McGrath
Field Exchange Co-editors

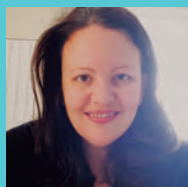


International Medical Corps training in Samburu Country, Kenya

IMC, Kenya, 2014

Enabling low-literacy community health workers to treat uncomplicated SAM as part of community case management Innovation and field tests

By Casie Tesfai, Bethany Marron, Anna Kim and Irene Makura



Casie Tesfai is a Nutrition Technical Advisor at the International Rescue Committee in New York, where she provides global technical support to IRC's nutrition programmes and leads work on the integration of nutrition into

integrated community case management (iCCM).



Bethany Marron is a Nutrition Specialist at the International Rescue Committee in New York, where she provides technical programme and research support to IRC's nutrition programmes worldwide.



Anna Kim is a Communications Officer at the International Rescue Committee in New York, where she supports the communications and advocacy work of the health unit.



Irene Makura is the Nutrition Coordinator at the International Rescue Committee in South Sudan, where she provides technical support to IRC's emergency and recovery nutrition programmes. She has experience

in Zimbabwe, Nigeria and South Sudan.

The authors would like to acknowledge the valuable contribution of the following individuals and donor in this process: IRC South Sudan: Stephen Epiu, Stanley Anyigu, David Maluak Kuol, James Kon Kon, John Akuei Deng, Santino Anyuon Arop, Fatuma Ajwang, Katja Ericson, Kimberly Bennett, Flavia Aber and all of the CHWs who gave so much of their time and dedication; IRC Mali: Marie Biotteau, Goita Ousmane, Ibrahima Siby, Mohamed El Moctar; IRC Niger: Pierrot Kalubi Balonda, Jacques Maurice Ousmane; IRC Chad: Franck Ntalaja Philomene Ndeortolna; IRC New York: Hannah Taylor, Yolanda Barbera Lainez, Austin Riggs; Quicksand: Amey Bansod, Kevin Shane, Avinash Kumar, Ayush Chauhan; Brixton Health: Mark Myatt. This project was funded with UK aid from the UK government.



Photo 1 An IRC iCCM CHW providing home-based treatment in South Sudan

Location: South Sudan

What we know: Coverage and access to acute malnutrition treatment services remains inadequate. Experiences from iCCM show that, with support, low-literate community health workers (CHWs) can manage pneumonia, malaria and diarrhea.

What this article adds: The International Rescue Committee (IRC) is developing and piloting tools to enable low-literacy CHWs to treat severe acute malnutrition (SAM) without complications. This has involved simplification (e.g. only MUAC used for admission and to monitor progress); innovation (e.g. visual materials developed by a specialist design agency); alignment with iCCM protocols (e.g. triage, anti-malarial protocols, symbols for gender and referral); and field tests, most recently in South Sudan. Key low-literacy challenges have been how to simplify the SAM treatment protocol; how to enable admission, follow-up, discharge, correct RUTF dosage and monitor treatment; and how to identify individual children on return. The tools have been well-received by CHWs. A final field test will inform a finalised toolkit. Collaboration with other agencies interested in piloting is welcome. A feasibility acceptability trial in 2016 and a randomised control trial of SAM (iCCM v CMAM (Community-Based Management of Acute Malnutrition) approach) is planned for 2017.

Low access and coverage for the treatment of acute malnutrition has been as persistent and perplexing as it is unacceptable. The main barriers of distance and high opportunity costs mean that a new approach to transform hard-to-reach services is most needed. (Puett, Hauenstein Swan & Guerrero, 2013). The child health community, through the integrated community case management (iCCM) of childhood illnesses strategy, has improved access to treatment for pneumonia, diarrhea and malaria by enabling the provision of treatment outside traditional health facilities through a large network of community

health workers (CHWs) (Bryce, Friberg, Kraushaar et al, 2010; Schellenberg, Victora, Mushi et al, 2003; Victoria, Wagstaff, Schellenberg et al, 2003). Similarly, since 2014, the International Rescue Committee (IRC) has been exploring a treatment algorithm and tools that would empower low-literate providers to bring treatment for severe acute malnutrition (SAM) without complications directly to the villages of malnourished children. Our journey has included countless patient registers, dozens of modified mid-upper arm circumference (MUAC) tapes, and partnerships with CHWs, designers, and experts in nutrition and iCCM. A year later, we

have the results of the third and most recent field test in South Sudan. The IRC believes providing treatment for acute malnutrition outside the facility is possible, but understands that we have a lot to learn about what works.

Strong evidence demonstrates that low-literate CHWs can identify and correctly treat most children who have pneumonia, malaria and diarrhea when they are trained on simplified guidelines, supported with supervision, and provided with an uninterrupted supply of medicines (George, Menotti, Rivera et al, 2009; Yeboah-Antwi, Pilingana, Macleod et al, 2010). Some adaptations that have been introduced do not require literacy or numeracy. For example, to assess fast breathing, CHWs count chest in-drawing using colour-coded beads and timers to identify pneumonia and treat it with colour-coded drug packets of amoxicillin designated for infants or toddlers.

We want to extend these successes to nutrition by enabling low-literacy CHWs to treat SAM without complications. While the potential is vast, there are no examples of such integration that both adhere to the globally accepted guidelines for the treatment of SAM (including collection of performance indicators) and do so through low-literate CHWs (often because of literacy and numeracy requirements). The IRC believes that the integration of SAM without complications into iCCM, like iCCM, requires simplifications of the treatment algorithm and development of tools for low-literacy providers.

The IRC has been developing and field-testing these low-literacy tool prototypes in Mali, Chad, South Sudan and India since 2015. Recently in 2016, the IRC completed the third field test in South Sudan. During that field test, the IRC nutrition and iCCM teams, along with Quicksand (a human-centered design firm that supported IRC in the design and development of prototypes and field-testing with end-users), worked with 30 female, low-literate iCCM CHWs

of varying ages and experience from Aweil South County, Northern Barh El Gazal state (iCCM CHWs in South Sudan are known as Community Based Distributors. In IRC's iCCM programme, there is one CHW per 50 households. In Aweil South, IRC supports a network of over 600 CHWs. There is one CHW monitor per 15 CHWs who provides routine supervision, drug restocking and is in charge of monthly reporting.) The process focused on capturing the end-user's perspective. Each group of CHWs was trained on each of the prototypes and participated in three rounds. During each round, they practiced using the tools and were observed by the IRC and Quicksand team. At the end of each round, CHW feedback was solicited on ease of use of the tools. For two rounds, CHWs worked with children enrolled in the outpatient therapeutic programme. Based on feedback from each round of CHW testing, revisions were made to the tools and applied in the subsequent rounds of testing. This process was repeated until the end of the field test.

This article outlines the key questions and answers that have emerged while developing low-literacy tools, the prototypes that were developed and field-tested, and the results of the third and most recent field test in South Sudan.

I. How can the SAM-treatment algorithm be simplified for administration by CHWs outside the health facility?

There are several areas where iCCM treatment overlaps with SAM treatment without complications, as shown in Figure 1. As part of the iCCM protocol, CHWs are already trained on how to take MUAC and check for bilateral pitting oedema. They also routinely check for 'danger signs,' which are very similar to the SAM protocol assessment for medical complications.

In the **assessment phase**, the appetite test will be the only new introduction for CHWs in

the iCCM programme. Due to low-literacy, this will be a MUAC-only programme; weight and height will not be introduced for admission purposes. For **admission**, we propose that a red MUAC (<11.5cm) with no danger signs and a good appetite will be treated by the CHW. **Follow-up** will be continued by MUAC and discharge will be by attaining green MUAC (>12.5 cm), which is in line with global recommendations. For now, oedema will be considered a danger sign and CHWs will refer. CHWs will also immediately refer any child with a MUAC below 9.0 cm as a critical case. The only drug that will be introduced is albendazol, since CHWs are trained and equipped with amoxicillin and anti-malarials. CHWs will also be trained on how to give ready-to-use therapeutic food (RUTF) using a dosage scale described in Figure 1.

II. What tool can enable SAM treatment admission, follow-up and discharge by low-literate CHWs?

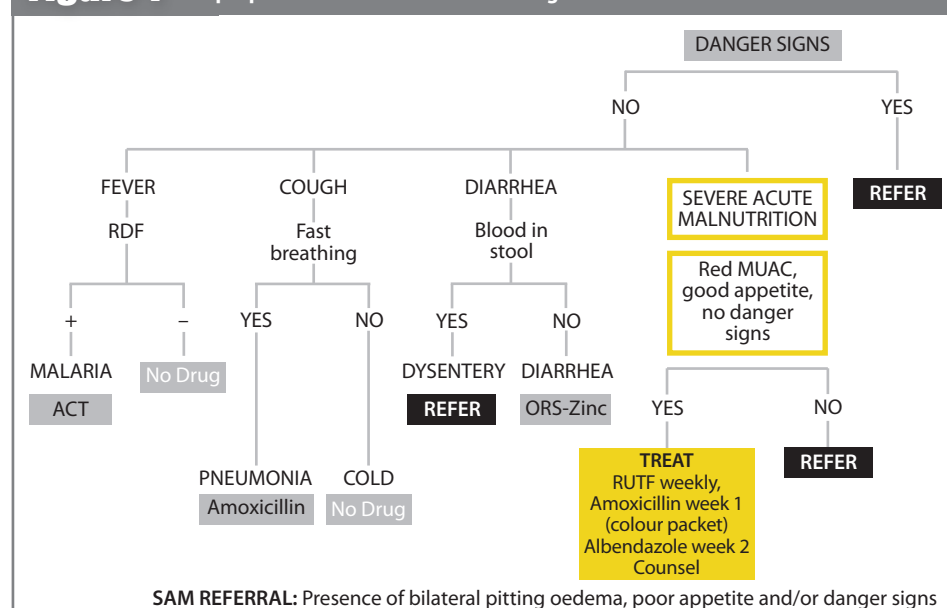
A study by Binns, Dale and Hoq et al demonstrated that changes in weight and MUAC occur similarly over the continuum of treatment and particularly during illness, introducing the possibility that MUAC could be used to follow-up children as an alternative to weight. (Binns, Dale, Hoq et al, 2015). The authors also concluded that further research would be necessary to develop additional tools that enable monitoring of children undergoing SAM treatment by MUAC as the sole anthropometric measure. Our work aimed to develop such a tool as well as tackle the challenge of low-literacy, which increases the difficulty of monitoring admission, follow-up and discharge as well as MUAC progression or regression during follow-up.

Process

Initially, we developed a wide longitudinal MUAC that could be used throughout treatment, a concept based on early work on the MUAC tape from Alfred Zervas (Zervas, 1975). Every week, CHWs would mark the tape and connect the dots, as shown in Figure 2. One MUAC tape would be assigned to one child. A box was added with two columns to track visits (left) and absences (right) in order to determine defaulting. Several prototypes of this were developed and field-tested, but it was found to be too difficult for CHWs to connect dots and interpret the direction of the line. Also, the tape was too wide to find the mid-point of the upper arm and we faced cost issues; it was going to be difficult and expensive to find a supplier to cut these new, durable tapes, which also required special pens for marking.

We reverted to the standard MUAC tape size for our second prototype by creating a colour-coded follow-up box where CHWs could place a dot in the corresponding weekly MUAC reading (absences would be inserted in the bottom row), as shown in Figure 3. This, too, was difficult to print and write on, so the follow-up box was moved onto a patient register with the goal of

Figure 1 The proposed iCCM + SAM treatment algorithm



eliminating individualised MUAC tapes and creating one register sheet per child to track follow-up.

Another MUAC prototype was developed that used a 'slider' to hold the measurement spot on the MUAC tape after enclosing a child's upper arm, as shown in Figure 4. The tape and slider would then be placed in an outline of the MUAC on the paper register. A line was drawn where the slider had been and then examined for which colour zone it fell into, as shown in photo 2. While slightly complicated, the design allowed CHWs to determine the direction (improvement, stationary or deterioration) of the MUAC measurement with the same plotting and visual interpretation technique as the preceding prototypes.

Solution

All of these prototypes proved too difficult and confusing for low-literate CHWs, which led to our most recent prototype, as shown in photo 3. We reverted back to a standard MUAC tape and added a new dark red zone, modeled after the dark red shade that signals a danger sign for iCCM in South Sudan. Since most of our programme data shows that most children with a MUAC less than 9 cm are also referred to the Stabilisation Centre, we felt that this change to the tool and algorithm would ease the decision-making burden of the CHW for these critical cases. Since CHWs are already trained to take MUAC for referral, they had no problem doing so correctly. Across the board, CHWs preferred the inclusion of dark red, finding it easy to remember as a 'danger sign' requiring referral. Of the 30 CHWs, no one incorrectly reported the wrong colour when they took the MUAC and no one reported any difficulty telling the difference between the two red zones or remembering that dark red was a danger sign.

What we still don't know

We are still confronting the issue of following up progression and regression. For example, it could be difficult to determine if a child is stationary, improving or deteriorating when recording the colour red for multiple consecutive weeks. The protocol requires an investigation after three consecutive visits without improvement. Since we found the danger-zone MUAC tape was perfectly feasible with two shades of red, we are exploring another prototype with a third red zone, as shown in Figure 6. Dark red would be less than 9 cm, standard red would be from 9 to 10.5 cm and another lighter red would be from 10.5 to 11.4 cm. This would mean a CHW could observe progression by moving from standard red to light red. However, this does not completely solve the problem, so more work is necessary.

III. How will low-literate CHW providers determine the correct dosage of RUTF?

Process

Determining daily dosage. In order to ensure CHWs could easily determine the correct dosage of RUTF each week, we first simplified the standard RUTF look-up table. For the look-up table, we rounded up where there were half sachets to create fewer dosage 'zones', as shown in Table 1.

Next, we developed a corresponding colour-coded scale with shapes to represent a daily dosage derived from the simplified RUTF look-up table. Using the standard Salter scale, we created a decal to designate each dosage zone. When a child was weighed, the scale needle would fall into a colour and shape zone wherein

Figure 2 The original longitudinal MUAC



Figure 3 The second longitudinal MUAC prototype



Figure 4 The 'slider' MUAC system

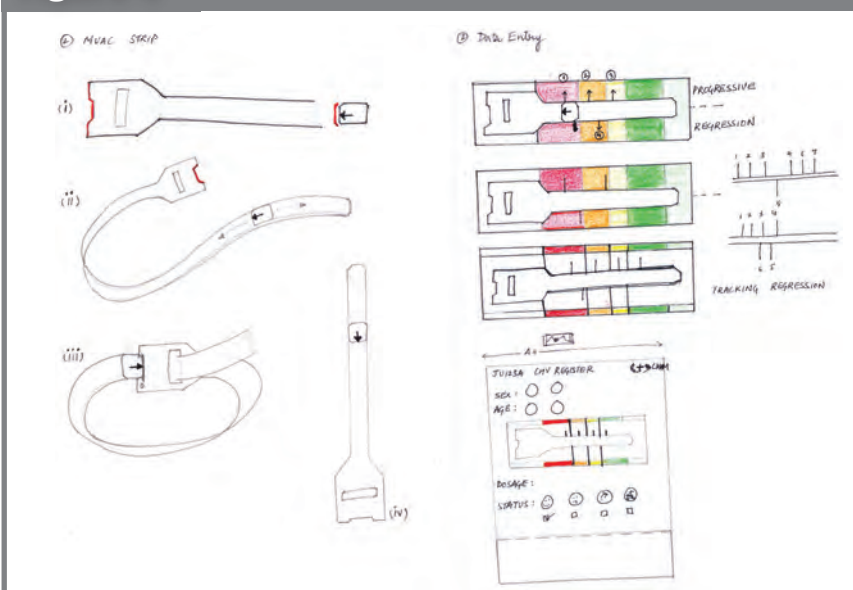
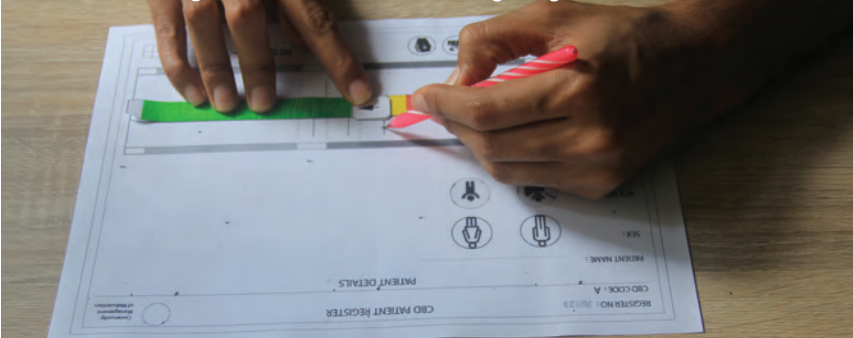


Photo 2 Marking the colour of the MUAC reading using the 'slider' MUAC



CHWs could visualise the shapes as the daily dosage. Since Salter scales are widely used and available in nutrition programming, the card was developed to fit inside the plastic cover (there are two screw holes on the card where it is fastened in place).

Calculating weekly dosage. The next issue we aimed to address was how to ensure CHWs correctly calculated the weekly dosage of RUTF. Initially, the IRC nutrition programme staff developed a prototype of a piece of local cloth with seven squares, so that after determining the daily dosage from the scale, the CHW could make seven piles of whatever quantity s/he determined. Quicksand built on this idea and developed an RUTF bag with seven pockets (called the RUTF StorCal) which enabled CHWs to calculate the correct weekly quantity (shown in action in photo 6). This may also help caretakers remember the daily dosage for their child. If programme resources allow, this presumably could be taken home and used there. Each pocket is designed to fit up to five sachets of RUTF and seals with Velcro. There is also a plastic window where the patient card can be inserted.

Solution

Field tests showed that using colour on the RUTF scale did not add value since CHWs relied only on counting the shapes. Previous field tests revealed that the scale with the least amount of detail was easiest to understand, as shown in photo 5, which was also field-tested in South Sudan. Both the updated RUTF scale and StorCal were met mostly with applause from CHWs in each of the field sites when these were presented, and very few mistakes were made.

Initially, there were a few occasions where CHWs were unsure of the daily quantity when the needle fell on the line between two zones. After being trained to round up, they made few mistakes.

The only other mistake that a few CHWs made concerned the ‘five’ zone. Since the cluster of dots was around 20kg, when the needle fell anywhere before that, as shown in photo 11, some CHWs said “four”, since the needle fell close to the four zone and did not reach the cluster of five dots.

During the feedback session, some CHWs said the lines were not dark enough, but that they could understand that everything between the lines was for that quantity. Since most children do not exceed 15kg, we decided to test a version with the cluster of five dots around 15kg and with bolder lines, as shown in Figure 7. After being trained on the changes, CHWs were able to correctly identify the daily quantity of children who fell in the ‘five’ zone at all different weights. We also discussed blacking out the 0-4 kg zone, since the national protocol in South Sudan requires any child less than 4 kg to be referred. For the StorCal, the only change suggested by CHWs was to add longer strips of Velcro for each pocket; they were afraid the RUTF might fall out.

IV. How will low-literate CHWs monitor treatment from admission to discharge?

The patient register needed to be able to: 1) track a patient’s progression/regression over time; 2) log the course of treatment provided; 3) include a calculation of performance indicators; and 4) provide a method of providing a connection between the patient and the record for that patient, since CHWs may not be able to write the name of the child. The register was by far the most challenging tool. It underwent significant revisions and retesting based on CHWs’ difficulties using it and suggestions for improving it. Rigorous testing allowed us to develop appropriate icons and formats to document the sex and age of the child, their weekly status (including whether they defaulted or were non-respondent), and whether they were discharged as cured or died.

Process

Figure 8 shows the first version that was tested in South Sudan. The register will be explained below by each section: sex and age, weekly follow-up (MUAC/RUTF), discharge status and the counterfoil ID system.

Sex and age: The icons to show sex were not well understood since they lacked facial features and did not have attributes of a girl or boy. CHWs were not able to immediately tell the difference between a boy and



Photo 3 CHWs being trained on the new MUAC with dual-red zones

Photo 4 A CHW taking the MUAC of a child using the new, dual-red zone, MUAC tape

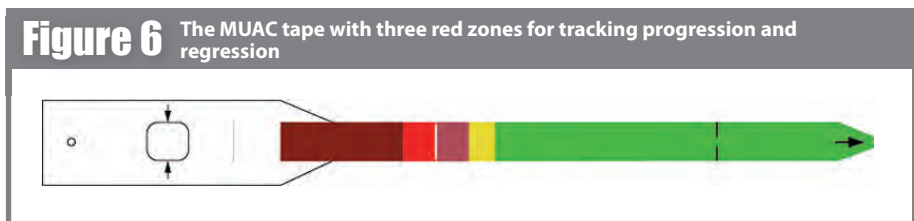
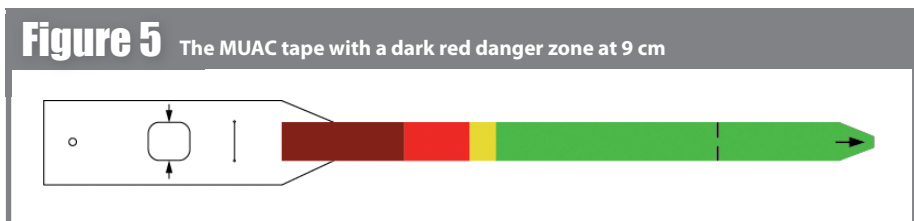


Table 1 The RUTF look-up table with simplified dosage zones

Child's weight	200 kcal/kg # sachets per day	Rounded-up
4.0 – 4.9	2	2 per day (14 per week)
5.0 – 6.9	2.5	3 per day (21 per week)
7.0 – 8.4	3	3 per day (21 per week)
8.5 – 9.4	3.5	4 per day (28 per week)
9.5 – 10.4	4	4 per day (28 per week)
10.5 – 11.9	4.5	5 per day (35 per day)
≥12	5	5 per day (35 per day)

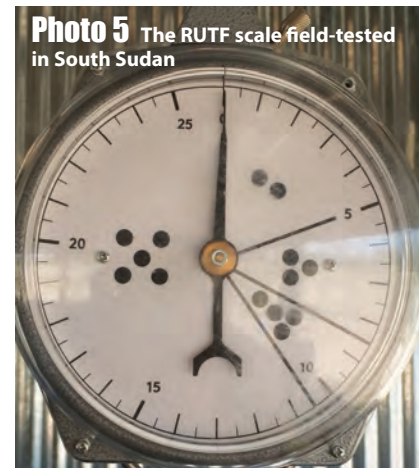


Photo 5 The RUTF scale field-tested in South Sudan



Photo 6 The RUTF StorCal (unfurled)

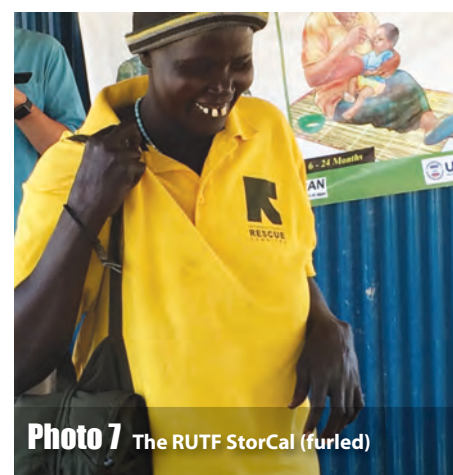


Photo 7 The RUTF StorCal (furled)

girl and felt they resembled other things, such as a cow or a house.

For age, we initially included three categories for infants (6-11 months), toddlers (12-23 months) and children (24-59 months). These were very confusing and the ages associated with each icon as reported by CHWs varied widely. Some thought the icons did not look like children at all. To align with iCCM, we then decided to include only two age categories: infant (6-11 months) and toddler (12-59 months).

CHWs also suggested that we incorporate sex and age icons from the iCCM register, since CHWs were already trained to recognise these. When we used the sex and age icons from the iCCM register, CHWs were able to easily recognise the difference between boys and girls and infants and toddlers.

Weekly follow-up: CHWs had relatively few problems entering the colour of the MUAC every week and the number of RUTF sachets given, as shown in the photo 13. Some CHWs forgot to enter each new MUAC reading on a new line, so this will need to be addressed in training. They improved the more they practiced.

To remind CHWs to drop to the next line if a child is absent, they were asked to strike a line through the entire row, as shown in photo 14. This helped them to remember to start on a new line in the case of patient absence.

In testing revisions that might improve the quality of reporting, we found that CHWs preferred a picture of the MUAC tape at the top of the weekly follow-up and a photo of a sachet of RUTF above the dosage column. CHWs also preferred filling in circles for RUTF rather than a rectangle.

To remind CHWs that they would give amoxicillin on week one and albendazole (according to the South Sudan national protocol) on week two, we added an image of the drugs at weeks one and two. Those images were also added below the infant and toddler icons to remind them of the dosage according to age. The icons used for albendazole still need to be tested with CHWs.

Since an appropriate length of stay for recovery is less than eight weeks, the IRC team decided to add a reminder at eight weeks so that a child remaining in red could be investigated. The CHW monitor will need to be involved in children who are not recovering well and help decide the course of action. We also added a bar after 16 weeks as a reminder of the non-respondent criteria. These changes are shown in Figure 9.

Discharge status (performance indicators)

The discharge status icons underwent several iterations. It required five icons: recovery, death, defaulting, non-response and transfer. Like the age and sex icons, CHWs reported that the icons lacked facial features. Some CHWs asked how a person could not have a neck and shoulders. Because Quicksand designers were in the field with us, we were able to continually mock up and test alternative icons until we felt confident that they were widely understood



Photo 8 A CHW weighing a child to determine the daily dosage of RUTF



Photo 9 A CHW filling each of the seven pockets of the StorCal with the daily dosage of RUTF



Photo 10 The CHW RUTF scale and StorCal training session

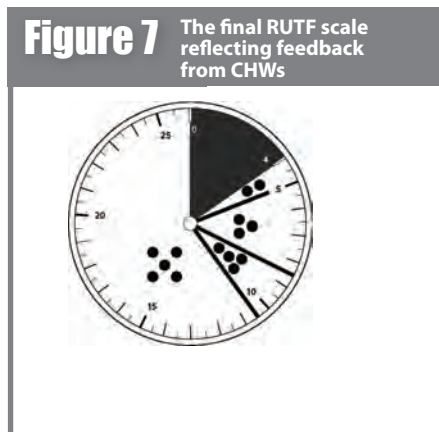


Figure 7 The final RUTF scale reflecting feedback from CHWs

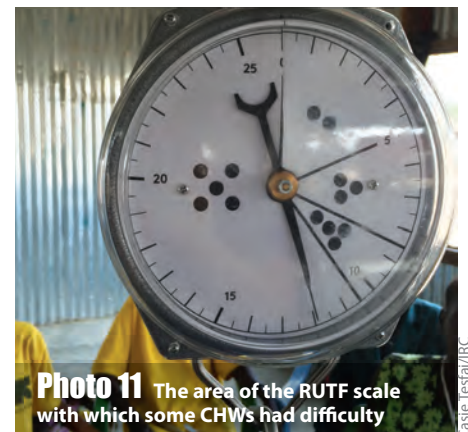


Photo 11 The area of the RUTF scale with which some CHWs had difficulty

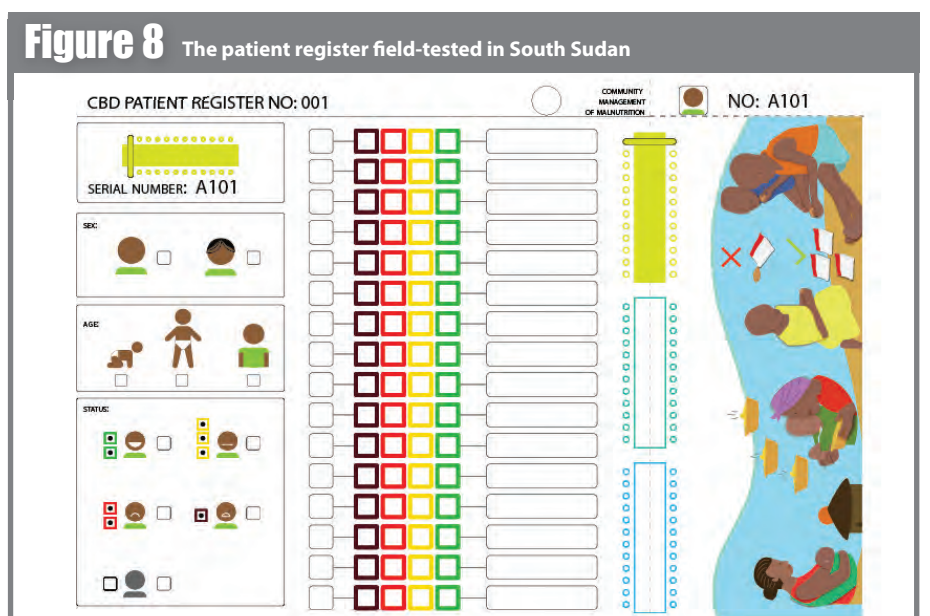


Figure 8 The patient register field-tested in South Sudan

by CHWs.

Recovery. CHWs preferred a smiling child with facial features, as shown on the right-hand in the image below. The final recovery icon preferred by CHWs was a smiling child with two green dots (since the criteria for recovery is two consecutive visits >12.5 cm).

Mortality. The icon for mortality proved to be the most challenging, since mortality is a sensitive issue. Based on suggestions from CHWs, we tested a coffin, a cross, a coffin with a cross, a tearful mother and a deceased person covered with a cloth. One CHW told us: “These are really sad. Why does it have to be a person? If I saw something like a dead bird, I wouldn’t feel sad, but I would know that it means death.” We then created a ‘dead bird’ icon and tested it with CHWs, as shown in photo 17.

The dead bird icon was preferred by many CHWs, who found it amusing rather than sad. Some CHWs did not immediately know what it was, but did not have a negative reaction when it was explained. We felt that most CHWs with training would remember that the dead bird icon represented mortality, and that it was most culturally appropriate.

Defaulting. Defaulting, according to the national protocol in South Sudan, is comprised of three consecutive absences. This icon was developed to show three consecutive absences with lines drawn through the rows. Drawing the line all the way through the row tended to remind CHWs of that. CHWs did not seem to have difficulties with this icon and preferred the image shown in Figure 10.

Non-Respondent. The icon for non-respondent was also slightly difficult. Since non-respondent is essentially a child who doesn’t recover, we created a ‘sad child.’ CHWs suggested that we make the child look more malnourished so they could remember this child is still malnourished and hasn’t yet recovered.

Transfer. The icon for transfer was initially a very simple health facility; however CHWs did not easily recognise it. They suggested that we use the iCCM referral icon as shown in Figure 11. Although we initially felt it was too detailed and difficult to see at small size, all CHWs preferred the iCCM icon since they were already trained on it and understood it. We therefore incorporated the icon from the iCCM register for referral.

What we still don’t know

The register will continue to be a work in progress, particularly as we explore more options to track progression and regression. We will continue to field test and make revisions based on CHW feedback.

V. How does a CHW identify a child for follow-up if the CHW cannot write the child’s name?

We recognised the need to enable a CHW who cannot read or write to link record and child correctly. To address this problem, Quicksand developed a counterfoil ID system. This system would provide a unique identifier on each patient register sheet and the patient card (an earlier prototype is shown in



Photo 12 CHWs providing feedback on the age and sex icons

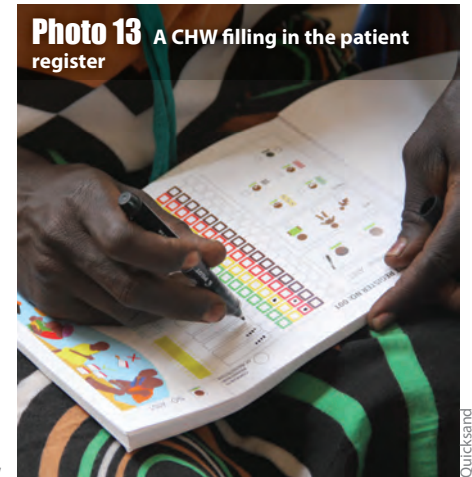


Photo 13 A CHW filling in the patient register

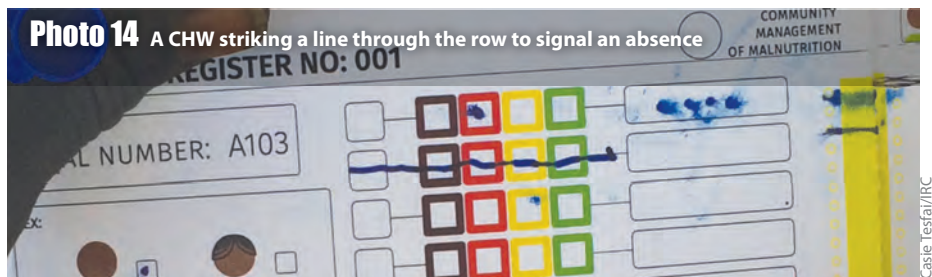


Photo 14 A CHW striking a line through the row to signal an absence

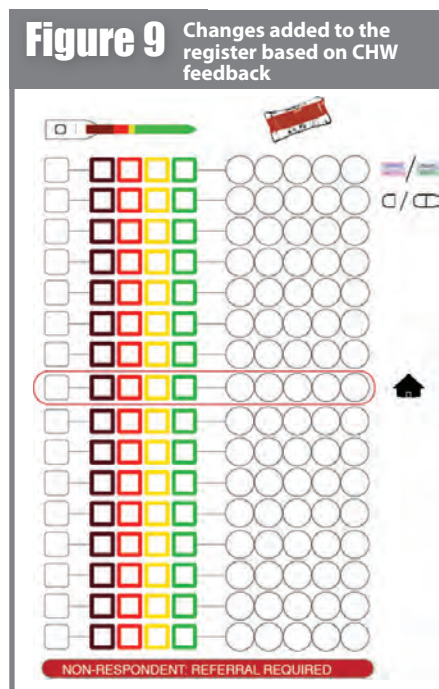


Figure 9 Changes added to the register based on CHW feedback



Photo 15 CHWs providing feedback on the register revisions

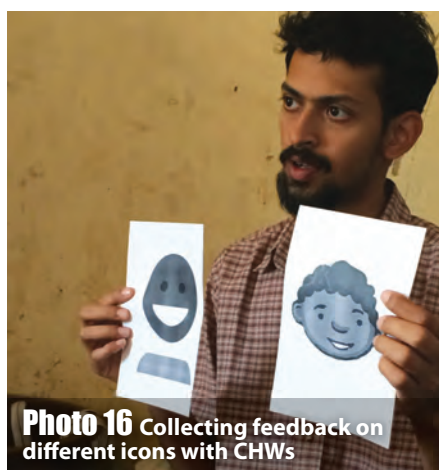


Photo 16 Collecting feedback on different icons with CHWs



Photo 17 Collecting feedback on the ‘dead bird’ icon with CHWs

photo 18). When the patient card is torn off and given to the caretaker, she would return with this card and the CHW would be able to match it to the correct record in the register.

Process

Several prototypes were developed and tested. The system field-tested in South Sudan required the CHW to draw a line through two circles in a coloured box and then match up the coloured boxes and the line, as shown in photo 19 below. There were 12 rows of circles per box and three colour options, which meant 36 pages per register.

We also tested a redundant ID system of matching an alphanumeric code with the register in case CHWs lost their card. This small alphanumeric code could be kept in the plastic window of the StorCal to serve as a back-up identification system if the patient card gets lost. It was clear early on that CHWs were unable to match the alphanumeric code with precision.

CHWs also struggled with matching the counterfoil. Some CHWs forgot to drop down to the next line for each subsequent page. Instead, they drew the line in the same location on each page. Because the alphanumeric code was torn off the patient card, this also resulted in uneven pages that confused CHWs when trying to match the counterfoil, as shown in photo 22. They tended to match the lines, but not the boxes.

It was decided that the alphanumeric ID system was probably unnecessary and only made the system more complex. The IRC team therefore decided that we would omit the alphanumeric ID system but would place the patient card inside the plastic window of the StorCal to try to prevent it from being lost.

Solution

In order to develop an easier system for the counterfoil, we tested the ability of CHWs to match shapes familiar to them, like cows, mud huts and the IRC logo. We tested black and white images of each icon with three to five different permutations; more permutations would allow for more register pages. To test the ease of matching shapes, each CHW was given half and chose her match among other pieces, as shown in photo 23. Overall, this system proved much more feasible. Some CHWs made a few mistakes initially. **Once they were told to match both the shapes and the colours, very few made any errors. CHWs unanimously preferred the new counterfoil system.**

Key messages were also added to the patient card to serve as a job aid for the CHW to explain how to give RUTF to the caretaker. These icons were tested and revised based on CHWs' ease of understanding. Like the age and sex icons, they were aligned with images CHWs have already been trained to recognise.

What we still don't know

The only drawback of using shapes as opposed to different coloured boxes as placeholders is increased difficulty of knowing where to turn to in the register. Quicksand is currently exploring whether it is possible to combine coloured placeholders with

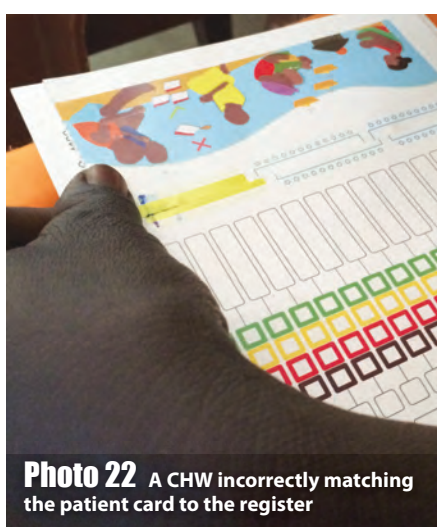
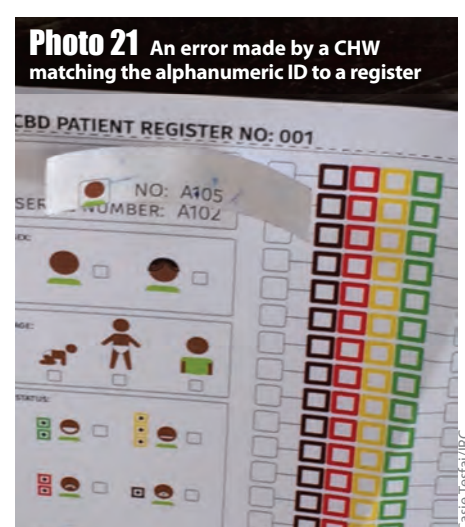
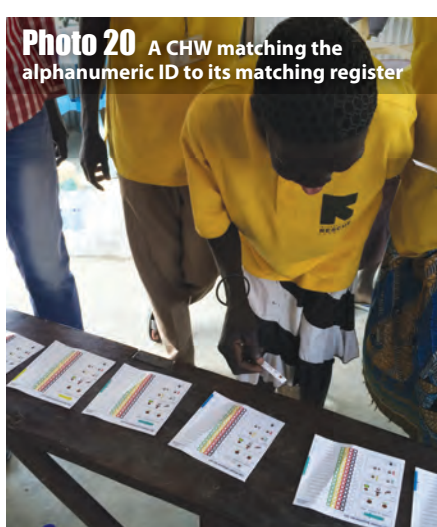
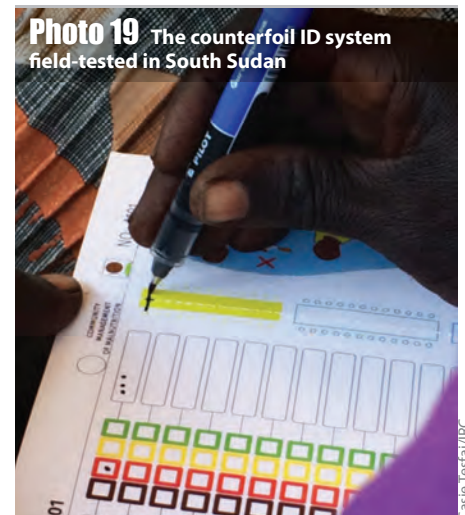
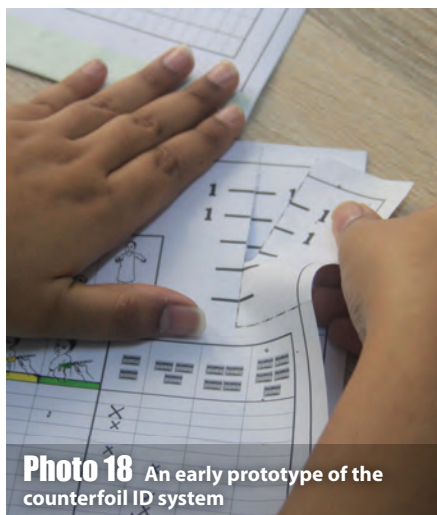
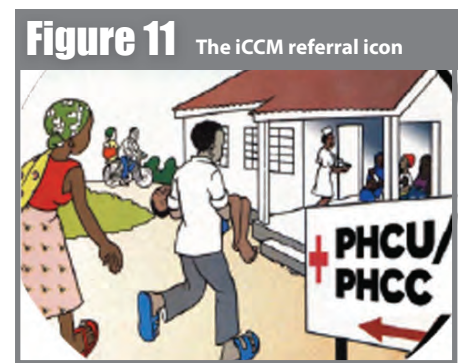
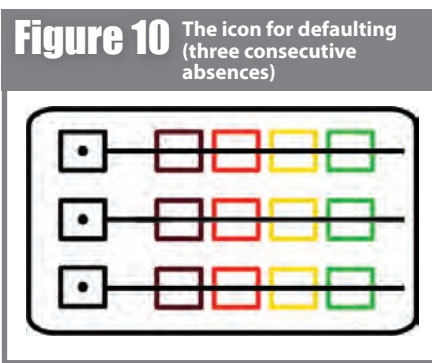


Figure 12 The new counterfoil prototypes that will be field-tested

CBD PATIENT REGISTER NO: 001

PATIENT NAME: _____

SEX: Male Female

AGE: 0-5 6-11 12-17 18+

AMOXICILLIN: Yes No

ALBENDAZOLE: Yes No

NON-RESPONDENT: REFERRAL REQUIRED

Grid of colored boxes (Red, Yellow, Green, Blue) and a grid of circles.

Counterfoil strips:

- Strip 1: House icon
- Strip 2: Cow icon
- Strip 3: Person icon
- Strip 4: Person with cow icon

shapes. A fourth option of having only coloured boxes that gradually get bigger (then change colour) is a potential solution (see Figure 12, right-hand side).

These new counterfoils will need to be field-tested again once printed up in the register to determine which system is most feasible for CHWs. We also may need to explore an alternative option in case the caretaker loses the patient card.

Reflections and next steps

If asked whether low-literate CHWs could treat severe malnutrition two years ago, we may have thought that low-level providers might operate a poorly run programme, given the complexities of the CMAM protocol.

Ask us that question today and we immediately recall the faces of the eager, invested and excited CHWs that joined our efforts. We remember the small, continual victories advanced by an unlikely team of colleagues committed to the same goal, from nutrition experts to iCCM experts, CHWs and designers, and we remember those who encouraged us to keep going. Mostly,

we feel proud that we've come this far and can say with confidence that this is very possible.

But the work is far from over.

Our plan is to conduct another round of field-testing so that we can make final decisions on the toolkit. We want to start collaborating with other agencies who are interested in piloting the tools and informing the revisions. In 2016, we hope to conduct a feasibility and acceptability trial to determine how well CHWs use these tools to treat SAM children without complications. We hope to be able to conduct a randomised controlled trial on the impact (quality, coverage, cost-efficiency) of SAM treatment as part of iCCM compared to the standard of care (CMAM) in 2017.

In the nutrition community we have long known that access and coverage must change. Increasingly, everyone has recognised that scaling up more of the same will not work. We believe this is one way to start scaling differently. The potential implications of applying a truly community-based model to malnutrition are enormous. Thousands of children could get access

to life-saving treatment without leaving home. We have an opportunity to improve the survival, health and development for an entire generation. This doesn't mean we are not aware of the numerous challenges that still require solutions, but it's hard not to be inspired when we think about the immediate response of the very CHWs who perhaps understood better than any of us the potential implications of this work: "When can we start?"

For more information, contact: Casie Tesfai (casie.tesfai@rescue.org)

References

- Binns P, Dale N, Hoq M, Banda C, Myatt M. Relationship between mid upper arm circumference and weight changes in children 6-59 months. *Archives of Public Health* (2015) 73: p 54.
- Bryce J, Friberg IK, Kraushaar D, Nsona H, Afenyadu GY, Nare N, Kyei-Faried S, Walker N, 2010. LiST as a catalyst in program planning: experiences from Burkino Faso, Ghana, and Malawi. *Int J Epidemiol* 39: pp i40-i47.
- George A, Menotti EP, Rivera D, Montes I, Reyes CM, Marsh DR, 2009. Community case management of childhood illness in Nicaragua: transforming health systems in underserved rural areas. *J Health Care Poor Underserved* 20: pp 99-115.
- Puett C, Hauenstein Swan S, Guerrero, S (2013). Access for All, Volume 2: What factors influence access to community based treatment of severe acute malnutrition? (Coverage Monitoring Network, London, November 2013).
- Schellenberg JA, Victora CG, Mushi A, de Savigny D, Schellenberg D, Mshinda H, Bryce J, 2003. Inequities among the very poor: health care for children in rural southern Tanzania. *Lancet* 361: pp 561-566.
- Victoria CG, Wagstaff A, Schellenberg JA, Gwaitkin D, Claeson M, Habicht JP, 2003. Applying an equity lens to child health and mortality: more of the same is not enough. *Lancet* 362: pp 233-241.
- Yeboah-Antwi K, Pilingana P, Macleod WB, Semrau K, Siazeele K, Kalesha P, Hamainza B, Seidenberg P, Mazimba A, Sabin L, Kamholz K, Thea DM, Hamer DH, 2010. Community case management of fever due to malaria and pneumonia in children under five in Zambia: a cluster randomised controlled trial. *PLoS Med* 7 e1000340.
- Zerfas, A. The insertion tape: a new circumference tape for use in nutritional assessment. *Am J Clin Nutr* 1975, 28 pp 782-787.



Photo 24 CHWs participating in the training session



Location: Kenya

What we know: The relationship between stunting and wasting in children has been poorly investigated.

What this article adds: A secondary analysis of SMART survey data investigated socio-economic and health-related risk factors associated with stunting, wasting and both combined in 227 children aged 6–23 months in a poor, pastoralist Kenyan community. Stunting prevalence was 28.19%; wasting prevalence was 8.8% (WHZ) and 1.32% (MUAC <11.5 cm). In univariate logistic regression analysis, (lack of) hand-washing at four critical moments, having had fever or malaria in the past two weeks, and child age, were associated with stunting. In multivariate logistic regression analysis, no variable was significantly associated with stunting. Having access to toilet facilities was weakly associated with wasting. Children with concurrent wasting and stunting were significantly more likely to come from a household without any livestock ownership ($p=0.03$). The correlation between stunting and wasting was low at 5%. The analysis was limited (cross-sectional data does not capture seasonal trends; this secondary data analysis may have lacked statistical power). The authors recommend programme-specific data and measurement-related improvements to SMART to enable more meaningful analysis.

Background

While the prevalence of stunting and wasting in children under five has been decreasing globally over the past two decades, the 2013 Lancet series of Maternal and Child Nutrition estimated that stunting still affected at least 165 million children and wasting still affected at least 52 million children under five years old in 2011. United Nations Children's Fund (UNICEF), World Health Organization (WHO) and the World Bank estimated that in 2012, 36% of all stunting cases occurred in Africa, (UNICEF, WHO & World Bank, 2016) with East Africa facing the heaviest burden of stunting. (Black, Victora, Walker et al, 2013).

Wasting prevalence in Kenya at the time of programme launch was at 7% (KDHS 2010), with children aged 6–8 months having the highest prevalence (11%) (KDHS 2010). The prevalence of stunting among children under five was 35%, with children aged 18–23 months having the highest prevalence (46%) and children less than six months having the lowest (11%) (KDHS 2010). While stunting rates declined between 2000 and 2008 by approximately 17%, since then the prevalence has not changed substantially (KDHS 2010). With an estimated 2.1 million children under five years old being stunted in Kenya and wasting prevalence as high as 20% in one province in the country, the Kenyan Government initiated the High Impact Nutrition Interventions (HiNi), based on evidence from the Lancet Series on Maternal and Child Nutrition (2008) (MPHS, 2012). Eleven of the 13 recommended interventions were chosen by the Government as relevant to the country's nutrition challenges: breastfeeding promotion, complementary feeding promotion for infants after six months, improved WASH (water, sanitation and hygiene) practices, vitamin A supplementation for children, therapeutic zinc supplementation for diarrhoea management, deworming, iron-

folic acid supplementation for pregnant women, salt iodisation, multiple micronutrient fortification, prevention of acute malnutrition, and treatment of acute malnutrition.

The analysis presented in this article focuses on Samburu County, one of the poorest counties in Kenya and home to a semi-nomadic, pastoralist population. International Medical Corps has been supporting HiNi in Samburu County since 2011. The County is located in the Rift Valley region and is characterised by arid and semi-arid lands; suffering from unreliable rainfalls, droughts and floods, it is prone to malnutrition. Even after the implementation of the HiNi, stunting and wasting persist. The prevalent malnutrition issues and limited data on the impact of HiNi in the County led us to undertake further analysis of Standardized Monitoring and Assessment of Relief and Transitions (SMART) data from Samburu County, where these interventions have been implemented. We explored the relationship between stunting and wasting in what is one of the poorest counties in Kenya to disentangle this relationship and provide concrete recommendations to address both.

The relationship between stunting and wasting has been poorly investigated. Stunting and wasting are generally treated as two separate and distinct conditions in nutrition programming, policy, and funding streams (Khara & Dolan, 2014). While causes of wasting are clearer due to a larger body of research, a number of causes of stunting have also been identified in previous research. The two forms of malnutrition share many causes (see Figure 1) and can co-occur in the same country, region or even the same child. Wasting has, in fact, been identified as a potential risk factor for stunting.

The overall aim of this analysis was to identify socio-economic and health-related risk factors associated with stunting and wast-

Stunting and wasting in children under two years old in a semi-nomadic pastoralist population in Kenya

By Amelia Reese-Masterson, Masumi Maehara and Mark Murage Gathii



Amelia Reese-Masterson is Research Advisor in the Nutrition, Food Security and Livelihoods Unit at International Medical Corps. She has over six years' experience in applied maternal and child health

and nutrition research and programming. She holds an MPH from Yale School of Public Health, with a focus on nutritional epidemiology.



Mark Murage Gathii is Monitoring and Evaluation Officer for International Medical Corps, Kenya. He holds a Bachelor of Science in nutrition and has seven years' experience in nutrition assessments, including SMART and SQUEAC, and social research.

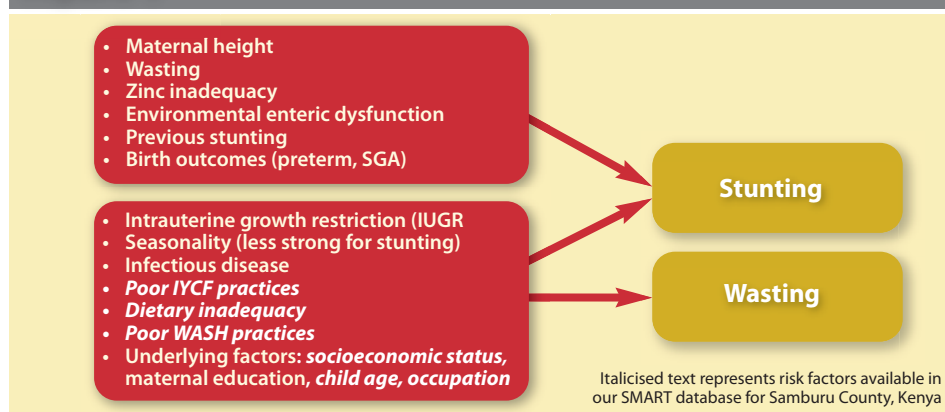
SMART and SQUEAC, and social research.



Masumi Maehara is Maternal and Neonatal Nutrition Consultant for United Nations Population Fund Somalia Country Office. She holds a Bachelor's degree in Public Health and International Relations and an MSc. in

Nutrition in Global Health from the London School of Hygiene and Tropical Medicine.

The authors acknowledge funding support from UNICEF, the technical support of the NIWTG, the Ministry of Health, Samburu County, and Philip James of the London School of Hygiene and Tropical Medicine for technical support.

Figure 1 Shared and divergent risk factors for stunting and wasting based on initial literature review

ing in children aged 6-23 months in the Samburu population. *Specific objectives* included:

1. To investigate factors (and effect size) associated with stunting, wasting and both combined;
2. To investigate the relationship between stunting and wasting; and
3. To provide evidence-based recommendations to inform nutrition programmes in this population/region.

Study methods

Data from a cross-sectional SMART nutrition survey, carried out by International Medical Corps in 2013, were used for a secondary data analysis. This SMART survey was conducted between 7 and 16 January 2013 among the semi-nomadic, pastoralist population in Samburu East and North districts. It assessed the effect of the HiNi programme on maternal and child health in Samburu. The survey questionnaire was adjusted to the Kenyan context using guidelines provided by the Nutrition Information Technical Working Group (NITWG), in partnership with the Ministry of Public Health and nutrition sector partners. Specifically, the survey captured anthropometrics of children aged 6-59 months, child mortality rate, infant and young child feeding (IYCF) practices among those aged 6-23 months, exclusive breastfeeding rates among infants under six months, maternal healthcare and child care practices, WASH, and demographic and household characteristics of the nomadic pastoralist population. It was conducted during the dry season. Data were collected by trained enumerators under the guidance of a team leader, entered by trained data entry clerks.

A two-stage cluster sampling methodology was used to sample participants in the original survey. The first stage involved cluster sampling based on probability proportional to population size of clusters. Villages were used as clusters. All the clusters and their population sizes were derived from the 2009 Kenya Census Report (KNBS, 2009). The second stage involved simple random sampling of households from each cluster. Households were identified by creating a list of all the households with the help of village guides. For the original survey, sample size was calculated based on the global acute malnutrition (GAM) prevalence of 21.5% in 2011 in Samburu, precision of 4.5, a design effect of 1.5, an average household size of 5.4 people, and an estimated non-response rate of 4%, which resulted in 36 clusters and 18 households from each cluster. For the purpose of this present analysis, only participants from

the original survey that met the eligibility criteria outlined below were included in the analysis.

The predictors of stunting (length-for-age z-score (LAZ) <-2) and wasting (weight-for-length z-scores (WLZ) <-2) were explored through a secondary data analysis. All analyses were adjusted for the complex survey design used during the SMART survey. For stunting, univariate logistic regression analysis was conducted to obtain unadjusted odds ratios. Variables identified to be associated with stunting ($p < 0.10$) were taken forward to multivariate logistic regression analysis. Child age, sex and occupation of the household head were forced into the final logistic regression model. Adjusted Wald tests were performed to investigate which variables were associated with stunting ($p < 0.05$). For wasting, the number of children with this condition was low, so using logistic regression was not appropriate. Instead, chi-squared tests were used to see the association with exposure variables and the significance level was set at 0.10. Since the Samburu are a pastoral population and pastoralists have been shown to be taller and leaner than sedentary populations, mid-upper arm circumference (MUAC) was also used as a substitute for WLZ to determine wasting prevalence. Correlation between stunting and wasting was explored using Pearson's correlation coefficient.

Findings

Of 227 children, 120 (52.86%) were boys. Median age was 17 months (IQR=11, 21 months). There was no difference between boys and girls in height or weight (p -values=0.37 and 0.24, respectively).

Household characteristics

More than half of households had six or more people living together; 83% were male-headed while 5% were single-parent households. Most households (81%) owned livestock and 69% were engaged in livestock herding. Regarding mothers/caregivers of children under five years, 57% were in their twenties and 5% were adolescents, while 13% were above 40 years old.

Water, sanitation and hygiene practices

Despite the fact that 74% of households obtained their water for drinking from potentially unsafe sources, 40% did not treat water before drinking. Those who treated water used various methods, including boiling, chemical treatment and use of traditional herbs. Only about 40% of households had access to toilet facilities. While 75% of mothers/caretakers reported using water and soap to wash their hands, 87% of caregivers did not

practice hand-washing at least one critical moment or more, such as before cooking or after cleaning the child.

Household dietary diversity and food security

Generally, dietary diversity was comparatively low at the household level in this population. The median dietary diversity score was three food items. Based on the rankings used in the original SMART survey, 55% of households had low dietary diversity (three or less food groups consumed), 40% had medium dietary diversity (four or five food groups consumed), and only 5% had high dietary diversity (six or more food groups consumed). Despite their pastoral lifestyle, 75% of the households identified purchased food items as their main source of food, while 10% identified their own livestock products as their main source of food. Ninety per cent of households normally ate two or more meals per day, while 10% ate only once a day. In the three months prior to the survey, 47% of households had received general food distribution.

Children's health

Kenya's Expanded Programme on Immunisation includes vaccination of children against polio, tuberculosis, measles, diphtheria, and pertussis (MPHS, 2011). In the present survey, BCG, measles vaccine and oral polio vaccine (OPV) status was assessed. Immunisation coverage was generally high, with BCG and OPV reaching more than 80%, which met the National Immunisation Programme target of at least 80% coverage (MPHS, 2011). Seventy-eight per cent of children were given vitamin A supplementation, whereas 48% received deworming medicines in the past year. In the two weeks prior to the survey, 34% of children experienced one or more diseases; however 66% of mothers/caregivers said they did not seek any medical help whenever their child was sick. Among those who did seek help, public clinics were the most common point of contact. Community health workers were not utilised at all and traditional healers were also not a main source of help.

IYCF practices

More than 90% of children were breastfed within one hour of birth. In the first three days after delivery, 74% of children were given only breastmilk, while 26% of them were given non-breastmilk fluids. Apart from one child, none of the children met minimum dietary diversity (consumption of four or more food groups). Their diet was characterised by high consumption of dairy products and low consumption of vegetables, fruits, cereals, tubers, roots and legumes. However, since 78% of household main source of food was purchased food instead of the products of their own livestock, children's dairy consumption may have been mainly sourced from purchased milk as well.

Stunting

Data for a number of factors that have been shown to be associated with stunting and wasting, such as maternal nutritional status pre-pregnancy, during pregnancy and after delivery; parental educational levels; and comprehensive socio-economic status were not available in the current dataset. Stunting prevalence in this population

Table 1 Association between risk factors and stunting: unadjusted and adjusted odds ratios (OR)

Variables	OR (95% CI)	P-value	aOR (95% CI)	P-value (Wald)
Hand-washing at critical moments				
No				
Yes	0.47 (0.21-1.07)	0.07*	0.51 (0.23-1.17)	0.11
Fever/Malaria				
No				
Yes	0.26 (0.08-0.89)	0.03*	0.26 (0.07-1.00)	0.05**
Livestock-herding				
Yes				
No	1.22 (0.73-2.02)	0.43	1.16 (0.72-1.88)	0.52
Child gender				
Male				
Female	0.69 (0.36-1.34)	0.27	0.68 (0.33-1.99)	0.28
Child age (months)				
6-11				
12-17	1.73 (0.71-4.19)	0.22	1.62 (0.65-4.02)	0.15
18-23	2.8 (1.16-6.77)	0.02*	2.51 (1.00-6.35)	

Table 2 Chi-squared test of livestock by stunting and wasting (n=277), p-value 0.03

	No livestock	Own livestock	Total
	n (%)	n (%)	n (%)
Not stunted + wasted	40 (93)	180 (98)	220 (97)
Stunted + wasted	3 (7)	4 (2)	7 (3)
Total	43 (100)	184 (100)	227 (100)

was 28%, with severe stunting of 5%. In the univariate logistic regression analysis, (lack of) caretaker hand-washing at four critical moments, having had fever or malaria in the past two weeks, and child age were associated with stunting. After adjusting for all the variables and a priori variables in multivariable logistic regression, none of the variables turned out to be associated with stunting. However, there was a borderline association between having experienced fever or malaria in the past two weeks and stunting (adjusted odds ratio=0.26, 95% confidence interval=0.07-1.00, p=0.05).

Wasting

Wasting prevalence was 8.8% based on WLZ, with only two severe wasting cases; MUAC produced a smaller prevalence of wasting (1.32%). Among those variables tested, lack of access to toilet facilities was significantly associated with wasting (p=0.09). Although not statistically significant, wasting was found to increase with age, with the 18-23 month age group having the highest wasting prevalence. No other risk factors were statistically significantly associated with wasting, and multivariate logistic regression was not conducted with wasting due to the low sample size for this indicator.

Combined stunting and wasting

While only a small sub-sample of the population was found to be both wasted and stunted, these children were significantly more likely to come from a household without any livestock ownership (p=0.03). The correlation between stunting and wasting was low at 5%.

Conclusions and recommendations

The prevalence of stunting in this pastoralist population in Samburu was 28.19%, which falls under the medium severity range according to the WHO classification of severity of malnutrition (WHO Global Database). Older children were more stunted than the younger ones. Median LAZ in all the age groups was below that of the reference population. In the univariate logistic

regression analysis, three explanatory variables – hand-washing at four critical moments, having had fever or malaria in the past two weeks and child age – were associated with stunting. In the multivariate logistic regression analysis, none of these variables and a priori variables was significantly associated with stunting. However, there was a marginal association between fever or malaria and stunting.

The prevalence of wasting based on WLZ was 8.8%, which may also be considered in the range of medium severity according to the WHO classification (WHO Global Database). However, the body shape of pastoralist populations has been shown to be taller and thinner than sedentary populations, indicating that MUAC may be a better measure of wasting in such populations (Iannotti & Lesorogol, 2014). The prevalence of wasting based on MUAC was much lower.

Having access to toilet facilities and wasting were weakly associated. There was no evidence that the rest of the variables tested were associated with wasting. However, those children who were both stunted and wasted were more likely to be in households that did not own livestock.

There are several limitations to this secondary data analysis. Because the dataset is cross-sectional in nature, it only shows the nutritional status of children at one point in time and cannot account for seasonality and how this may affect prevalence of stunting and wasting. Additionally, because the SMART survey was not designed for the current analysis, the statistical power to detect an effect of the potential predictors on the outcomes of interest may be low. The lack of association, therefore, may be attributed to the study design and to errors in data entry, which resulted in a small sample size after data merging.

These results highlight the need for both programme-specific data and measurement-related improvements to be made at the field level and beyond. The following recommendations may be considered:

Programme-specific recommendations:

1. Address poor WASH practices among the Samburu;
2. Address access to healthcare for pastoralist communities;
3. Improve dietary diversity among children under two years old;
4. Increase integration across nutrition, WASH, reproductive health and health sectors to address multi-factor risk factors in settings of stunting and wasting.

Data and measurement-related recommendations:

5. Consider powering SMART surveys to look at stunting as well as acute malnutrition in settings where both are known to be prevalent;
6. Adjust reporting functions in Emergency Nutrition Assessment (ENA) to have the option to include stunting where relevant;
7. Ensure data quality (unique IDs to ensure datasets can be linked between sector-specific surveys on the same population, or linked over time);
8. Improve monitoring and evaluation integration between nutrition, WASH, reproductive health and health sectors;
9. Rigorous research trials are needed to determine best measurement of wasting (MUAC vs. WLZ) in pastoralist contexts before meaningful work on stunting and wasting among these communities is possible;
10. A rigorous impact evaluation of HiNi interventions on stunting and wasting among the Samburu is needed to determine pathways and explain lack of significant improvement in nutritional status despite ongoing, evidence-based interventions.

For more information, contact: Amelia Reese-Masterson or Mark Murage Gathii, email: areese@internationalmedicalcorps.org or mgathii@internationalmedicalcorps.org

References

- Black RE, Victora CG, Walker SP, et al. *Maternal and child undernutrition and overweight in low-income and middle-income countries*. *Lancet*. 2013;382(9890):427-451. doi:10.1016/S0140-6736(13)60937-X.
- Iannotti L, & Lesorogol C. *Animal milk sustains micronutrient nutrition and child anthropometry among pastoralists in Samburu, Kenya*. *Am J Phys Anthropol*. 2014;155(1):66-76. doi:10.1002/ajpa.22547.
- KNBS, 2009. *Kenya National Bureau of Statistics and Ministry of Planning National Development and Vision 2030. Kenya – 2009 Kenya Population and Housing Census (10 Per Cent Sample, Every 10th Household), Population and Housing Census*; 2009.
- Khara T, & Dolan C. *Technical Briefing Paper: The Relationship between Wasting and Stunting, Policy, Programming and Research Implications*; 2014. doi:10.1016/S0306-3747(96)90467-4.
- KDHS, 2010. *Kenya Demographic and Health Survey 2008-09*; 2010.
- KDHS, 2010. *Macro KNB of S (Knbs) and I. Kenya Demographic and Health Survey 2008-09*; 2010.
- MPHS, 2011. *Kenya Comprehensive Multi-Year Plan for Immunization 2011-2015*; 2011.
- MPHS, 2012. *National Nutrition Action Plan 2012-2017*; 2012.
- WHO Global Database. *World Health Organization Global Database on Child Growth and Malnutrition*. www.who.int/nutgrowthdb/about/en/
- UNICEF, WHO, World Bank, 2016. *Update of UNICEF/WHO/World Bank database on child malnutrition | Field Exchange* www.enonline.net/fex/47/malnutrition#. Accessed March 2, 2016.



The 2001-03 famine and the dynamics of HIV in Malawi

A natural experiment

Summary of research¹

An abandoned rural house in central Malawi during the 2002 famine



Location: *Malawi*

What we know: Poverty and inequality are well recognised structural determinants of HIV epidemics that are typically considered slow to change. Studies examining HIV prevalence decline typically investigate sexual behaviour change.

What this article adds: A recent study examined the effect of hunger on the dynamics of HIV in urban and rural sites in conditions created by the Malawi famine of 2001-03. The relationship between HIV prevalence (antenatal surveillance data) and rural hunger (households needing food aid); rural hunger and antenatal population changes and migration patterns were investigated. At rural sites an increase in 20.2% HIV prevalence was positively and non-linearly related to the extent of rural hunger ($P = 0.016$). In urban and semi-urban settings, prevalence declined as rural hunger increased ($P = 0.006$), reflecting rural (low risk) to urban (higher risk) migration. The Malawi famine appears to have had a rapid and substantial effect on HIV dynamics and demography. Rural-to-urban migration of women quickly impacted on prevalence. Actions that undermine food security can change prevalence and distribution of HIV infections. Epidemic patterns risk being misread if these kinds of social and economic change are ignored.

A recent study makes use of the near-experimental conditions, created by the Malawi famine of 2001-03, as a country-scale natural experiment on the effect of hunger on the dynamics of HIV. The author hypothesises that the famine will have increased three of the fundamental determinants of HIV prevalence: incidence (from transactional sex and more early marriage); emigration and immigration in rural villages; and immigration and possibly subsequent incidence in towns and cities, for those in search of food or work. Hunger can also lead to depressed immune function, increasing the risk of infection once exposed.

Method

Multilevel, random intercept models were used to relate the change in HIV prevalence at antenatal surveillance sites (8 rural, 11 non-rural) over the course of the famine to the proportion of rural households requiring food aid in the surrounding district at the famine's peak. Similar models were used to relate this indicator of rural hunger to changes in the composition of the antenatal population. The extent and direction

of migration were estimated from a household survey conducted one to two years after the famine.

Findings

At rural sites, the change in HIV prevalence (increase of 20.2% over the course of the famine) was positively and non-linearly related to the extent of rural hunger ($P = 0.016$), consistent with contemporary accounts of increased transactional sex and with hunger compromising immune function.

At non-rural sites (urban and semi-urban), prevalence declined as rural hunger increased ($P = 0.006$), concentrated in women who self-identified as farmers ($P = 0.010$). This finding is consistent with contemporary accounts of migration in search of food and work from villages, where HIV risk was lower, to towns and cities, where it was higher.

Corroborating this interpretation, the proportion of farmers in the antenatal population was found to rise at non-rural sites as rural hunger increased in the surrounding district ($P = 0.015$), whereas the proportion fell with

increasing rural hunger at rural sites ($P < 0.001$). The author interprets this as hunger pushing farmers into the towns and cities (and to other less-affected rural sites) as it removed farmers from the villages. The evidence presented in the paper suggest migrants were predominantly farming women under 25 years of age ($P = 0.010$). The 2004-05 integrated household survey confirmed that there was a surge in rural-to-urban migration during the famine, particularly by women under 25 years.

Conclusion

The Malawi famine appears to have had a rapid and substantial effect on HIV dynamics and demography. This study has relevance to situations beyond Malawi, as poverty and inequality, commonly considered structural determinants of HIV epidemics, can change rapidly, apparently transmitting their effects on the dynamics of HIV with little lag. This is important information for public health professionals, who generally consider such structural determinants of HIV to be slow to change. Epidemic patterns risk being misread if these kinds of social and economic change are ignored, with critical implications for policy. The author questions whether rural out-migration (which may be accelerated by hunger) has contributed materially to HIV declines elsewhere, as plausible conditions are frequently met in sub-Saharan Africa; HIV prevalence is generally lower in rural areas and the population is generally greater in rural than urban populations. Many studies examining HIV prevalence declines have implicated sexual behaviour change, but do not appear to have adequately considered the contribution of rural-urban migration. The evidence from Malawi, which links actions that undermined people's food security to changes in the prevalence and distribution of HIV infections, suggests new opportunities for prevention.

See letters for a comment by the author regarding further lessons from this experience.

¹ Loevinsohn, M. (2015) *The 2001-03 famine and the dynamics of HIV in Malawi: A natural experiment*. PLOS one. DOI:10.1371/journal.pone.0135108. September 2015

Routine amoxicillin use in treatment of uncomplicated SAM in children

Summary of research¹

Location: *Niger*

What we know: Routine use of broad-spectrum antibiotics is recommended in uncomplicated SAM case management; there is a lack of evidence on whether this is indicated in different population groups.

What this article adds: A recent randomised, double-blind, placebo-controlled trial was conducted by Médecins Sans Frontières (MSF) in Niger to assess the effect of routine amoxicillin use, as compared with placebo, on nutritional recovery in children with uncomplicated SAM. A total of 1,199 in the amoxicillin group and 1,200 in the placebo group were studied. Baseline characteristics were similar; one confirmed case of HIV was included. The SAM recovery rate was 64%. The prevalence of infection among uncomplicated cases in this study (n=1,000 sub-group) was low. No significant benefit of routine amoxicillin use was found with respect to nutritional recovery. In terms of secondary outcomes, amoxicillin use was associated with significantly shorter time to recovery (28 v 30 days); reduced risk of death among children 24 months of age; decreased risk of inpatient transfer for complications and acute gastroenteritis; and accelerated gains in weight and MUAC. These findings inform the evidence for context-specific recommendations regarding routine antibiotic use in uncomplicated SAM.

Earlier detection of severe acute malnutrition (SAM) cases through community-based management of acute malnutrition (CMAM) has affected the caseload and clinical profile of SAM children. Routine use of broad-spectrum antibiotics is conditionally recommended in uncomplicated SAM case management, based on low-quality evidence. A recent study presents the results of a randomised, double-blind, placebo-controlled trial in Niger that assessed the effect of routine amoxicillin use, as compared with placebo, on nutritional recovery in children with uncomplicated SAM.

Methods and outcomes

The study was conducted at four health centres in the rural health district of Madarounfa, Niger. All children meeting criteria for outpatient treatment were eligible if they lived within 15 km of the centre, were available for the 12-week study period, had not been admitted to a nutritional programme within the previous three months or received any antibiotic within the previous seven days, had no clinical complications requiring antibiotic treatment, and had no congenital abnormalities. Amoxicillin was chosen in accordance with current national guidelines in Niger.

Children were randomly assigned to receive amoxicillin (80 mg per kg of body weight per day, divided into two daily doses) or placebo for seven days. Adherence was evaluated at the first weekly visit through direct questioning of the caregiver and review of a pictorial calendar recording home administration of the study medication.

The primary outcome was nutritional recovery by eight weeks. Nutritional recovery was documented at or after three weeks if a child had a weight-for-height Z score (WHZ) of -2 or higher

on two consecutive visits and a mid-upper arm circumference (MUAC) of 115 mm or greater; if there was no acute complication or oedema for at least seven days; and if the child had completed all antibiotic and antimalarial treatments at the time of discharge from the nutritional programme. Secondary outcomes included non-response at eight weeks, death from any cause, default (defined as three or more consecutive missed weekly visits), and transfer to inpatient care. Non-response was documented if a child did not meet the criteria for nutritional recovery at eight weeks.

Study procedures

All children received standard SAM treatment care with transfer to inpatient care (and subsequent follow-up at weeks two and four) if indicated. Children were seen at the study health centres at four, eight and 12 weeks after study enrolment, regardless of their status in the nutritional programme; physical examination, history-taking and anthropometric assessment were repeated at these follow-up visits.

Stool, urine and blood samples were collected on admission to the nutritional programme from a subset of 1,000 children over a period of 12 months. Bacterial gastroenteritis was defined as a stool culture that was positive for a known pathogen and diarrhoea. Confirmed cases of bacteraemia or bacteriuria were followed up and clinically managed.

Statistical analysis

A sample of 1,005 children in each group was calculated to provide the study with 80% power at a two-sided alpha level of 0.05 to detect a between-group difference in nutritional recovery of at least 5%, assuming an 80% likelihood of nutritional recovery in the amoxicillin group.

Allowing for a 20% rate of loss to follow-up, 1,206 children were required for each group. With an observed likelihood of recovery of 63%, the study had 73% power to detect a 5% difference between groups. All analyses were based on the intention-to-treat principle. Risk ratios and 95% confidence intervals for each secondary outcome were calculated by means of unadjusted log-binomial regression. Between-group comparisons of time to recovery, transfer to inpatient care and death among children without a response were performed with the use of t-tests.

Results

Between October 2012 and November 2013, a total of 16,421 children presented at the four health centres. A total of 2,412 children were randomly assigned to a study group; 13 were subsequently excluded for protocol violations and 2,399 children (1,199 in the amoxicillin group and 1,200 in the placebo group) were included in the final analysis. Baseline characteristics were similar in the two groups, with no clinically relevant differences. One child was confirmed to be HIV-positive and was included in the study. Programme outcome was attributed to all children at eight weeks after admission to the nutritional programme. The rate of reported adherence, defined as completion of all seven days of the study regimen, was 99% and did not differ significantly between the two groups ($P>0.05$).

Overall, 64% of the children enrolled in the study (1,542 of 2,399) recovered from SAM. There was no significant between-group difference in the likelihood of nutritional recovery (risk ratio with amoxicillin vs. placebo, 1.05; 95% confidence interval [CI], 0.99 to 1.12).

Among children who recovered, the time to recovery was significantly shorter with amoxicillin than with placebo; 28 days versus 30 days ($P<0.001$). Amoxi+llin had no significant effect among children with a confirmed bacterial infection at admission to the nutritional programme and the effect did not vary significantly according to age or sex ($P>0.05$ for interaction).

The risks of non-response at eight weeks, default and death were similar in both groups. There was a significant interaction of age in the risk of death ($P=0.04$ for interaction); amoxicillin tended to reduce the risk of death among children aged 24 months or older (risk ratio, 0.24; 95% CI, 0.03 to 2.12) but not among children younger than 24 months (risk ratio, 3.04; 95% CI, 0.61 to 15.01). A total of 13 children died during treatment (seven in the amoxicillin group and six in the placebo group); the time to death did not differ significantly between the groups.

Amoxicillin significantly decreased the overall risk of a transfer to inpatient care and the risk of a transfer within the first two weeks. Amoxicillin significantly reduced the risk of a transfer for clinical complications in general (by 31%) and for acute gastroenteritis in particular (by 33%). The study intervention had no effect on the risk of a transfer to inpatient care among children with any bacterial infection.

Amoxicillin significantly accelerated early gains in weight and MUAC that appeared to contribute to a slightly faster time to recovery (mean, two days). There was no significant effect on height gain.

The frequency of diarrhoea was lower in the amoxicillin group than in the placebo group at week one, with no significant effect of amoxicillin on the incidence of other clinical symptoms. The overall prevalence of bacterial infection in blood, urine and stool from children with diarrhoea was low. The likelihood of resistance to amoxicillin was 35% for enterobacteria isolated from stool in children with diarrhoea and 66% for enterobacteria isolated from blood.

Discussion

Routine provision of amoxicillin was not superior to placebo for nutritional recovery in children with uncomplicated SAM. Amoxicillin reduced

the risk of a transfer to inpatient care by 14%, as compared with placebo. Of note:

- Half (53%) of children transferred to inpatient care according to the study protocol (49% in the amoxicillin group and 56% in the placebo group) were admitted to a hospital. For a multitude of reasons, only 50% of children who were eligible for inpatient care because of weight loss or lack of weight gain were actually admitted. Amoxicillin reduced the risk of hospitalisation, potentially a more specific and generalisable secondary end-point than transfer to inpatient care, by 24%, as compared with placebo (risk ratio, 0.76; 95% CI, 0.62 to 0.92).
- Among hospitalised children, there were no significant between-group differences in the mean length of stay (4.9 days in the amoxicillin group and 4.4 days in the placebo group, $P=0.32$) or the rate of recovery (94% and 96%, respectively). All children recovered quickly, suggesting that adequate inpatient care may mitigate any risk of absent routine antibiotics.
- The reduced risk of transfers for gastroenteritis was an unexpected finding, since the responsible viruses and parasites are not sensitive to amoxicillin. Reasons may include translocation of bacteria across compromised intestinal surfaces resulting in

bacteremia or modification of the composition and function of the gut microbiome by oral antibiotics.

There are a number of considerations when interpreting the findings. The prevalence of infection among uncomplicated cases in this study was low. Assumed nutritional recovery (80%) was not achieved; amoxicillin may have had a protective or harmful effect on nutritional recovery. Mortality was lower than expected and previously reported. Alternative antibiotic regimens could have maximised recovery. Finally, the study interventions were performed by well-trained and supervised medical personnel; not typical field conditions.

Conclusions

In conclusion, no significant benefit of routine amoxicillin use was found with respect to nutritional recovery among children with uncomplicated SAM in Niger. These findings provide useful information for public health authorities and their implementing partners regarding the routine use of antibiotics in the treatment of uncomplicated SAM.

¹ Isanaka S, Langendorf C, Berthé F, Gnegne S, Li N, Ousmane N, Harouna S, Hassane H, Schaefer M, Adehossi E & Grais R. Routine Amoxicillin for Uncomplicated Severe Acute Malnutrition in Children. *N Engl J Med* 2016; 374:444-453 February 4, 2016 DOI: 10.1056/NEJMoa1507024.

Short children with a low MUAC respond to food supplementation

An observational study from Burkina Faso

Summary of research¹

Location: *Burkina Faso*

What we know: Where MUAC is used as an admission criterion for SAM treatment, it is common practice to exclude children with lengths <67cm.

What this article adds: An observational study, nested in a randomised trial, compared the growth rate between 468 moderately malnourished children <67 cm and ≥67 cm in length, admitted to a supplementary feeding programme (SFP) solely under MUAC criterion (115-124 mm). Weight gain was 12% during 12 weeks of supplementation and MUAC increased 6% (10-12 weeks) and did not differ between short and long children. Weight-gain velocity was similar between both groups from baseline; MUAC-gain velocity was comparable from week four. Short children took longer to recover; 71% short v 90% long had recovered by week 12. The authors suggest to admit children <67cm who fulfil MUAC criteria for admission to SFPs.

Moderate wasting alone affects 5% of children under five years old worldwide and is associated with a three-fold increased risk of death. Moderate wasting is usually defined as a weight-for-height Z score (WHZ) between -3 and -2, and/or a measure of mid-upper arm circumference (MUAC) between 115 and 124 mm. MUAC is a simpler assessment tool and may be better than WHZ in identifying children at risk of death. The management of children with moderate acute malnutrition (MAM) relies primarily on food supplementation in outpatient programmes. In such programmes, MUAC is often used as the sole admission criterion where it is common practice to exclude from treatment children with lengths <67cm.

These short children with a low MUAC are believed to be either young (<6 months)

or stunted, rather than acutely malnourished, and therefore would not have the rapid “catch-up” growth typical of more wasted children. A secondary concern is that they may be harmed by prolonged exposure to supplementary foods, for example through excessive gain of fat mass. The World Health Organisation (WHO) has called for research to identify the appropriate MUAC admission and discharge criteria for children <67cm and aged ≥ 6 months. This study aims to contribute to this evidence base by testing the hypothesis that, among children given supplementary feeding based on an MUAC of 115-124 mm as the sole criterion, there would be no difference in growth rate between children <67 cm and those ≥67 cm in length at programme admission.

Study overview

This was an observational study nested in a randomised trial (Treatfood²) that investigated the effectiveness of new, improved formulations of corn-soy blend (iCSB) supplement and lipid-based nutrient supplements (LNS). Six iCSBs and six LNS combine different soy qualities (dehulled soy, soy iso-

¹ Fabiansen, C., Phelan, Kevin, P.Q., Cichon, B., Ritz, C., Briend, A., Michaelsen, K.F., Friis, H. and Shepherd, S. (2016) Short children with a low midupper arm circumference respond to food supplementation: an observational study from Burkina Faso. *American Journal of Clinical Nutrition*, February 2016, vol. 103, no. 2, pp.415-421.

² For trial information, see: <http://www.treatfood.org/>

late) and different amounts of dried skimmed milk. The study on the different product formulations found that all were well accepted. (Iuel-Brockdorf, Draebel, Ritz et al, 2016). The study was conducted in the Province du Passoré in the northern region of Burkina Faso in an area qualifying for supplementary feeding programmes (SFPs) based on the prevalence of acute malnutrition. Children were randomly assigned to 12 different groups (six based on iCSB and six based on LNS) and given supplements with an energy amount of 500 kcal per daily serving (130g iCSB or 92g LNS) for a three-month period. Children aged six to 23 months with a MUAC of between 115 and 124mm but with WHZ ≥ -2 were included. This cohort was divided into two groups by length at admission: 67 cm (“short”) and ≥ 67 cm (“long”).

Children were scheduled for a clinic visit every two weeks during the 12-week supplementation period, during which anthropometric and clinical status were assessed, including MUAC, weight and height/length. Anthropometric measurements were performed by trained staff, after standardisation sessions. Increases in weight and MUAC were calculated as percentages from baseline. Weight-gain velocity was defined as a change in weight (in g/kg/d; per milled (%) change/d) from baseline. MUAC-gain velocities were calculated similarly as change/d (i.e., 0.01 mm/cm/d).

Recovery was defined as a MUAC measurement >125 mm on two consecutive visits (two weeks apart) as applied in programmes. Children who missed scheduled visits were visited by community health workers at their homes and encouraged to return for follow-up. Children who missed two consecutive visits were regarded as defaulters. Children received vitamin A supplementation, deworming and medical treatment or referrals based on the integrated management of childhood

illness (IMCI) guidelines. Linear, mixed-effects models and regression models were used to compare gains in weight and MUAC, adjusted for intervention, season, sex, age and site.

From 9 September 2013 to 29 August 2014, a total of 1,609 children were included in the Treatfood trial. Fifty per cent of children (804) were included by both WHZ and MUAC criteria (this high degree of overlap is expected in younger/shorter children), 21% (337) by WHZ alone and 29% (468) by MUAC alone. Among the 468 children recruited by MUAC-only, 230 (49%) were <67 cm (short) and 238 (51%) were ≥ 67 cm (long). Baseline characteristics of MUAC-only admissions by length category are included in Table 1. The average age of MUAC-only short children was 7.7 ± 1.6 months; average length was 63.9 ± 2.1 cms; average weight was 6 kg ± 1.4 ; and most (83%) were girls.

Results

After 12 weeks of supplementation, weight gain was 12% from baseline and did not differ between short and long children. The increase in MUAC was 6% after ten to 12 weeks of supplementation and did not differ between groups. Weight-gain velocity from baseline showed a similar development between groups throughout supplementation. MUAC-gain velocity from baseline was also similar between groups from week four. The longer children gained in MUAC more quickly than they did in weight over the first two weeks of the study, compared to the short children. But both groups were gaining weight and MUAC at a faster rate than is described by the WHO 2006 growth reference. Weight and MUAC gain velocities from the last visit remained similar between short and long children; initially high, they were approaching velocities for well-nourished reference children towards the end of supplementation. There was no effect modification by different product formulations (12



Amanda Maust, Malawi, 2013

in total) on weight-gain velocity ($P = 0.65$) or MUAC-gain velocity ($P = 0.45$).

There was a weak overall difference in weight-gain velocity from baseline to 12 weeks between quartiles of baseline length ($P = 0.03$), reflecting a slight downward trend from the lowest to the highest quartile. Weight-gain velocity across length quartiles was not modified by stunting ($P = 0.32$). For MUAC-gain velocity, there was no overall difference between length quartiles ($P = 0.12$) and no effect modification by stunting ($P = 0.75$). The short group took more time to reach the MUAC recovery criterion than did the long group: at week four, 39% of short compared with 57% of long children had recovered ($P = 0.01$). This difference of around 20% points was maintained throughout supplementation, such that at week 12, 71% of children in the short group had reached recovery, compared with 90% of children in the long group. At the last visit, week 12, an additional 10% of short children and 3% of long children reached a single MUAC measurement of ≥ 125 mm. More than half of the children in the long group had recovered according to MUAC at week two in the study, whereas for the short group this occurred at week six in the study.

The authors conclude that there was no evidence of a difference in percentage of weight gain or weight-gain velocity during supplementary feeding in short or long children aged six-23 months. On this basis, the authors suggest a policy change to include children <67 cm in SFPs if their MUAC is between 115 and 124 mm and their WHZ is ≥ -2 .

Table 1 Baseline characteristics of participants included by MUAC only ($n = 468$), by length category³

	Short ⁴ ($n = 230$)	Long ⁵ ($n = 238$)	P
Girls, % (n)	83 (191)	72 (171)	0.004
Age, mo	7.7 ± 1.6^6	14.2 ± 4.4	<0.001
Length, cm	63.9 ± 2.1	72.2 ± 4.1	<0.001
Weight, kg	6.0 ± 0.4	7.5 ± 0.8	<0.001
MUAC, mm	121 ± 2.6	122.2 ± 1.9	<0.001
Weight-for-height z score	-1.5 ± 0.4	-1.7 ± 0.3	<0.001
Weight-for-age z score	-2.4 ± 0.6	-2.1 ± 0.6	<0.001
Length-for-age z score	-2.0 ± 1.0	-1.7 ± 1.1	<0.001
Length-for-age z score, -2, % (n)	49 (113)	36 (86)	0.004
Season at time of inclusion, % (n)			0.181
Dry season	63 (144)	68 (163)	
Rainy season	37 (86)	32 (75)	
Food supplement, % (n)			0.413
CSB	50 (115)	46 (110)	
LNS	50 (115)	54 (128)	
Site, % (n)			0.007
0	13 (29)	25 (60)	
1	17 (38)	11 (26)	
2	21 (48)	16 (39)	
3	29 (66)	28 (67)	
4	1 (49)	19 (46)	
Breastfeeding, % (n)	100 (229)	91 (216)	<0.001

³ CSB, corn-soy blend; LNS, lipid-based nutrient supplement; MUAC, midupper arm circumference.
⁴ Short = <67 cm in length.
⁵ Long = ≥ 67 cm in length.
⁶ Mean \pm 6 SD (all such values).

References

Iuel-Brockdorf A., Draebel T.A., Ritz C., Fabiansen C., Cichon B., Christensen B. V., Yameogo C., Oummani R., Briand A., Michaelsen K.F., Ashorn P., Filteau S., Friis H., 2016. Evaluation of the acceptability of improved supplemental foods for the treatment of moderate acute malnutrition in Burkina Faso using a mixed method approach. *Appetite* Vol. 99 April 2016 pp34-45.

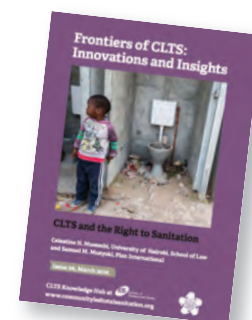
Effect of a community-led sanitation intervention on child diarrhoea and child growth in rural Mali

Summary of research¹

Location: *Mali*

What we know: Community-led total sanitation (CLTS) is being scaled up, but there is limited evidence on child health impacts.

What this article adds: A randomised trial of CLTS to assess its effect on child health was undertaken in a rural setting of Koulikoro, Mali. No differences were observed in diarrhoeal prevalence between CLTS and control villages. In CLTS villages, access to private latrines doubled and was twice as high as controls, reported open defaecation was reduced, children were more likely to use a potty for defaecation, latrines were observed to be in better condition, and households were more satisfied with their overall sanitation situation. Children in CLTS villages were taller and less likely to be stunted (especially children under two years old); there was minimal difference in underweight prevalence. CLTS households were less likely to report a child death by diarrhoea. No significant difference was found in faecal contamination of drinking water sources and household-stored water. The results suggest that a behavioural intervention can substantially increase access to sanitation facilities in a rural setting without financial subsidies. Future research is warranted to understand whether improved sanitation could improve child height through pathways other than diarrhoea reduction.



Background

Community-led total sanitation (CLTS) uses participatory approaches to mobilise communities to build their own toilets and stop open defecation. CLTS aims to change behaviour sustainably through the elicitation of strong emotional drivers such as shame, disgust, pride and dignity that trigger collective action in the community to stop open defecation. While CLTS has been scaled up in 50 countries to date, there is some concern regarding the few independent evaluations of the approach and no published randomised controlled trials of the programme. The aim of this study was to undertake the first randomised trial of CLTS to assess its effect on child health in a rural setting of Koulikoro, Mali.

Methods

A cluster-randomised trial was used to assess a CLTS programme implemented by the Government of Mali in collaboration with UNICEF. The study population included households in rural villages (clusters) from the Koulikoro district of Mali that met government eligibility criteria (not previously received CLTS programme, latrine coverage less than 60% and population 30-70 households). Every household had to have at least one child under ten years of age. Data collection was completed by an independent organisation. Villages were randomly assigned (1:1) with a computer-generated sequence by a study investigator to receive CLTS or no programme (with at least a 10 km buffer between all villages to prevent programme contamination from intervention to control populations). In intervention villages, a sanitation committee was formed and CLTS 'triggering

sessions' conducted involving orientation on practical actions and securing commitments to build latrines and on safe defecation practices. Villages were visited every two to four weeks to monitor progress.

A village census, gathering of household survey data and child anthropometric measurements were undertaken to provide baseline data. In-home interviews were conducted with the female primary carer of the youngest child in the household. Health outcomes included diarrhoea (three or more loose stools in the previous 24 hours as the primary outcome), with the secondary outcome of respiratory illness. Child growth (as a broad indicator of child enteric infections) was measured by height-for-age (HAZ) and weight-for-age (WAZ). Households were asked to report all cause and diarrhoea-related mortality. To better understand pathways of impact on child outcomes, direct observations of sanitation facilities and household interviews were undertaken and drinking water source and household-stored water were sampled. Outcomes were measured one and a half years after intervention delivery (two years after enrolment) among children under five years old. Participants were not masked to intervention assignment.

Findings

Participants were recruited between April 12 and June 23 2011. Sixty villages (2,365 households) were assigned to receive the CLTS intervention and 61 villages (2,167 households) were assigned to the control group. The study population included 6,862 children younger than five years old at baseline and 6,413 children who were younger than five years were included at fol-

low-up from baseline households. Baseline diarrhoeal and respiratory illness symptoms were at higher prevalence in villages assigned to the CLTS intervention. Anthropometric mean measurements and distributions of children younger than five years were similar.

No differences were observed in terms of diarrhoeal prevalence among children in CLTS and control villages (706 [22%] of 3,140 CLTS children vs 693 [24%] of 2,872 control children; prevalence ratio [PR] 0.93, 95% CI 0.76-1.14).

Access to private latrines doubled (from 33% and was almost twice as high in intervention villages where access did not change from baseline (1,373 [65%] of 2,120 vs 661 [35%] of 1,911 households). Reported open defecation was reduced in female (198 [9%] of 2,086 vs 608 [33%] of 1,869 households) and in male (195 [10%] of 2,004 vs 602 [33%] of 1,813 households) adults. Mothers reported that children younger than five years were significantly more likely to use a child potty (50.5%) as the main defecation location in CLTS villages than in control villages (15.4%).

Children in CLTS villages were taller (0.18 increase in HAZ, 95% CI 0.03-0.32; 2415 children) and less likely to be stunted (35% vs 41%, PR 0.86, 95% CI 0.74-1.0) than children in control villages. Twenty-two per cent of children were underweight in CLTS compared with 26% in

¹ Pickering, A. J., Djebbari, H., Lopez, C., Coulibaly, M., Alzua, M. L. (2015). Effect of a community-led sanitation intervention on child diarrhoea and child growth in rural Mali: a cluster-randomised controlled trial. *Lancet Global Health* 2015; 3: e701-11

control villages (PR 0.88, 95% CI 0.71-1.08), and there was minimal difference in mean WAZ at 0.09 (95% CI 0.04-0.22) between groups. Effects on child growth were more pronounced for younger children in CLTS villages (<2 years), who showed greater improvements in height and weight than older children, were less likely to be stunted and less likely to be severely underweight than children in control villages. Children younger than one year old at baseline showed the largest improvements in height and weight.

Regarding deaths during the study period, 48% (n=331) of all deaths were of children aged under five years. While households in CLTS and control groups were equally likely to report a death of a child younger than five years, CLTS households were less likely to report a child death by diarrhoea than control households (PR 0.47, 95% CI 0.23-0.98). Latrines at CLTS households were more than twice as likely to have a cover over the hole of the pit, appeared to be in regular use (according to reports from field staff), were more likely to be stocked with soap and water for hygiene purposes, and were less likely to have animal or human faeces in them or the surrounding area. Households in the CLTS programme were less likely to share latrines with other households than in the control group.

CLTS households were more likely to report being satisfied with their overall sanitation situation and women were more likely to feel they had privacy and safety while defecating at night.

CLTS households were more likely to report treating their stored drinking water, although no significant difference was found in faecal contamination of drinking water sources and household-stored water between control and intervention households. Female respondents in CLTS villages reported higher daily frequency of hand-washing than in control villages, although no difference was reported between those who had visible dirt on their palms between the two groups.

Discussion

For villages that received a behavioural sanitation intervention, diarrhoeal prevalence remained similar to control villages. The absence of an effect on diarrhoea is consistent with the study finding of similar drinking water quality across the two groups. However, access to toilets substantially increased, including the safe-management practices of child faeces.

Child growth substantially improved, with a reduction in stunting observed particularly in children under two years of age. These findings are consistent with the window of opportunity

to prevent long-term stunting in this age group and suggest that preventing early exposure to faecal contamination could be crucial to achieve improvements in child health. Future trials need to assess whether the association between reduced open defecation and child growth reported in this study can be replicated.

The authors suggest that CLTS might have prevented growth faltering through pathways other than reducing diarrhoea, such as reduction in the prevalence of intestinal worm infections, reduced child exposure to faecal contamination and improved hand-washing (and hence less exposure to environmental enteropathy). Future research is warranted to understand whether improved sanitation could improve child height through these pathways.

The results of this study suggest that a behavioural intervention can substantially increase access to sanitation facilities in a rural setting without financial subsidies. This is particularly relevant for poor households, who were three times more likely to have a private latrine in intervention villages than in control villages. The authors suggest that these findings justify scale-up of the CLTS programme in rural Mali and that the CLTS approach can be effective in improving access to sanitation.

Are studies underestimating the effects of sanitation on child nutrition?

Summary of published letter¹

A recently published letter in *The Lancet* comments on a study published in the same publication by Pickering et al (2015), who studied the effects of a community-led sanitation intervention in Mali. The authors used short-recall diarrhoea as the main outcome, but due to the well-known flaws with this indicator, they chose child anthropometric indicators, particularly growth outcomes, as secondary outcomes. As the exposure to improved sanitation was fairly short in this study (6-24 months) and the study focused on children aged 0-59 months, the relevant statistical tests mixed together younger children (for whom sanitation plausibly benefits linear growth) with older children (for whom sanitation plausibly offers little or no benefits). The findings from Pickering et al were consistent with this so-called 'exposure bias', showing effect of sanitation interventions on linear growth for younger children aged 0-24 months only (with the largest effect on children aged 0-12 months). Since the SHINE project findings (Prendergast et al, 2015) show that environmental enteropathy starts in utero through maternal infection, full exposure to improved

sanitation facilities ought, theoretically, to include children whose mothers had sanitation for the full duration of their pregnancy, if not before. The author suggests that these findings collectively indicate that future sanitation intervention trials should consider focusing on child growth as the primary indicator of interest; record when toilet facilities were first put into use (to measure duration of exposure); and focus on assessing the nutritional effects on younger children (aged 0-2 years), including exposure in utero.

¹ Derek Headey. (2016) *Are studies underestimating the effects of sanitation on child nutrition?* Lancet Global Health. Published Online February 1, 2016 dx.doi.org/10.1016/S2214-109X(15)00295-8

References

- Pickering AJ, Djebbari H, Lopez C, Coulibaly M, Alzua ML. *Effect of a community-led sanitation intervention on child diarrhoea and child growth in rural Mali: a cluster-randomised controlled trial.* Lancet Glob Health 2015;3: e701-11.
- Prendergast AJ, Rukobo S, Chasekwa B, et al. *Stunting is characterised by chronic inflammation in Zimbabwean infants.* PLoS One 2014; 9: e86928



Faecal sludge management in Malawi

Review of the role of food and the food system in the transmission and spread of ebola virus

Summary of research¹



Fruit bats of the Pteropodidae family are considered natural Ebola virus hosts

Location: *West Africa*

What we know: The current outbreak of ebola virus disease (EVD) centred in West Africa is the largest in history. The full role of food in EVD spread is not well studied.

What this article adds: TA recent literature review investigated how food may transmit ebola viruses and how the food system contributes to EVD outbreak and spread. Harvesting and consumption of ‘bushmeat’ is a high-risk activity; food insecurity may lead to more bush-meat harvesting and increase outbreak risk. There is evidence linking ebola to pigs; an outbreak amongst swine would have economic and potential outbreak implications. There is no published literature on the risk of plant food products transferring ebola virus; this would have implications for local and global food systems. Food and the food system may be more implicated in ebola virus transmission than expected; further research is urgently needed.

The current outbreak of ebola virus disease (EVD) centred in West Africa is the largest in history, with nearly ten times more individuals contracting the disease than all previous outbreaks combined. Active transmission was occurring in three countries (Guinea, Liberia and Sierra Leone), and seven additional countries experienced isolated cases. With food systems an integral part of a globalised world, this article investigates the connections that exist between EVD outbreaks and food, describes what is currently known about how food can transmit ebola viruses, and how the food system contributes to EVD outbreak and spread.

The details of human-to-human and zoonotic ebola virus transmission have justifiably received the largest share of research attention and much information exists on these topics. However, although food processing – in the form of slaughtering and preparing wildlife for consumption (referred to as bushmeat) – has been implicated in EVD outbreaks, the full role of food in EVD spread is poorly understood and has been little studied.

The authors conducted a literature review using keyword searches in online databases to assess the current state of knowledge regarding how food can or may transmit ebola viruses and how the food system contributes to EVD outbreak and spread. The authors categorised results of the search into various topics, outlined

below. Figure 1 outlines the ways in which food is connected to EVD outbreaks.

Animal food products and ebola virus transmission

Bushmeat

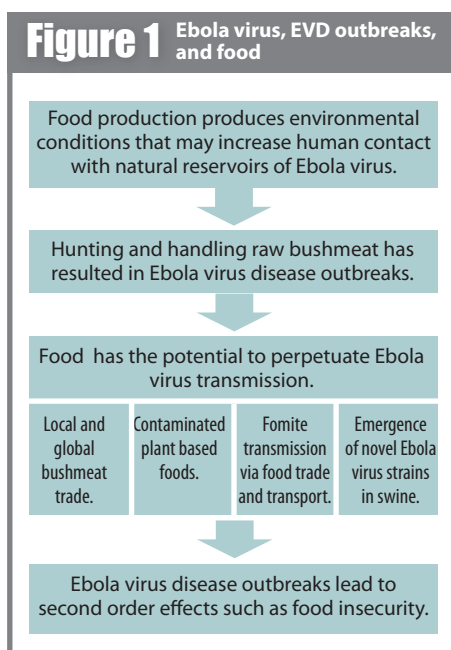
Although the exact nature of animal-to-human transmission of ebola viruses is not often known, the harvesting of bushmeat (including rodents, bats, shrews, duikers and non-human primates)

is directly related to ebola virus transmission. The hunting and butchering of bushmeat exposes humans to blood and other fluids of potentially infected animals. In 2014, the Centers for Disease Control and Prevention (CDC) noted that human ebola virus infections have been associated with handling and eating infected animals, with evidence of previous outbreaks of EVD beginning after humans handled infected carcasses of primates and duikers (Rouquet et al, 2005).

While bushmeat harvesting and consumption is a proven high-risk activity, it is an important source of cash income and a food source in West Africa, particularly during times of economic hardship (Leroy et al, 2009). The public health risk from zoonotic pathogens entering countries via infected bushmeat is estimated to be substantial due to widespread smuggling, including into the US and Europe, where demand is high, although exact figures and associated risk are very difficult to establish (European Food Safety Authority, 2014).

Livestock

It has been hypothesized that livestock could be a possible ebola virus reservoir, but studies to date on horses, sheep, goats, cattle and chickens have been inconclusive. There is, however, evi-



¹ Mann E, Streng S, Bergeron J, Kircher A, 2015. A Review of the Role of Food and the Food System in the Transmission and Spread of Ebolavirus. PLoS Neg Trop Dis 9(12):e0004160. doi:10.1371/journal.pntd.0004160

dence linking ebola viruses and pigs, specifically the 'Reston virus' (an ebola virus not pathogenic to humans) (e.g. Pan et al, 2014). Recent studies have shown that swine can become infected with ebola virus, develop clinical symptoms and transmit the virus to healthy pigs (Kobinger et al, 2011). In 2012, Weingartl et al determined that infected pigs could transmit the virus to non-human primates. Additional studies in Uganda and the Democratic Republic of the Congo (DRC) have suggested that EVD outbreaks have occurred in areas with high densities of swine (Weingartl et al, 2013) or following large mortality events of swine (Katayi, 2014). If swine are contributing to EVD aetiology, it is a cause for concern in sub-Saharan Africa where swine production is growing, often in areas near to the habitat of bats, who are increasingly being identified as the key ebola virus reservoir (Olival & Hayman, 2014).

Plant food products and ebola virus transmission

Consumption of contaminated plant food products

There is concern that ebola virus may be transmitted to humans via bat saliva or faeces on fruit such as mangoes or guava. This mechanism has been experimentally verified for the Marburg virus (a member of the Filoviridae family with ebola viruses) (Amman et al, 2015) and the Nipah virus, whose reservoir is also in fruit bats (Luby et al, 2009). It is plausible, therefore, that this mode of transmission may either start or aid the spread of EVD during outbreaks, although the current lack of knowledge and data make it impossible to quantify the risk (European Food Safety Authority, 2014).

Fomite transmission involving plant food products

Fomite transmission (transmission of infectious

disease by objects) of EVD is possible, although the risks during food harvesting and production are not well understood. There is no published literature on the risk of plant food products serving as fomites in ebola virus transmission, although other viruses are known to be transmitted via food contaminated by food preparers that can subsequently infect individuals after they consume or handle the food, such as hepatitis A (Boone & Gerba, 2007) and Lassa fever, which is closely related to EVD (WHO, 2015).

Fomite transmission depends on virus survival in the environment and studies have shown that the ebola virus is able to survive outside the host (especially at lower temperatures) between several days and over three weeks (Sagripanti et al, 2010). It should be noted that fomite transmission involving raw food products has not been documented and warrants further research.

Other ebola virus and food considerations

Public health consequences of landscape changes caused by food production

Food systems may indirectly contribute to EVD transmission, particularly the consequences of environmental conditions such as deforestation that lead to increased human interaction with wildlife species that carry ebola viruses (Muyembe-Tamfum et al, 2012). Experts have begun exploring the connections between the latest EVD outbreak and ecological disruptions, including those related to agriculture (Bausch & Schwarz, 2014).

Additional swine concerns

This article suggests that an EVD outbreak among farmed swine would pose a number of concerns, including: significant animal loss with severe economic consequences; fear and panic among consumers regarding EVD as a food-borne illness leading to severe market disruption;

and the considerable risk of ebola virus becoming endemic in wild pigs, which are known to carry numerous human disease-causing pathogens already (Bevins et al, 2014). There is an additional concern that swine could potentially serve as sites for new, more harmful strains of the virus to arise (MacNeil & Rollin, 2012).

Harvest, transport and trade

If ebola viruses do remain infectious on fomites for several weeks in a real-world environment, there are implications for the global food system from harvest to the end-consumer which could have major implications for the economies and labour forces of affected nations. A scenario is described in the paper where potential transmission involves an enclosed, refrigerated shipping container on a cargo ship transporting food products and the possible routes of contamination.

Food insecurity in West Africa

The EVD outbreak in West Africa has led to increases in food insecurity in the three affected countries. The authors summarise a UN Food and Agriculture Organization report from September 2014 of severe disruptions in food availability due to: quarantine-imposed travel restrictions on sellers and consumers; panic buying; dramatic price increases; and reduced food production and harvests (including income from cash-cropping) caused by farm labour shortages and restrictions on movement. Increasing food insecurity could potentially lead to more bushmeat harvesting and associated risks of further outbreaks.

Conclusions and research needs

While much remains unknown about ebola virus transmission (Osterholm et al, 2015), this literature reveals surprising preliminary evidence that food and the food system may be more implicated in ebola virus transmission than expected. Further research is urgently needed.

References

- Amman BR, Jones ME, Sealy TK, Uebelhoer LS, Schuh AJ, Bird BH, et al. *Oral shedding of Marburg virus in experimentally infected Egyptian fruit bats (Rousettus Aegyptiacus)*. *J Wildl Dis*. 2015; 51 (1):113–24. www.jwildlifedis.org/doi/abs/10.7589/2014-08-198 doi: 10.7589/2014-08-198 PMID: 25375951 PLOS Neglected Tropical Diseases | DOI:10.1371/journal.pntd.0004160 December 3, 2015 9 / 11
- Bausch DG, Schwarz L. *Outbreak of Ebola Virus Disease in Guinea: Where Ecology Meets Economy*. *PLoS Negl Trop Dis*. 2014; 8: e3056. doi: 10.1371/journal.pntd.0003056 PMID: 25079231 PLOS Neglected Tropical Diseases | DOI:10.1371/journal.pntd.0004160 December 3, 2015 10 / 11
- Bevins SN, Pedersen K, Lutman MW, Gidlewski T, Deliberto TJ. *Consequences Associated with the Recent Range Expansion of Nonnative Feral Swine*. *BioScience*. 2014; 64: 291–299. doi: 10.1093/biosci/biu015
- Boone SA & Gerba CP. *Significance of Fomites in the Spread of Respiratory and Enteric Viral Disease*. *Appl Environ Microbiol*. 2007; 73: 1687–1696. doi: 10.1128/AEM.02051-06 PMID: 17220247
- Chaber A-L, Allebone-Webb S, Lignereux Y, Cunningham AA, Marcus Rowcliffe J. *The scale of illegal meat importation from Africa to Europe via Paris*. *Conserv Lett*. 2010; 3: 317–321. doi: 10.1111/j.1755-263X.2010.00121.x
- European Food Safety Authority. *An update on the risk of transmission of Ebola virus (EBOV) via the food chain Part 2*. *EFSA J*. 2015; 13: 4042–4058. doi: 10.2903/j.efsa.2015.4042
- Katayi, K. *Ebola sleuths scour DR Congo jungle for source of outbreak (L'Agence France-Presse)*. Yahoo News. 23 Oct 2014. www.news.yahoo.com/ebola-sleuths-scour-dr-congo-jungle-sourceoutbreak-060715032.html. Accessed 3 Aug 2015.
- Kobinger GP, Leung A, Neufeld J, Richardson JS, Falzarano D, Smith G, et al. *Replication, Pathogenicity, Shedding, and Transmission of Zaire ebolavirus in Pigs*. *J Infect Dis*. 2011; 204(2):200–8. doi: 10.1093/infdis/jir077 PMID: 21571728
- Leroy EM, Epelboin A, Mondonge V, Pourrut X, Gonzalez J-P, Muyembe-Tamfum J-J, et al. *Human Ebola Outbreak Resulting from Direct Exposure to Fruit Bats in Luebo, Democratic Republic of Congo, 2007*. *Vector-Borne Zoonotic Dis*. 2009; 9: 723–728. doi: 10.1089/vbz.2008.0167 PMID: 19323614
- Luby SP, Gurley ES, Hossain MJ. *Transmission of human infection with Nipah virus*. *Clin Infect Dis Off Publ Infect Dis Soc Am*. 2009; 49: 1743–1748. doi: 10.1086/647951
- MacNeil A & Rollin PE. *Ebola and Marburg Hemorrhagic Fevers: Neglected Tropical Diseases?* *PLoS Negl Trop Dis*. 2012; 6: e1546. doi: 10.1371/journal.pntd.0001546 PMID: 22761967
- Muyembe-Tamfum JJ, Mulangu S, Masumu J, Kayembe JM, Kemp A, Paweska JT. *Ebola virus outbreaks in Africa: past and present*. *Onderstepoort J Vet Res*. 2012; 79: 451. doi: 10.4102/ojvr.v79i2.451 PMID: 23327370
- Olival KJ, Hayman DTS. *Filoviruses in Bats: Current Knowledge and Future Directions*. *Viruses*. 2014; 6: 1759–1788. doi: 10.3390/v6041759 PMID: 24747773
- Osterholm MT, Moore KA, Kelley NS, Brosseau LM, Wong G, Murphy FA, et al. *Transmission of Ebola Viruses: What We Know and What We Do Not Know*. *mBio*. 2015; 6: e00137–15. doi: 10.1128/mBio.00137-15 PMID: 25698835
- Pan Y, Zhang W, Cui L, Hua X, Wang M, Zeng Q. *Reston virus in domestic pigs in China*. *Arch Virol*. 2014; 159: 1129–1132. doi: 10.1007/s00705-012-1477-6 PMID: 22996641
- Rouquet P, Froment J-M, Bermejo M, Kilbourn A, Karesh W, Reed P, et al. *Wild animal mortality monitoring and human Ebola outbreaks, Gabon and Republic of Congo, 2001–2003*. *Emerg Infect Dis*. 2005; 11: 283–290. doi: 10.3201/eid1102.040533 PMID: 15752448
- Sagripanti J-L, Rom AM & Holland, LE. *Persistence in darkness of virulent alphaviruses, Ebola virus, and Lassa virus deposited on solid surfaces*. *Arch Virol*. 2010; 155: 2035–2039. doi: 10.1007/s00705-010-0791-0 PMID: 20842393
- Weingartl HM, Embury-Hyatt C, Nfon C, Leung A, Smith G, Kobinger G. *Transmission of Ebola virus from pigs to non-human primates*. *Sci Rep*. 2012; 2: 811. doi: 10.1038/srep00811 PMID: 23155478
- Weingartl HM, Nfon C, Kobinger G. *Review of Ebola virus infections in domestic animals*. *Dev Biol Basel*. 2013; 135: 211–218. doi: 10.1159/000178495 PMID: 23689899
- WHO. *Lassa fever*. WHO [Internet]. 2015 [cited 23 Jul 2015]. www.who.int/mediacentre/factsheets/fs179/en/

Effect of short-term supplementation with ready-to-use therapeutic food or micronutrients for children after illness for prevention of malnutrition

A randomised controlled trial in Uganda

Summary of research¹

Location: *Uganda*

What we know: The potential for nutritional supplementation of sick children as a strategy for preventing malnutrition has not been adequately studied in developing contexts.

What this article adds: A three-armed, partially-blind, randomised controlled trial was conducted in 2,202 sick, non-malnourished children to investigate the effects of RUTF and micronutrient supplementation (two groups) on the incidence of malnutrition in sick children in Uganda. Supplementation was provided during the two-week convalescence period, with monthly follow-up for six months. All groups, including control, received health education. The majority had diarrhoea (63.1%); 29.8% had malaria; and 34.5% had lower respiratory tract infection. The incidence of malnutrition was significantly lower amongst RUTF children compared to controls (33.3% reduction). Weight and MUAC gain were significantly higher for supplemented children. Morbidity and mortality rates during follow-up were not significantly different between groups. Both RUTF and MNP improved nutritional status; however RUTF was more effective in preventing children falling below the threshold of malnutrition. A lower-energy, lower-cost supplement might also be effective in reducing malnutrition where incidence is low. Targeting the intervention to young children may also improve cost-effectiveness.

The potential for nutritional supplementation of sick children as a strategy for preventing malnutrition has not been adequately studied in developing country contexts. A recent Médecins Sans Frontières study investigated whether the incidence of malnutrition among sick children under five years of age could be reduced over a six-month period by providing either a lipid-based, fortified food product or micronutrients during their two-week convalescence period. Two trials, one in Nigeria and one in Uganda, were conducted; this paper reports on the trial that took place in Kaabong, a poor agro-pastoral region of Karamoja in east Uganda. Prevalence of acute malnutrition in Karamoja region in children aged 6-59 months ranges from 8.4 to 11.5% (2-3% severe acute malnutrition); more than half (58%) of the population in the district of Kaabong is considered food insecure.

Methods

This study investigated the effect of two types of nutritional supplementation on the incidence of malnutrition in sick children presenting at outpatient clinics during March 2011 to April 2012 in Kaabong. A three-armed, partially-blind, randomised controlled trial was conducted in children diagnosed with malaria, diarrhoea or lower respiratory tract infection (LRTI). All care and treatment for sickness followed current national medical protocols. Non-malnourished children aged six to 59 months were randomised to one

of three arms: one sachet per day of ready-to-use therapeutic food (RUTF), two sachets per day of standard UN formulation micronutrient powder (MNP), or no supplement (control). The enrolled participants were followed up after the first 14 days and then monthly for six months.

All groups (including the control group) received health education, including the message that following an illness, a child should eat one extra, healthy meal per day for two weeks. Home visitors supported the study by reminding the caretakers to come to appointments, urging absentees to return, and reporting on deaths that occurred at home; any deaths were reviewed by a national doctor and the study team. Compliance was measured by questionnaires and asking the caretakers to return all sachets, empty or full. Three focus group discussions were held during the study period with caretakers who had completed the trial.

The primary outcome was the incidence of first negative nutritional outcome (NNO) during the six-month follow-up. NNO was a study-specific measure used to indicate progression to moderate or severe acute malnutrition; it was defined as weight-for-height z-score < -2, mid-upper arm circumference (MUAC) < 115 mm, or oedema, according to whichever came first.

Findings

Of the 2,202 randomised participants, 51.2% were girls, and the mean age was 25.2 (±13.8)

months; 148 (6.7%) participants were lost to follow-up, nine (0.4%) died, and 14 (0.6%) were admitted to hospital. The majority of participants (63.1%) had diarrhoea on enrolment, 29.8% had malaria and 34.5% had LRTI (more than one disease could be reported). After the onset of illness, caretakers waited an average 2.5 days before seeking help at the clinic.

The incidence of first NNO event during the six-month follow-up for the RUTF, MNP, and control groups were 0.143 (95% confidence interval [CI], 0.107-0.191), 0.185 (0.141-0.239), and 0.213 (0.167-0.272), respectively. The incidence rate ratio was 0.67 (95% CI, 0.46-0.98; $p = 0.037$) for RUTF versus control; a significant reduction of 33.3%. The incidence rate ratio was neither significant at 0.86 (0.61-1.23; $p = 0.413$) for MNP versus control (13.8% reduction) or at 0.77 for RUTF versus MNP (95% CI 0.52-1.15; $p = 0.200$).

The incidence of NNO in the RUTF group was 39.3% lower compared with the control group ($p = 0.037$) and 19.6% lower compared with the MNP group ($p = 0.394$). The incidence in the MNP group was 23.8% lower than the control group ($p = 0.248$).

The average numbers of study illnesses for the RUTF, MNP and control groups were 2.3 (95% CI, 2.2-2.4), 2.1 (2.0-2.3), and 2.3 (2.2-2.5), respectively. The proportions of children who died in the RUTF, MNP and control groups were 0%, 0.8%, and 0.4%.

A total of 166 participants developed moderate malnutrition; 44 (6.09%), 56 (7.7%) and 66 (9.14%), in the RUTF, MNP and control groups respectively. Sixteen participants developed severe malnutrition; 4 (0.55%), 9 (1.24%) and 3 (0.42%), in the RUTF, MNP and control groups, respectively.

The proportion of children having a newly diagnosed episode of diarrhoea or LRTI during the study was similar among the study groups. However, the MNP group had a lower average number of malaria episodes than the control group ($p = 0.001$).

¹ Van der Kam S, Roll S, Swarthout T, Edeyegu-Otelu G, Matsumoto A, Kasujja FX, Casademont C, Shanks L, Salse-Ubach N. (2016) Effect of Short-Term Supplementation with Ready-to-Use Therapeutic Food or Micronutrients for Children after Illness for Prevention of Malnutrition: A Randomised Controlled Trial in Uganda. *PLOS Medicine*. 9 February 2016. DOI:10.1371/journal.pmed.1001951.

Sub-group analyses suggested that the effect of supplementation on the incidence of NNO was not modified by socioeconomic characteristics, season of enrolment, age, breastfeeding status or study disease at enrolment. Both the weight-gain rate and MUAC-gain rate were significantly higher for the supplementation groups compared with the control group. The change in both weight-for-age index and weight-for-height index was also higher for the supplementation groups than the control groups. The change in height and the change in height-for-age index were not different between the supplementation arms. In the first 14 days after the first supplementation, the RUTF and MNP groups showed a significantly higher weight-gain rate compared with the control group and a lower proportion of participants did not gain weight in the supplementation groups. The data shows that both RUTF and MNP improved the nutritional status of the children, but that RUTF was more effective in preventing children falling below the threshold of malnutrition.

Discussion

With the promising results with MNP alone and the clear effect of a high-quality food providing 500 kcal (RUTF), the authors suggest that a supplement with a lower energy content (at a lower

cost than RUTF) might also be effective in reducing incidence of malnutrition, such as lipid-based supplements. From a cost-effectiveness perspective, the authors suggest that further research using these types of products with morbidity surveillance and treatment is warranted.

The findings apply to sick but not malnourished children and cannot be generalised to a wider population including children who are not necessarily sick or who are already malnourished. The companion study in Nigeria showed no reduction in the incidence of malnutrition with short-term supplementation of either RUTF or MNP compared with a control group and there was no impact on any of the anthropometric indices. The authors postulate that the high morbidity in Nigeria necessitates a higher dose or a longer duration of supplementation for effectiveness. The incidence of malnutrition in this population was remarkably low; this may be due to reduced conflict and improved security during the study period.

The effect of supplementation on further morbidity in sick children was mixed and inconclusive. The mortality data are difficult to interpret because of the low numbers and lack of data on the cause of death for those who died at home.

Conclusions

This study showed that a two-week nutrition supplementation programme with RUTF as part of routine primary medical care to non-malnourished children with malaria, LRTI or diarrhoea proved effective in preventing malnutrition in eastern Uganda. The low incidence of malnutrition in this population may warrant a more targeted intervention (such as sick children younger than three years old, or during the hunger season) to improve cost-effectiveness.

While supplementation with MNP showed a positive trend for several nutritional indicators, it appears that a certain level of macronutrients is needed to prevent malnutrition. The authors suggest that further research should focus on an appropriate balance between macro- and micronutrients to optimise the cost-effectiveness of supplementation with lipid-based fortified foods in preventing malnutrition in sick children.

A similar research in Nigeria found very different results (available at: <http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001952>). The analysis and implications of both trials will be discussed in a future edition of Field Exchange.

Data sharing in public health emergencies

A call to researchers

Summary of research¹

Location: *Global*

What we know: Rapid data sharing is critical for decision-makers in public health emergencies, but may prejudice subsequent journal publication.

What this article adds: The Bulletin of the World Health Organisation will implement a new data sharing and reporting protocol specific to articles on the Zika virus outbreak. All submitted articles will be freely available online within 24 hours whilst undergoing peer review. Those accepted will appear in print; those which are not will remain available online as working papers and may be published elsewhere.

An editorial in the Bulletin of the World Health Organisation addresses the issue of data sharing in public health emergencies. Rapid data sharing during an unfolding health emergency is critical for decision-makers. During the recent Ebola epidemic in West Africa, deficiencies were highlighted with existing data-sharing mechanisms. In September 2015, agreement was reached on the need for open sharing of data and results, especially in public health emergencies. This was followed by agreement from the International Committee of Medical Journal Editors (ICJME) that pre publication dissemination of information critical to public health will not prejudice journal

publication in the context of a public health emergency declared by WHO.

The Bulletin of the World Health Organisation will implement a new data sharing and reporting protocol. This is in response to the data gap that exists in responding to the current Zika virus epidemic and will currently apply only to articles submitted in the context of this outbreak. On submission to the Bulletin, all Zika relevant research manuscripts will be assigned a digital object identifier and posted online in the 'Zika Open' collection within 24 hours while undergoing peer review. The data in these papers will thus be attributed to the authors while being

freely available for reader scrutiny and unrestricted use, distribution and reproduction in any medium provided that the original work is properly cited. If the paper is subsequently accepted following peer review, this open access review period will be reported in the final publication. If the paper does not pass peer review, authors will be free to seek publication elsewhere; should the authors not manage to get the paper accepted in any suitable journal, then WHO will publish these papers in its institutional repository as citable working papers, independently of the Bulletin.

The aim of this protocol is to encourage all researchers to share their data as quickly and widely as possible, while still meeting their need to retain authorship, achieve precedence and put their research on the public record. The first paper to which this protocol applies is now available online.

Zika Open is accessible at: www.who.int/bulletin/online_first/zika_open/en/

¹ Dye, C., Bartolomeos, K., Moorthy, V., Kieny, M.P. (2016). *Data sharing in public health emergencies: a call to researchers*. Bulletin of the World Health Organisation. 2016. doi: <http://dx.doi.org/10.2471/BLT.16.170860>

Acceptability and feasibility of a child-feeding toolkit in Malawi

Summary of research

By Ellah Kedera, Meghan Anson, Emily Faerber, Jennifer Weiss and Amy Webb Girard

The authors acknowledge and thank all stakeholders involved in supporting the research highlighted in this article, particularly the Department of Nutrition, HIV and AIDS, Malawi and the World Bank. Special thanks to Concern Worldwide's Health and Nutrition team in the Mchinji District and the study participants for their time and collaboration.



Feeding bowl and slotted spoon

Location: *Malawi*

What we know: Dietary quality and fortification or supplementation is the typical focus of behaviour-change communication around complementary feeding; portion size and food consistency receives less attention.

What this article adds: In collaboration with the Government of the Republic of Malawi and Emory University, Concern Worldwide evaluated infant and young child feeding practices and the feasibility, acceptability and cultural appropriateness of a practical feeding toolkit to improve complementary feeding practices in the Mchinji District. Key informants identified the need for cues in complementary feeding volume, frequency and consistency. The toolkit was well-received. Findings have informed operations research to evaluate and quantify the effectiveness of the toolkit in improving complementary feeding practices (the results are due in September 2016).

Background

In the Mchinji District of Malawi, 53.7% of children under the age of five are stunted, 13.1% are underweight and 3.3% are wasted (National Statistical Office and ICF Macro, 2011); rates exceed national averages and are among the highest in the country. Efforts around child nutrition have failed to meaningfully reduce rates of stunting in Malawi (Scaling Up Nutrition, 2011). The World Bank-funded, government-led, Nutrition, HIV and AIDS Project (NHAP) aims to contribute to a reduction in child stunting and maternal and child anaemia and prevent transmission of HIV and AIDS. This project includes a 'Support to Nutrition Improvement Component (SNIC)' that aims to enhance and scale up maternal and child nutrition service delivery at community level and strengthen sector policy and programme development, management and coordination at central, district and community levels. Concern Worldwide is

Box 1 Feeding toolkit

The toolkit comprises a demarcated feeding bowl, slotted spoon and counselling card. The bowl is designed with symbols and demarcations to denote recommended meal frequencies and quantities of food for children at 6-8 months, 9-11 months, and 12-23 months. Symbols and demarcations on the bowl also cue the extra food recommended for women during pregnancy and lactation. The slotted spoon guides caregivers in preparing complementary food of appropriate consistency. A pictorial counselling card provides pictorial instructions on how to use the toolkit to achieve recommended dietary practices, handwashing practices and dietary diversity. It is suitable for caregivers with low literacy.

the SNIC non-governmental organisation (NGO) implementing partner in the Mchinji District, one of 15 SNIC districts in Malawi.

As part of the SNIC project in Mchinji and in collaboration with Malawi's Department of Nutrition, HIV and AIDS and Emory University, Rollins School of Public Health, Concern Worldwide is conducting operations research to evaluate the effectiveness of a feeding toolkit (demarcated feeding bowl, slotted spoon and counselling card) to improve complementary feeding practices among families with children aged six to 23 months in three target traditional authorities (TAs): Zulu, Mduwa, and Mkanda. The toolkit was designed by a team of students and faculty from Rollins School of Public Health and the Georgia Institute of Technology. Previous testing in India and Kenya indicated the toolkit was acceptable and had the potential to shift dietary practices (Collison et al, 2015), (Kram et al

2015). As part of the larger research goal, formative research was conducted to evaluate current infant and young child feeding (IYCF) practices in the Mchinji District and to assess the acceptability and feasibility of the feeding toolkit to enhance complementary feeding of children aged six to 23 months, including potential barriers to use and optimal delivery platforms. Key findings are summarised here.

Methodology

This cross-sectional, qualitative study was conducted from July-August 2015 through focus group discussions (FGDs) in two TAs, one peri-urban and one rural. Participants comprised the following target groups:

- Pregnant women and caregivers of children aged six to 23 months;
- Fathers of children aged six to 23 months;
- Care group lead mothers (community volunteers);
- Community leaders, including administrative and religious leaders, female representatives, farmers, businessmen and community health promoters; and
- Facility-based healthcare workers.

FGD guides were developed for each target group and translated into Chichewa. Topics included beliefs and current practices related to maternal nutrition, IYCF, influencers of maternal and child nutrition, perceived benefits and challenges of the feeding toolkit and potential delivery platforms. Ten FGDs were conducted, one with each target group in each TA. The number of participants in each focus group discussion ranged from four to 15. A total of 103 individuals – 63 females and 40 males – participated in the study.

Findings

Key findings regarding IYCF practices were:

- All participants knew that foods from the six food groups should be introduced to children at six months of age; thin, watery maize porridge seasoned with groundnut flour was typically introduced at six months, with more variety and texture introduced at nine months. Gardening, fetching water and engaging in casual labour were identified as barriers to more diversified diets.
- Estimating portion size of complementary food was difficult, depending on age and size of child, amount typically consumed, food availability and seasonality. This led to under/over estimates in practice.
- While several mothers could describe recommended, age-appropriate meal frequency, in practice most indicated their infants received two meals a day, regardless of infant age, with some feeding three times a day. Mothers indicated meal frequency was influenced by food availability and food type; snacks were only provided if available.
- Facility-based healthcare workers, grandmothers, lead mothers, community health promoters and husbands all influence IYCF practices by the mother.

In terms of feedback on the toolkit:



David Orr, WFP

- The counselling card was clear and participants could identify the messages and food items. Suggestions to improve the toolkit were larger text and use of culturally-appropriate food items.
- The feeding bowl was considered appropriate and useful and was perceived to reduce food waste.
- The toolkit was considered as having benefits in promoting appropriate complementary feeding and thus preventing malnutrition. Community sensitisation and training of lead mothers and healthworkers was considered key.
- Identified barriers to uptake were inability to purchase nutritious foods, staining of the bowl and communal eating.
- Lead mothers, facility-based healthcare workers, fathers and community leaders all saw benefits of the toolkit within their areas of responsibility/concern around IYCF.
- Three distribution channels were identified for the feeding toolkit: 1) Lead mothers (identified by caregivers and fathers); 2) Community leaders (self-identified as the source for lead mothers); 3) Facility-based healthcare workers (self-identified, to act as an incentive for mothers and children to attend antenatal health/welfare clinics).
- All felt it should be provided at no cost (if necessary to charge, a subsidised cost of 50-150 Malawian Kwacha [£0.05-0.16] was suggested).

Recommendations

Programmatic recommendations include community sensitisation prior to roll-out; develop-

ment of a feeding toolkit training guide for programme staff, community health promoters and lead mothers; and formulation of follow-up mechanisms within programmes to ensure proper use of the toolkit. The feeding toolkit should be deployed in conjunction with programmes or interventions aimed at improving household food security. Grandmothers, mothers-in-law and husbands should be targeted as part of behaviour-change programmes.

These findings have informed the ongoing operations research to evaluate and quantify the effectiveness of the feeding toolkit to improve complementary feeding practices. Results from the Mchinji District Feeding Bowl Trial will be available in September 2016.

For additional information, please contact Meghan Anson,
email: meghan.anson@concern.net

References

- Collison D.K., Kekre P., Verma P., Melgen S., Kram N., Colton J., Blount W. & Webb Girard A., 2015. *The acceptability and utility of an innovative feeding toolkit to improve maternal and child diet practices in Bihar, India. Food and Nutrition Bulletin*. pp24-32.
- Kram N., Melgen S., Kedera E., Collison D.K., Colton J., Blount W., Grant F. & Webb Girard A., 2015. *The acceptability of dietary tools to improve maternal and child nutrition in Western Kenya. Public Health Nutrition*, pp1-11.
- National Statistical Office and ICF Macro, 2011. *Malawi Demographic and Health Survey 2010*. Zomba, Malawi, and Calverton, Maryland, USA: NSO and ICF Macro.
- Scaling Up Nutrition, 2011. *SUN 1000 Special Days 2011-2016, National Education and Communication Strategy for Preventing Child Stunting in Malawi*. Lilongwe 3: The Government of Malawi; Office of the President and Cabinet, Department of Nutrition, HIV, and AIDS.

Ten steps to successful breastfeeding programme in DRC

A cluster-randomised controlled trial

Summary of research¹

Location: *DRC*

What we know: Whilst most mothers initiate and continue breastfeeding in DRC, exclusive breastfeeding rates remain low.

What this article adds: A recent trial cluster-randomised controlled trial in an urban clinic setting investigated the effect on breastfeeding outcomes in infants under six months of an abbreviated Ten Steps to Successful Breastfeeding programme delivered by trained antenatal clinic staff. Antenatal clinic attendance in control and intervention groups was good. Implementation of steps 1-9 tripled the prevalence of exclusive breastfeeding at six months of age compared to controls (36% v 12%) and was associated with a significant reduction in diarrhoea prevalence compared to standard care. There was no impact on early initiation of breastfeeding. Additional support offered during well-child visits (steps 1-10) did not enhance the effect and may have lessened it. The findings suggest that in settings with high breastfeeding initiation, the provision of quality breastfeeding support to mothers in clinical settings might be as effective as the provision of community support through peer counselling.

Optimisation of breastfeeding practices could reduce high mortality rates in children under five years old. In the Democratic Republic of the Congo (DRC), despite near-universal breastfeeding initiation and nine out of ten children still breastfeeding at one year of age, exclusive breastfeeding in infants under six months remains elusive. This study assessed the effect on breastfeeding outcomes of implementing a short-cut version of the Ten Steps to Successful Breastfeeding programme, the key component of the Baby-Friendly Hospital Initiative (BFHI) (see Box 1). The short-cut version does not require the usual accreditation from BFHI; this study aimed to test whether this programme would be as effective as the accredited version and could more easily be scaled-up.

Methods

The study involved a cluster-randomised controlled trial that randomly assigned healthcare clinics in the urban centre, Kinshasa, to one of three groups: standard care (control group); BFHI steps 1-9 (steps 1-9 group); or BFHI steps 1-9 plus additional support during well-child visits (steps 1-10 group). Computer-generated random numbers were used to assign matched pairs to study groups. Mothers at these clinics who had given birth to one healthy baby during enrolment and who expressed the intention to visit a well-baby session at the same clinic were eligible and received the treatment assigned to their clinic. Mother-infant

pairs were excluded if the mothers intended to attend well-baby clinic visits at a different health facility, or to travel before the child was least six months old. Participants and independent interviewers were masked to group assignment (i.e. they were recruited after randomisation and training of the clinic staff and were not informed of the study scheme), but clinical staff were unmasked.

BFHI steps 1-9 and 1-10 were given by health-care staff trained using the WHO/UNICEF BFHI course. The steps 1-10 group also received flyers in local languages containing culturally appropriate messages addressing behaviours that contribute to sub-optimal breastfeeding practices (such as giving the baby water in the first six months of life). The primary outcomes were breastfeeding initiation within one hour of birth and exclusive breastfeeding at 14 and 24 weeks, assessed at face-to-face interviews in the clinic using both 24-hour and seven-day recall. Two secondary outcomes were assessed: the prevalence of infants with reported diarrhoea and the prevalence with reported respiratory illness (fever with cough) between 10 and 14 weeks and between 18 and 24 weeks post-partum. The researchers undertook intention-to-treat analysis, complete-case analysis and per-protocol analysis. Prevalence ratios (PR) were adjusted for cluster effects and baseline characteristics.

Results

Between May 24 and Aug 25 2012, the authors randomly assigned two eligible clinics to control, two clinics to BFHI steps 1-9, and two clinics to BFHI steps 1-10. A total of 965 mother-infant pairs were eligible. Few imbalances in baseline characteristics were noted between the intervention and control groups. Mothers in the control group were slightly older and more likely to have attended at least four antenatal visits compared with mothers in the two intervention groups. Most missed no more than one visit in all groups. With the exception of one week post-partum, attendance was consistently higher in the control group than in the intervention groups throughout the study; this difference was sig-

Box 1 Ten Steps to Successful Breastfeeding

The Ten Steps to support successful breastfeeding serve as the basis for the Baby-Friendly Hospital Initiative. The steps are:

1. Having a written breastfeeding policy that is routinely communicated to all healthcare staff;
2. Training all healthcare staff in skills necessary to implement the policy;
3. Informing all pregnant women about the benefits and management of breastfeeding;
4. Helping mothers to initiate breastfeeding within 30 minutes of birth;
5. Showing mothers how to breastfeed and maintain lactation, even if they are separated from their infants;
6. Giving newborn infants no food or drink other than breastmilk, unless medically indicated, and not accepting free or low-cost breastmilk substitutes, feeding bottles, or teats;
7. Allowing mothers and infants to remain together 24 hours per day;
8. Encouraging breastfeeding on demand;
9. Giving no artificial teats or pacifiers to breastfeeding infants; and
10. Fostering the establishment of breastfeeding support groups and referring mothers to them on discharge from a hospital or clinic.

¹ Yotebieng M, Labbok M, Soeters HM, Chalachala JM, Lapika B., Vitta BS, Behets F. (2015). Ten steps to successful breastfeeding programme to promote early initiation and exclusive breastfeeding in DR Congo: a cluster-randomised controlled trial. *Lancet Global Health* 2015; 3: e546-55.

nificant only at the week six visit. Baseline characteristics did not differ between mother-infant pairs who attended follow-up visits and those who did not.

A selection of findings from the intention-to-treat analysis is summarised in Table 1. There was no significant group differences in breastfeeding within one hour of birth. However, the prevalence of exclusive breastfeeding at 14 weeks was significantly higher in both the steps 1-9 and in the steps 1-10 group. At 24 weeks, the prevalence of exclusive breastfeeding was significantly higher than the control in the steps 1-9 group only; in fact, it was three times higher than the control group and 2.6 times higher than the steps 1-10 group.

Prevalence of diarrhoea increased between week 14 and week 24 in all groups (see Table 1). The prevalence of diarrhoea at 14 weeks was similar between the control and steps 1-9 groups, but significantly higher than control in the steps 1-10 groups. The prevalence of diarrhoea at 24 weeks was significantly lower in the steps 1-9 group (8%), having similarly risen in the control (15%) and steps 1-10 groups (18%). No significant differences between groups were noted in the prevalence of reported respiratory infections at 14 or 24 weeks.

Discussion

In the setting of healthcare clinics in DRC with a high proportion of mothers initiating breastfeeding, implementation of basic training in BFHI steps 1-9 had no additional effect on initiation of breastfeeding, but significantly increased exclusive breastfeeding at six months of age (three times higher than for the control group). This finding is consistent with other recent research (PROMISE trial in South Africa; Tylleskär et al, 2011) and suggests that, in settings with



high breastfeeding initiation, the provision of quality breastfeeding support to mothers in clinical settings might be as effective as the provision of community support through peer counselling. The common practice of supplementing breastfed infants with water in an environment where only 23% of the urban popu-

lation has access to improved sanitation facilities and less than 50% to improved sources of drinking water could account for some of the increased risk of diarrhoea where infants are not exclusively breastfed.

Additional support based on the same training materials and locally available breastfeeding support materials, offered during well-child visits (i.e. step 10), did not enhance this effect as expected, and might have actually lessened it. The authors postulate that that the materials used might not have provided the accurate or necessary messages for this setting, or that engagement of family members might have led to misunderstandings or incorrect advice that were not sufficiently countered by group counselling from nurses during well-child visits.

The implementation of BFHI steps 1-9 by training health personnel with the WHO/UNICEF course – a fairly low-intensity, low-tech intervention that is very suitable for rapid scale-up in maternity settings – significantly raised the proportion of infants exclusively breastfeeding at six months old and decreased diarrhoea prevalence by half at this age. The authors suggest that large-scale implementation of steps 1-9 in similar settings could help to reduce mortality quickly in children under five years old.

Table 1 Selection of results, intention-to-treat analysis (24-hour recall data)

	Control	BFHI steps 1-9	BFHI steps 1-10
No. of eligible mother-infant pairs	304	363	308
	% (n)	% (n) <i>Adjusted prevalence ratio (95% CI)</i>	% (n) <i>Adjusted prevalence ratio (95% CI)</i>
Breastfed within one hour of birth	230 (76%)	263 (72%) 1.01 (0.79-1.30)	220 (71%) 0.98 (0.73-1.32)
Prevalence of exclusive breastfeeding at 14 weeks	89 (29%)	237 (65%) 2.20 (1.73-2.77)	129 (42%) 1.40 (1.13-1.74)
Prevalence of exclusive breastfeeding at 24 weeks	36 (12%)	131 (36%) 3.50 (2.76-4.43)	43 (14%) 1.31 (0.91-1.89)
Diarrhoea since last visit at 14 weeks	14 (5%)	18 (5%) 1.03 (0.63-1.67)	27 (9%)
Diarrhoea since last visit at 24 weeks	45 (15%)	28 (8%) (0.34-0.73)	56 (18%)

References

Tylleskär T, Jackson D, Meda N, et al 2011. *Exclusive breastfeeding promotion by peer counsellors in sub-Saharan Africa (PROMISE-EBF): a cluster-randomised trial.* *Lancet* 2011; 378: 420-27

Weight-for-height and MUAC used independently to diagnose acute malnutrition

Policy implications

Summary of research¹



Amanda Maust, Malawi, 2013

Location: *Global*

What we know: Overlap between mid-upper arm circumference (MUAC) and weight-for-height Z-scores (WHZ) when assessing acute malnutrition (AM) prevalence varies by country. This has significant implications for programming.

What this article adds: A recent study examined the direction and degree of discrepancy between MUAC and WHZ of children aged 6-59 months in 1,832 anthropometric surveys from 47 countries, mainly in Africa. Overall, using MUAC or WHZ, 16.3% of children were identified with global acute malnutrition (GAM) and 3.5% with severe acute malnutrition (SAM). The proportion of overlap between the two indicators was 28.2% for GAM (15-38.5%) and 16.5% for SAM (6.1-29.8%). Overlap for individual countries was especially low for SAM. The numbers of children diagnosed by either criterion varied dramatically by country: GAM varied from minus 57% to plus 72%. For SAM, in four of the 38 countries, less than 25% of severely malnourished children would be identified and admitted for treatment if a MUAC-only admission policy were being used. Overall, 41% of children were younger than 26.5 months and 61% were shorter than expected. For all countries examined, the discrepancies were not adequately explained by any single hypothesis. The authors argue that MUAC-only criteria may not be appropriate where WHZ deficits predominate, and in such contexts recommend that both indicators are used as admission criteria.

Background

In 2009, WHO estimated about a 40% overlap between mid-upper arm circumference (MUAC) and weight-for-height Z-scores (WHZ) when assessing acute malnutrition (AM) prevalence; this is observed to vary by country. To test this, a recent study examined the relationship between MUAC and WHZ for admission to treatment programmes, since this has implications for programming cost, workload, case detection, coverage and treatment.

Methods

Anonymous data were collected from 1,832 anthropometric surveys with over 75 malnourished children from 47 countries in Africa (1,619), Asia (166), Central America (two) and the Caribbean (45) between 1986 and 2014 with children measured aged from six to 59 months. Eleven additional surveys from eight countries where fewer malnourished children were identified were also analysed. Most of the surveys used two-stage, cluster sampling. All surveys followed standard WHO methods for measuring weight, height and MUAC. Indices were calculated using Emergency Nutrition Assessment (ENA) software for Standardised Monitoring and Assessment of Relief and Transitions (SMART).

The prevalence of global acute malnutrition (GAM) and severe acute malnutrition (SAM) was calculated using either absolute MUAC or WHZ (WHO 2006 standards). For each country, the total number of children diagnosed as acutely malnourished by either criterion alone or by both criteria was summed from all the surveys conducted in that country.

Results

Of the original 1,404,396 children with plausible data in the 1,832 surveys, 0.49% were excluded for oedema and 1.4% were then excluded using SMART flags, leaving a total of 1,384,068 children. Most of the children (88.1%) were from an African country. Key findings were as follows.

Overall, 16.3% of children were identified with GAM by either $WHZ < -2SD$ or $MUAC < 125$ mm and 3.5% were identified as having SAM by either $WHZ < -3SD$ or $MUAC < 115$ mm. The proportion of overlap between the two indicators was 28.2% for GAM and 16.5% for SAM, with analysis of all the children from surveys with more than 75 malnourished children. The degree of overlap ranged from 15.0% in Sri Lanka to 38.5% in Sierra Leone for GAM and 6.1% in Sri Lanka to 29.8% in Mozambique for SAM. For

the 47 individual countries, the degree of overlap was consistently low (GAM: $29.9 \pm 15.3\%$, SAM $16.0 \pm 5.4\%$, mean \pm SD), as reflected in Figure 1. The overlap was much smaller for SAM than for GAM.

There were slightly fewer countries in this analysis that had a higher proportion of children malnourished by MUAC-only than by WHZ-only (GAM 19 vs 28 countries; SAM 18 vs 20). The numbers of children diagnosed by one criteria or the other varied dramatically from one country to another:

- For GAM, the difference ranged from minus 57% to plus 72%; thus, in 11 countries, more than 75% of malnourished children would be identified using MUAC-only criteria, whereas in nine countries, including the Philippines, Sri Lanka and Senegal, less than 25% of malnourished children would be selected if only MUAC were used as the admission criterion.
- For SAM, the difference is even more dramatic. MUAC would not identify more than 75% of severely malnourished children in any country in which more than 75 SAM children were identified. In four of the 38 countries, less than 25% of severely malnourished children would be identified and admitted for treatment if a MUAC-only admission policy were being used (13% would be identified in Sri Lanka and 14% in Senegal).

Overall, only 41% of the children were younger than 26.5 months (the proportion never reached 50%); however, 61% of the children were shorter than would be expected for a child of 26.5 months growing normally. There is a tendency for there to be fewer children diagnosed as GAM by WHZ when there are more short children. The regression is significant ($r^2 = 0.19$, $P < 0.01$, $y = 67.5 - 0.14x$). There is no relationship between the age distribution of the children and the relative importance of WHZ or MUAC for diagnosis of GAM ($r^2 = 0.00$).

¹ Grellety E, Golden, MH, 2015. Weight-for-height and mid-upper arm circumference should be used independently to diagnose acute malnutrition: policy implications. BMC 2016 2:10. DOI: 10.1186/s40795-016-0049-7

Discussion and recommendations

The authors discuss a number of potential hypotheses and outstanding questions regarding the results.

Firstly, shorter or younger children are more likely to fall below the absolute cut-off point for MUAC. As the age categories did not differ significantly from one country to another, this does not adequately explain the different directions of the discrepancy observed.

Second, in countries where the children are more stunted, a higher proportion of children will have a MUAC below the cut-off point at any particular WHZ prevalence, simply because they are smaller. While there is a tendency for countries with more stunted children to have more diagnosed as AM by MUAC alone, the association is very weak, with only about 19% of the variation explained on this basis.

Third, absolute MUAC is less dependent on body proportions than WHZ, which may overestimate AM in children with a low sitting-to-standing height ratio (SSR) and underestimate those with relatively short limbs (legs weigh less than the torso). The study data does not support the explanation of variations in limb length accounting for the discrepancies between predominantly WFH or MUAC criteria.

Fourth, many studies have documented ethnic differences in fat distribution or 'patterning' in normally nourished populations. The effect of malnutrition on the relative loss of fat from the limbs and trunk and proportional loss of muscle from various body muscles is unknown. Thus, muscle and fat losses may affect MUAC and WHZ differentially.

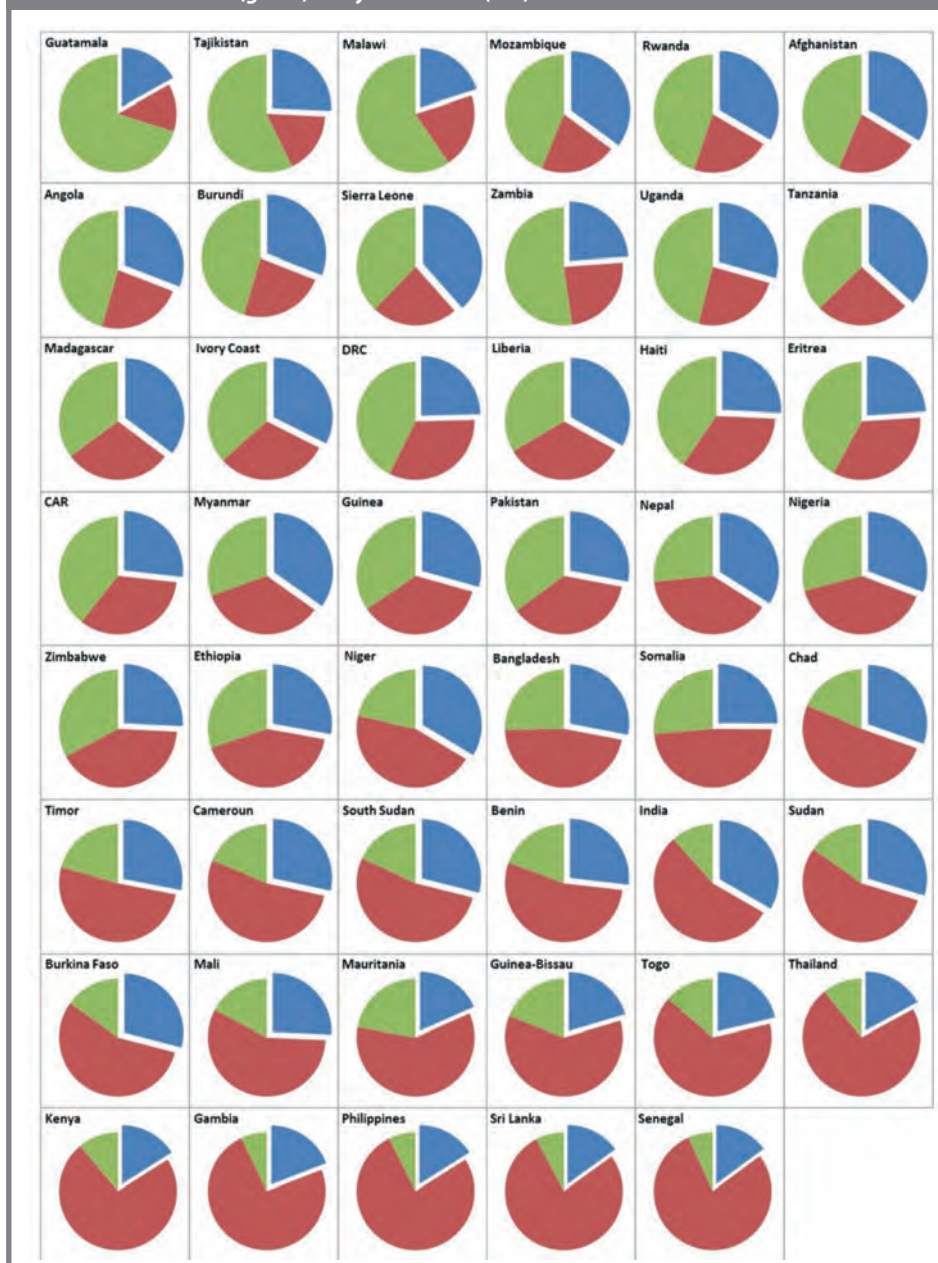
Fifth, different population body shapes (endomorph, mesomorph and ectomorph) might explain only some of the discrepancy observed.

The relationship between MUAC and WHZ is complex. It is probable that the factors outlined affect some of the populations but not others; in combination they generate the discrepancy. More understanding of the factors at play is needed before a decision is made to abandon WHZ as an independent criterion for the diagnosis of acute malnutrition.

The authors argue that the superior power of MUAC to predict mortality risk in children is a strong argument for MUAC-only admission criteria if it predicts the death of the same children that WHZ would identify. However, since the two variables appear to identify different children, this will not be the case and it might be more helpful to consider the two indicators as complementary and additional, a hypothesis supported by the higher risk of death of those children with both MUAC and WHZ deficits (Isanaka et al, 2015). Furthermore, addition of other deficits such as a low height-for-age or weight-for-age progressively increase the risk of death.

The authors ask whether recent longitudinal studies of mortality risk conducted mostly in

Figure 1 Pie charts of individual countries showing the proportion of children with GAM diagnosed by both MUAC < 125 mm and WHZ < -2SD (blue) or by MUAC alone (green) or by WHZ alone (red)



Bangladesh and Malawi are applicable globally, given the variations observed in this study's analyses; the move towards using MUAC-only criteria may be appropriate for some countries but not for others, such as in Asia, where WHZ deficits predominate. WHZ as an independent admission criterion should be maintained until mortality risks are adequately assessed. The authors also propose that all future anthropometric surveys, including national DHS surveys, should include measurement of both MUAC and WHZ (and oedema) and report the prevalence of GAM and SAM using both MUAC and WHZ.

Conclusion

For all countries examined, the discrepancies observed between the indicators were large and not adequately explained by any single hypothesis. The perceived need for humanitarian intervention can be affected by the measurement chosen to assess the prevalence of malnutrition, which will

vary from region to region. The dramatic difference in prevalence between countries using the two diagnostic criteria will influence decision-making and the distribution of resources. The authors conclude that WHZ and MUAC are complementary indicators that should both be used independently to guide admission for treatment of malnourished children. Using WHZ-only or MUAC-only estimates of prevalence will underestimate the burden of acute malnutrition.

References

- Isanaka S, Guesdon B, Labar AS, Hanson K, Langendorf C, Grais RF, 2015. *Comparison of Clinical Characteristics and Treatment Outcomes of Children Selected for Treatment of Severe Acute Malnutrition Using Mid Upper Arm Circumference and/or Weight-for-Height Z-Score*. PLoS One. 2015;10(9):e0137606.
- Grellety E, Golden, MH, 2015. *Weight-for-height and mid-upper-arm circumference should be used independently to diagnose acute malnutrition: policy implications*. BMC 2016 2:10. DOI: 10.1186/s40795-016-0049-7

Nutrition needs and best practices for formerly trafficked female children and adolescents



In Asia, criminal networks profit from forcing people to work on boats, in brothels and in other dangerous and demeaning conditions.

fang Chhin Sothy/AFP

By Erin Liseiby

Erin Liseiby is a registered dietitian/nutritionist currently working with the US Special Supplemental Nutrition Program for Women, Infants and Children (WIC) mobile outreach programme. She has volunteered as a consultant for an anti human-trafficking organisation in Cambodia.

The United Nations defines human trafficking as “the recruitment, transportation, transfer, harbouring, or receipt of persons by improper means (such as force, abduction, fraud, or coercion) for an improper purpose including forced labour or sexual exploitation.” (UN, 2015). In 2009, the UN published a global report that stated sexual exploitation makes up 79% of human trafficking and the majority of victims are women and girls (UN ODC, 2009).

A recent technical literature review (Liseiby) highlights a gap in research regarding the health needs of formerly trafficked female children and adolescents, with a specific focus on the Southeast Asian population. Although evidence is limited, what exists indicates common conditions of trafficking to include physical, sexual and psychological abuse, as well as neglect and deprivation (Oram et al, 2012). These can result in multiple health consequences, including malnutrition. The most commonly reported post-trafficking physical health symptoms are fatigue, headaches, sexual and reproductive health problems, back pain, significant weight loss, dizziness, memory loss, abdominal pain and dental problems.

For formerly trafficked girls in Southeast Asia, it is important to recognise their nutrition status prior to being trafficked. According to WHO, 70% of the world’s malnourished children are in Asia; anaemia, vitamin A deficiency and iodine deficiency are significant problems in this region (WHO, 2015). The severity of malnutrition in formerly trafficked females also depends on the brutality of treatment and the duration of time trafficked. There is a lack of substantial research on how physical health needs vary in relation to demographics or the characteristics of trafficking experiences; individual-level assessment and care is needed.

Nutrition needs for children and adolescents

Specific nutrient recommendations are not available for the formerly trafficked child and adolescent population, but population-based nutrition needs for this demographic can be applied. During adolescence, nutrient needs are higher than at any other time in life and full growth potential can only be reached through optimum nutrition. As a female goes through puberty, her weight and height increases, skeletal growth is completed, bone mass increases and the body begins to

change in composition. Protein needs are highest between the ages of 11-14 years due to growth and increase of muscle mass. Calcium needs are greater during childhood and adolescence because of the large increase in skeletal growth. Iron needs for females increase with the start of menstruation because of rapid growth and the expansion of blood volume and muscle mass. Poor iron status during adolescence is linked to poor cognitive development into adulthood, so this nutrient needs particular attention in the formerly trafficked population. Folic acid (folate) needs are higher during adolescence because it is necessary for protein synthesis, which is increased during times of growth.

Malnutrition can be identified during a physical exam of a formerly trafficked child or adolescent and treated in accordance with international guidelines, including micronutrient supplementation where indicated. Wounds and physical injuries will increase nutrient requirements during recovery. Consideration of longer-term nutrition that centres on a nutritionally balanced and adequate diet is also needed.

Mental health

Significant mental health problems found in this population include depression, post-traumatic stress disorder (PTSD), other anxiety disorders, suicidal thoughts and disabling physical pain or dysfunction. For children, mental and emotional health is the greatest concern; prolonged physical, mental and emotional stress can cause cognitive and emotional developmental delays and possible developmental regression. When a child is undernourished, delays and regression can be more severe. Due to the prevalence of anxiety and depression in formerly trafficked children and adolescents, there is also a risk of short and long-term mood disorders, characterised by depression, anxiety, agitation, irritability, phobias, sleep and appetite disturbances, and physical signs such as fatigue, headaches and abdominal pain. Adolescent females with depressive symptoms have a higher chance of developing eating and/or substance-abuse disorders.

HIV

In 2009, the UN Development Project found no cases of HIV among formerly trafficked females in Cambodia. However, they estimated that around 75,000 people in Cambodia and 610,000 in Thailand were living with HIV in 2007 (Silverman et al, 2009). There is very little evidence

to link HIV prevalence and human trafficking, but due to the nature of trafficking and the high rates of HIV in Southeast Asian countries, it is clear this population is at risk. Females who are trafficked are at a higher risk of contracting HIV due to their inability to refuse unprotected sex or negotiate condom use. The immature reproductive tracts of younger women can also facilitate HIV transmission. Although not every formerly trafficked child and adolescent may present with HIV, there is risk of transmission during trafficking experiences. Understanding the specific nutrition needs of individuals with HIV will increase the quality of care given during post-trafficking rehabilitation and recovery.

Pregnancy

In 2013, UNICEF reported that 23% of adolescent girls in the developing world give birth before age 18. In Asia, these rates are up to 40% and appear to be rising in some areas (Bhabha, 2013). Girls in trafficking are at an even higher risk of unwanted pregnancy. Giving birth as an adolescent female poses major risks to the female and the child. Pregnancy during these years puts a female at risk for pregnancy complications, which increase teenage morbidity and mortality. Giving birth at a younger age also increases the risk of infant mortality and childhood stunting and wasting. The female must meet her own nutritional needs for the growth that occurs during adolescence as well as foetal needs (Dasra, 2011). Iron, calcium, and folic acid (folate) is indicated. Low weight before pregnancy can increase risk for complications during pregnancy and poor outcomes for the child.

Conclusion

The health needs of formerly trafficked children and adolescents are diverse and significant. It is necessary to assess for undernutrition prior to or during their trafficking experience; to consider the particular nutrition demands of the child or adolescent; and to consider the other health outcomes that can also impact an individual’s nutrition status and needs. These include mental health conditions, mood and/or eating disorders, HIV/AIDS and pregnancy. More research is needed to determine specific nutrient requirements and support for individuals recovering from a trafficking experience.

For more information, contact: Erin Liseiby, email: erinliseiby@gmail.com

References

Bhabha J. *Adolescents: Current Rights for Future Opportunities*. South-South Cooperation for Child Rights Working Paper 2. UNICEF ROSA and UNICEF EAPRO. 2013.

Dasra 2011. *Owning Her Future: Empowering Adolescent Girls in India*. Dasra, India and the Kiahawa Trust, 2011: 11. www.britishtasiantrust.org/wp-content/uploads/2012/05/owning-her-future-empowering-adolescent-girls-in-india-dasra.pdf

Lisemby E, *Nutrition Needs & Best Practices for Formerly Trafficked Female Children & Adolescents*, RDN, Hope for

Justice Nutrition Intern. November 2015.

Oram S, Stöckl H, Busza J, Howard L & Zimmerman C. 2102. *Prevalence and risk of violence and the physical, mental, and sexual health problems associated with human trafficking: systematic review*. *PLoS Med*. 2012; 9(5): 1-13.

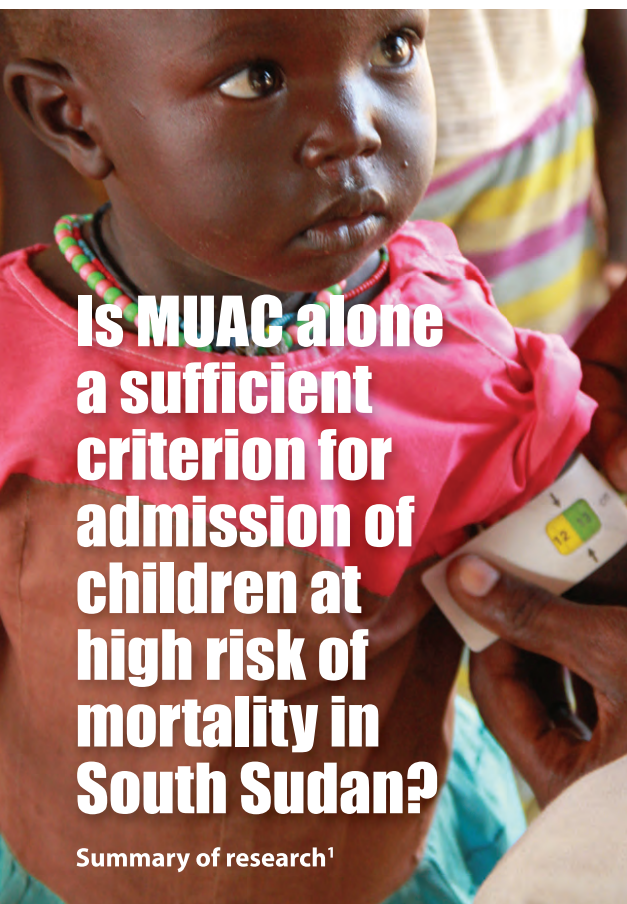
Silverman J, Decker M, McCauley H & Mack K. *A regional assessment of sex trafficking and STI/HIV in Southeast Asia: connections between sexual exploitation, violence and sexual risk*. UNDP Regional Centre in Colombo, 2009.

UN 2015. *UN Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children, supplementing the*

United Nations Convention against Transnational Organized Crime. New York, 15 November 2000. www.unodc.org/unodc/en/treaties/CTOC/index.html Accessed 1 May 2016.

UN ODC 2009. *UN Global Initiative to Fight Human Trafficking. Global report on trafficking in persons*. UN Office on Drugs and Crime, 2009. www.unodc.org/documents/Global_Report_on_TIP.pdf

WHO 2015. *South-East Asia Regional Situation*. World Health Organization. www.searo.who.int/entity/nutrition/topics/regional_situation/en/ Accessed 18 Nov 2015.



Is MUAC alone a sufficient criterion for admission of children at high risk of mortality in South Sudan?

Summary of research¹

Location: *South Sudan*

What we know: The operational implications of using MUAC as the sole anthropometric admission criterion to therapeutic feeding programmes are uncertain.

What this article adds: A retrospective analysis of routine outpatient treatment programme data of children with uncomplicated SAM aged 6-59 months compared patient characteristics of children admitted under MUAC<115mm alone v. children admitted under weight for height z score < -3 (MUAC>115mm). The study shows that MUAC < 115mm identified more severely malnourished, more female and younger age children with a higher risk of mortality, but failed to identify a third of the children who died (98% were identified by WHZ < -3 alone and 100% by MUAC < 130mm). Adjusting for age and sex, the risk of death was over four times higher among children admitted with MUAC<115mm. The greater sensitivity of WHZ < -3 to identify nearly all deaths observed in this study could be specific to this population. Increasing the admission threshold to MUAC < 125mm would identify nearly all deaths but has programming implications.

Following endorsement of the community management of acute malnutrition (CMAM) model by United Nations (UN) agencies in 2007, programming has been widely scaled up across many countries. Current guidelines recommend three admission criteria to therapeutic feeding for children 6-59 months; i) weight-for-height Z-score (WHZ) < -3 (WHO growth standards 2006), ii) mid-upper arm circumference (MUAC) <115mm, or iii) presence of bilateral oedema. Recent years have seen the move towards using MUAC as the sole anthropometric admission criterion due to its simplicity of measurement and use. Transition to a single MUAC criterion for admission to therapeutic feeding is, however, complicated by MUAC and WHZ selecting different children at risk of acute malnutrition. The objective of this study was to describe the operational implications of using MUAC as a single admission criterion for treatment of severe acute malnutrition (SAM) in South Sudan.

Design

The authors performed a retrospective analysis of routine programme data of children with uncomplicated SAM aged 6-59 months, admitted to an MSF outpatient therapeutic feeding programme (TFP) in Aweil, South Sudan in 2010. In order to understand the implications of using MUAC as a single admission criterion, the study compared patient characteristics and treatment outcomes for children admitted with MUAC <115 mm irrespective of WHZ (MUAC+ group) v. children admitted with WHZ < -3 and MUAC >115mm (MUAC -/WHZ+group). Treatment protocols were according to national guidelines and treatment outcomes were defined for all children as one of death, default, transfer or recovered.

Results

Of 2205 children included for analysis, median age was 14 months (interquartile range=10-24 months) and 53% were male. A total of 719 (32.6%) were admitted to the programme with MUAC < 115mm and 1486 (67.4%) with WHZ < -3 and MUAC >

115mm. Children in the MUAC+ group were more severely malnourished (average MUAC 107.3mm and average WHZ -4.3, compared to 122.5mm and -3.8 in the MUAC -/WHZ+group), and more likely to be female and younger. Children in the MUAC+ group were less likely to recover (54% v. 69%) and had higher risk of death (4% v. 1%) but responded to treatment with greater weight and MUAC gains. Adjusting for age and sex, the risk of death was over four times higher among children admitted with MUAC<115 mm compared with the MUAC -/WHZ+group (risk ratio=4.02; 95% CI 2.10, 8.08). MUAC < 115 mm would have failed to identify 33% (n=13) of deaths, while 98% (n=39) were identified by WHZ < -3 alone and 100% (n=40) by MUAC < 130mm.

Conclusions

The study shows that MUAC < 115mm identified more severely malnourished, more female and younger aged children with a higher risk of mortality, but failed to identify a third of the children who died. The greater sensitivity of WHZ < -3 to identify nearly all deaths observed in this study could be specific to the study context (the Nilotic population who have a tall slim body shape, associated with low WHZ) and therefore cannot be assumed to have high external validity. The authors suggest that an upward adjustment of the MUAC admission threshold to MUAC < 125mm could be applied to identify nearly all deaths (e.g. 95%) in this setting. Any such upward adjustment would yield a more sensitive, but less specific criterion for admission and would have important programmatic implications including increased workload and costs. The authors conclude by stating that admission criteria for therapeutic feeding should be adapted to the programmatic context with consideration for both operational and public health implications.

¹ Grellety, E., Krause, L. K., Eldin, M. S., Porten, K., and Isnaka, S. (2015). Comparison of weight-for-height and mid-upper arm circumference (MUAC) in a therapeutic feeding programme in South Sudan: is MUAC alone a sufficient criterion for admission of children at high risk of mortality? *Public Health Nutrition* (2015) doi: 10.1017/S1368980015000737.

Auditing the identification and inpatient management of acute malnutrition in infants under six months in Malawi

Summary of MSc thesis

By Laura White

Laura White is a Canadian-trained registered dietitian who recently completed an MSc in Nutrition for Global Health at the London School of Hygiene and Tropical Medicine. She is currently working in Papua New Guinea as a clinical nutrition advisor under the Nutrition and Dietetics Support Programme implemented by the National Department of Health and Voluntary Service Overseas.

Laura would like to thank her MSc supervisor, Dr. Marko Kerac, along with Dr. Laura Newberry at Queen Elizabeth Central Hospital (QECH), Malawi for their support in completing this project. Many thanks also to the staff of the paediatric nursery ward of QECH, who collected all the data for this audit through their daily work, and to her hard-working data entry assistant, A.T.



Location: *Malawi*

What we know: Severe acute malnutrition (SAM) in infants <6m is a significant global health burden. WHO 2013 guidance recommends community-based management for uncomplicated cases; in practice, management remains inpatient-based.

What this article adds: An audit (quantitative and qualitative data) was conducted of inpatient management of infants <6m admitted to the Queen Elizabeth Hospital in Malawi over a 23-month period. Substantial missing/compromised data were found: 15.9% had no admission weight, while 92% of weights and 81% of lengths were rounded figures. The prevalence of SAM and moderate acute malnutrition (MAM) were 12.1% and 9.9% respectively. SAM infants had 9.28 times higher odds of mortality ($p < 0.001$) than healthy-weight counterparts. Among malnourished infants, there was no significant difference in weight gain during admission, proportion of infants reaching normal nutrition status on discharge or mortality with the recruitment of an infant feeding specialist nurse (IFSN) or with baby-friendly hospital initiative (BFHI) training, during the audit period. The utilisation of supplementary suckling dropped over time. Use of infant formula increased (this related to supplies timing rather than interventions). Overall implementation of national SAM guidelines for infants <6m remained low, despite IFSN and BFHI; challenges included low staff knowledge of, and confidence in, guideline implementation. To address highlighted gaps, staff education and training, more research on anthropometric criteria for screening infants < 6m and a randomised controlled trial (RCT) on the impact of specialist feeding support are needed.

Background

Severe acute malnutrition (SAM) in infants less than six months (infants <6m) is a significant global health burden. Persisting misperceptions that infants cannot be malnourished, coupled with low staff confidence in identifying and managing malnutrition in this age group, means valuable opportunities to identify and treat nutrition problems are being missed (Kerac et al, 2012). As malnutrition in infancy has immediate and long-lasting effects, it is vital to improve the evidence base regarding the management of malnutrition in infants <6m.

In Malawi, it is estimated that 4.1% of infants <6m are severely wasted, compared with 2.6% of children aged 6-59 months (National

Statistical Office, 2010). Infants <6m have been included in Malawi's malnutrition guidelines since 2006; treatment is solely inpatient-based and centres around supplementary suckling for infants who can be breastfed (Malawi Ministry of Health, 2012). This technique uses a nasogastric tube attached to the nipple to deliver supplementary milk while the infant suckles at the breast. Stimulation of the nipple increases maternal breast milk supply and, as the process progresses, less supplementary milk is given via the tube as the infant receives more milk from the breast. Despite these long-standing national guidelines, limited resources – particularly of staff – have meant that they are rarely implemented due to the ample maternal counselling and support required to achieve success (Lelijveld et al, 2013).

In August 2013, funding was obtained to hire an infant feeding support nurse (IFSN) at Queen Elizabeth Central Hospital (QECH), Malawi's biggest public hospital, to implement the existing Malawi severe acute malnutrition (SAM) guidelines for infants <6m. Following her appointment, coincidentally baby-friendly hospital initiative (BFHI) training of all paediatric nursery ward (PNW) staff occurred one year later. Components of the BFHI, such as training staff in necessary skills to support mothers to establish or manage breastfeeding, are complementary to national SAM guidelines and therefore have the potential to reinforce the IFSN's efforts.

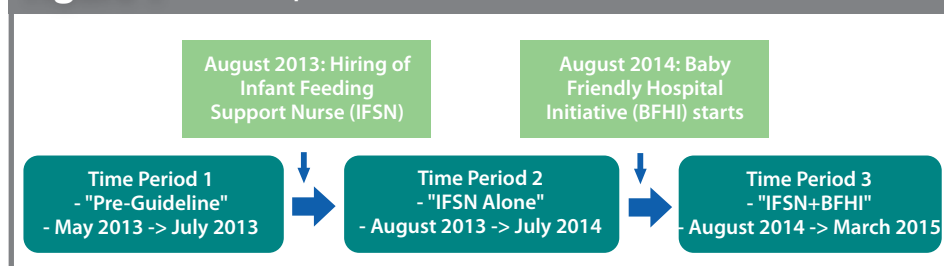
Audit outline

The aim of this audit was to review the impact of implementing existing Malawi SAM guidelines on the PNW at QECH as first implemented by the IFSN alone, and later supported by a wider group of BFHI-trained staff. The specific objectives of the audit were to:

Examine the management of malnourished infants by comparing treatment and discharge information to the national SAM guidelines for the different periods of implementation, specifically:

- the burden of malnutrition on the PNW (prevalence and links with mortality);
- the proportion of infants exclusively breastfed (EBF) at discharge;
- weight gain over the course of admission; and
- the proportion of infants reaching normal nutritional status at discharge.

The audit involved retrospective, quantitative (infant data) analysis supplemented with qualitative (staff perceptions) data to evaluate the impact of implementing SAM guidelines and BFHI on the ward, but was primarily descriptive in nature. The three time periods for data collection and analysis of the audit are detailed in Figure 1.

Figure 1 Audit time periods

Findings

Identification of malnourished infants

For this component of the audit, admission data recorded in the ward register was analysed to determine the burden of acute malnutrition on infants <6m admitted to the PNW at QECH. Results demonstrated that the collection of routine clinical data is currently a barrier to the identification of malnutrition on the PNW. Substantial missing data (15.9% of admissions had no weight) and heavy rounding of anthropometric measures (92% of weights and 81% of lengths) were discovered by the audit. Data from the ward register was analysed for all patients admitted during the time period and showed that 56.1% of the admissions were male; the median age at admission was eight weeks old; 23.4% of infants were HIV-exposed; and 86.5% of all admissions were exclusively breastfed on admission. As HIV status was recorded using two different sets of indicators (exposure and reactivity status), data were simplified to recording if an infant was exposed for analysis purposes (assumed all reactive infants were exposed).

Of the 3,651 infants admitted to the ward from May 9 2013 until March 31 2015, 2,405 (65.9%) infants had sufficient admission data recorded to be included in the prevalence of malnutrition calculations, using ENA for SMART software to calculate weight-for-length Z scores (WLZ). The overall prevalence of SAM (WLZ < -3) and MAM (-3 < WLZ < -2) respectively were 12.1% and 9.9%. Comparing WLZ calculated by ENA for SMART software to the WLZ information recorded in the ward register reveals that 30% fewer cases of SAM and 41.2% fewer cases of MAM were identified by staff in the ward register than could be calculated using ENA.

SAM infants had 9.28 times higher odds of mortality ($p < 0.001$) than their healthy-weight counterparts. The missed opportunities to identify SAM and MAM is therefore an important finding, as acutely malnourished infants have a higher risk of death on admission and interventions are available. Early detection of SAM infants and proper treatment following the Malawi SAM guidelines are likely to improve mortality outcomes of these vulnerable infants.

Management of acutely malnourished infants

Additional data were collected on malnourished infants ($n=179$) admitted to the ward focusing on the management of SAM treatment for these infants during admission. Across the whole audit, implementation of national SAM guidelines for

infants <6m remained low, although some variation was seen across the time periods. While the mean average weight gain (g/day) decreased from 60g/day pre-guideline (95% CI: -36, 158), to 15g/day with both the IFSN and BFHI (95% CI: 4, 27), the changes were non-significant ($p=0.353$). Pre-guideline, 22.2% of infants reached normal nutrition status at discharge, as opposed to 16.7% of those with IFSN+BFHI, although the small sample size used for these calculations impacts significance of these results ($p=0.806$). Mortality among SAM infants stayed constant across the three time periods ($p=0.125$), with an overall mortality rate of 17.9%.

To summarise, among malnourished infants, no significant difference in weight gain during admission, proportion of infants reaching normal nutrition status upon discharge or mortality was observed with the start of IFSN or BFHI. Although not collected formally, it was observed that the IFSN schedules regular check-up appointments when infants are discharged to track weight gain and any relapse, which is part of the national SAM guidelines for follow-up (the proportion of infants who return for these appointments is unknown as it is not collected as part of the audit).

The utilisation of supplementary suckling dropped over time (17.4% pre-guideline to 2.4% with IFSN+BFHI), $p=0.006$. This could possibly be attributed to the IFSN accurately identifying which infants needed this treatment, compared with the pre-guideline period when it was used with almost one-fifth of infants (despite a large number of infants during this time being misdiagnosed with SAM). The biggest difference observed was the number of infants discharged on infant formula ($p < 0.001$), reaching as high as 52.7% with the start of the IFSN. However, in staff discussions it was discovered this related to the supply of infant formula on the ward (shortages in supply occurred during pre-guideline and in IFSN+BFHI time periods) and cannot be causally linked with the staff interventions occurring at that time. It should be noted that at QECH nursery, infant formula is preferentially prescribed over F75 therapeutic milk for malnourished infants where EBF is not possible (orphans, cleft lip/palate, congenital heart disease, etc). The formula is not provided by the hospital, which is why supplies vary over time. On admission, it was determined that 71.5% of malnourished infants were exclusively breastfed with no significant differences in proportion of infants EBF across the time periods ($p=0.484$). On discharge, across the three time periods, 59.2% of infants were EBF with no significant

differences seen in the proportion of infants EBF over the time periods ($p=0.295$). It should be noted that although non-significant changes were seen over time, 65.2% of infants were EBF on admission pre-guideline, and 60.9% at discharge. For the IFSN+BFHI period, 66.7% were EBF on admission and 69.0% EBF at discharge.

Conclusions

Although no significant difference in progress and outcomes of infants <6m with the start of IFSN or IFSN+BFHI was found, the small sample size for each time period ($n=23$ pre-guideline, $n=114$ with IFSN, $n=42$ with IFSN+BFHI) and the use of operational data which varied in quality, limit interpretation of the audit findings and the ability to draw definitive conclusions on the impact of an IFSN. Contextual information collected through staff focus group sessions highlighted the challenges that exist in implementing national SAM guidelines, including supplies, staff knowledge of the guidelines, and confidence in implementing the guidelines. These focus group sessions also revealed that over the previous few months, the IFSN had been the only staff member calculating the WLZ for all admissions to the ward (identifying malnourished infants) and is the only staff member providing formal breastfeeding education. A future RCT that explores whether a dedicated IFSN improves outcomes is needed to provide a definitive answer.

Overall, this audit highlights the importance of addressing current gaps regarding identification and management of malnutrition for infants <6m. Staff education on the importance of robust, routine anthropometric measurements and the calculation of WLZ scores on admission to identify malnourished infants is the first priority to address these gaps and prevent deaths attributable to malnutrition in the short term. Secondly, contextual information suggests that training sessions on infant malnutrition and infant feeding would help staff feel more confident in dealing with malnourished infants. Longer term, more research is needed to expand the detection methods available for MAM/SAM screening in infants <6m (for example, MUAC or weight-for-age) and further explore the barriers regarding implementation of the Malawi SAM guidelines. Lastly, future RCTs are needed to examine more clearly the impact of an IFSN and the effectiveness of implementing SAM Guidelines on infant outcomes.

For more information, contact: Laura White, email: lvwhite@ualberta.ca

References

- Kerac M, Tehran I, Lelijveld N, Onyekpe I, Berkley J, Manary M, 2012. *Inpatient treatment of severe acute malnutrition in infants aged <6 months*. WHO.
- Lelijveld N, Mahebere-Chirambo C, Kerac M, 2013. *Carer and staff perspectives on supplementary suckling for treating infant malnutrition: Qualitative findings from Malawi*. *Maternal and Child Nutrition* 2013; pp593-603.
- Ministry of Health, 2012. *Malawi Severe Acute Malnutrition Guidelines*.
- National Statistical Office, 2010. *Malawi Demographic and Health Survey 2010*. Available from: dhsprogram.com/pubs/pdf/FR247/FR247.pdf

Relationship between MUAC and weight changes in children aged six to 59 months

Summary of research¹

Location: *Malawi, Ethiopia and Bangladesh*

What we know: MUAC is recognised as an independent admission/discharge criterion for SAM treatment; the relationship between weight and MUAC change needs further investigation.

What this article adds: A recent study explored the relationship between weight and MUAC changes in children under SAM treatment and the sensitivity of both indicators to disease episodes in Malawi (research conditions), Ethiopia and Bangladesh (both field conditions). Results show that MUAC and weight gain achieved over the entire treatment episode were strongly correlated in all three country contexts, irrespective of treatment outcome. Both appeared to respond rapidly (within one week or less) and similarly to episodes of illness reported during outpatient treatment. The results suggest that monitoring MUAC during treatment for SAM could provide a useful alternative to monitoring weight, particularly where weight measurement is not feasible.

Mid-upper arm circumference (MUAC) is routinely used in the outpatient treatment of severe acute malnutrition (SAM) as an independent admission and discharge criteria, as recommended by the World Health Organisation (WHO) (WHO, 2006). However, treatment protocols recommend weight gain as the primary method of monitoring the recovery of children during treatment for SAM. It has been suggested that MUAC is not suitable for monitoring recovery from SAM as increases in MUAC are thought to lag behind increases in weight. In December 2012, a consultation between United Nations, academic and non-governmental organisation (NGO) staff responsible for the design and management of therapeutic feeding programmes, organised by ENN, identified a lack of evidence regarding the relationship between weight gain and MUAC changes (ENN, 2013). This paper examines the relationship between weight gain and MUAC changes in children aged six to 59 months who were treated for SAM as outpatients in community-based management of acute malnutrition (CMAM) in order to add to the evidence base.

The objectives of this study were to describe:

- The relationship between weight changes and MUAC changes in children aged between six and 59 months during treatment for SAM in CMAM programmes; and
- The sensitivity of both MUAC and weight to episodes of disease experienced during the SAM treatment episodes in CMAM programmes.

The study was carried out in three country contexts: Malawi, Ethiopia and Bangladesh. In Malawi, data were collected on children aged six to 59 months with a MUAC \leq 115 mm enrolled in outpatient treatment for SAM, following Malawi National CMAM Guidelines, at Ministry of Health facilities. MUAC and weight were measured on admission and at each subsequent weekly visit

until they reached the discharge criteria of having a MUAC greater than 125 mm at two consecutive visits. Information on illness was recorded each week, based on seven-day recall from the carer attending with the child. These data were collected under research conditions by a single observer to minimise measurement errors. Prospective data were also obtained from CMAM programmes implemented by NGOs in two other country contexts: Ethiopia (Save the Children USA (SC-US)) and Bangladesh (Terre des hommes (Tdh)). Measurement and collection of the SC-US Ethiopia data were supervised by SC-US supervisors who were present at all clinic sessions. The SC-US Ethiopia data were entered from beneficiary record cards. Measurement and collection of the Tdh Bangladesh data were supervised by Tdh monitoring and evaluation staff, who visited clinics on a rotating basis with each clinic being visited on, at least, a quarterly basis. Clinic activities were monitored using a checklist of observations of key activities.

Data collected in Malawi were analysed for the correlation between MUAC and weight changes using the Pearson product-moment correlation coefficient (Pearson's r). Data from Ethiopia and Bangladesh were similarly analysed. The association of growth failure following recent episodes of illness were assessed for MUAC and weight change using a two-by-two table, box-plots and Kruskal-Wallis non-parametric rank sum test.

Results show that MUAC and weight gain achieved over the entire treatment episode were strongly correlated in all three country contexts; Ethiopia ($r = 0.816$, 95% CI [confidence interval] = 0.782 - 0.845), Malawi ($r = 0.843$, 95% CI = 0.802 - 0.876) and Bangladesh ($r = 0.725$, 95% CI = 0.663 - 0.777). MUAC and weight changes at each outpatient visit were closely correlated ($r = 0.954$, 95% CI = 0.602 - 0.997) under research conditions. The field data from Ethiopia and Bangladesh showed similar correlation ($r = 0.945$,

95% CI = 0.685 - 0.998) and ($r = 0.939$, 95% CI = 0.705 - 0.994) respectively. MUAC and weight appear to respond rapidly and similarly to episodes of illness reported during outpatient treatment for SAM. For MUAC, the relative risk (RR) for diarrhoea was 1.88 (95% CI = 1.64 - 2.15), vomiting RR = 1.89 (95% CI = 1.58 - 2.26), fever RR = 1.57 (95% CI = 1.36 - 1.82) and cough RR = 1.42 (95% CI = 1.22 - 1.65). Similar RRs are seen for weight; diarrhoea RR = 2.03 (95% CI = 1.77 - 2.31), vomiting RR = 2.09 (95% CI = 1.77 - 2.47), fever RR = 1.76 (95% CI = 1.53 - 2.03) and cough RR = 1.25 (95% CI = 1.06 - 1.48).

The relationship between weight changes and MUAC changes in children aged six to 59 months at each follow-up visit during outpatient treatment for SAM shows a strong correlation in all contexts, irrespective of the treatment outcome. This correlation was observed whether the data were collected under research or operational field conditions. Both MUAC and weight respond negatively to episodes of illness, with comparable magnitudes of change for each illness. The response for both is similarly rapid (i.e. within a period of one week or less), with no obvious lag, irrespective of the type of illness reported. With the acceptance of MUAC as both an admission and discharge criterion, the results of this study suggest that MUAC could also be used for monitoring the recovery of the child. While the response to treatment for SAM would normally be monitored using weight, the results of this study imply that a very similar recovery trajectory would be observed if MUAC were used for monitoring instead.

The authors conclude that changes in weight and MUAC observed during treatment for SAM in outpatient therapeutic programmes are closely correlated in data from three different country contexts under research and field operational conditions. Changes in weight and MUAC resulting from episodes of diarrhoea, vomiting, fever and cough respond similarly and rapidly without any lag effect on the part of MUAC. The results suggests that monitoring of MUAC during treatment for SAM could provide a useful alternative to monitoring weight. Admission, monitoring recovery and discharge from treatment using MUAC alone provides a potential opportunity to further decentralise the treatment of SAM to areas where weighing equipment may be unavailable or access to health facilities is limited, potentially improving programme coverage and effectiveness. Further research is required in order to develop and test appropriate MUAC monitoring tools and safe corresponding care protocols for field testing in various contexts.

¹ Binns P, Dale N, Hoq M, Banda C, & Myatt M, 2015. Relationship between mid-upper arm circumference and weight changes in children aged 6-59 months. Archives of Public Health (2015) 73:54 DOI 10.1186/s13690-015-0103-y

References

- ENN, 2013. *A consultation of operational agencies and academic specialists on MUAC and WHZ as indicators of SAM*. Field Exchange 45, May 2013. Available at: www.enonline.net/fex/45/consultation.
- WHO, 2006. WHO, UNICEF, and SCN *Informal Consultation on Community-Based Management of Severe Malnutrition in Children*. (2006). Available at: www.who.int/nutrition/publications/severemalnutrition/FNB_0379-5721.pdf

Integrated protocol for severe and moderate acute malnutrition in Sierra Leone

Summary of research¹



Attending children at an integrated treatment programme

Amanda Maust, Malawi, 2013

Location: *Sierra Leone*

What we know: Implementing separate protocols for MAM and SAM treatment can be administratively cumbersome in emergency settings.

What this article adds: A cluster-randomised controlled trial in Sierra Leone explored whether integrated MAM and SAM treatment improves recovery rate and community coverage. A total of 1,957 children under five years of age were enrolled and randomly assigned to integrated treatment (decreasing RUTF dose for SAM, LNS for MAM, limited duration of treatment, no routine medication, peer counselling) or standard treatment (government protocol, RUTF for SAM, CSB for MAM, micronutrient supplementation and prophylactic antibiotics). Different anthropometric enrolment criteria and definitions of recovery were used by the study arms that limit direct comparison of SAM/MAM outcomes. Most of the children receiving integrated treatment were MAM cases (70%), were younger, had higher WHZ on enrolment and less oedema. For standard treatment, 63% were SAM. Coverage was 71% for integrated and 55% for standard care ($P=0.0005$). GAM recovery was 83% for integrated and 79% for standard treatments. Care group participation was associated with a greater recovery rate. Loss to follow-up at six months after recovery was high for both arms (45%), which limited further planned analyses. The findings suggest that integrated care may be an acceptable alternative to standard care in emergencies; care should be exercised in extrapolating the findings to other contexts.

Global acute malnutrition (GAM) is the sum of moderate acute malnutrition (MAM) and severe acute malnutrition (SAM). It is common in developing countries and is found in approximately 8% of children worldwide. Management of malnutrition is often assisted by the UN agencies; however there is division of labour and responsibility for the two forms of acute malnutrition (WFP for MAM and UNICEF for SAM), which means that use of different foods and separation of treatment protocols for MAM and SAM treatment can be administratively cumbersome in emergency settings. This paper describes a clinical trial in post-conflict Sierra Leone before the advent of the Ebola outbreak of 2014 to test the hypothesis that integrated MAM and SAM treatment would result in an overall higher recovery rate and provide higher community coverage than the standard separate MAM and SAM treatment programmes.

Method

This study was a cluster-randomised controlled trial in Sierra Leone conducted in ten centres treating GAM in children aged 6–59 months. Children were randomised for up to 12 weeks treatment in an integrated (five centres) or standard programme (five centres). Catchment areas

for both programmes were similar. A sample size of 900 children was planned for each study arm. The integrated protocol used the presence of bipedal oedema and/or mid upper arm circumference (MUAC) <12.5 cm to identify SAM, and MUAC alone for MAM. The standard protocol used MUAC, oedema and WHZ criteria (see Table 1 for details). For both approaches, where appetite was inadequate, the child was admitted for inpatient treatment.

The integrated protocol included a decreasing ration of ready-to-use therapeutic food (RUTF). Children returned for follow-up every 14 days. An RUTF ration sufficient for two weeks was dispensed if the child had not recovered. When a child with SAM gained sufficient MUAC to be classified as MAM, the ration of RUTF was reduced. After a child had received six rations of RUTF over 12 weeks but had not recovered, he or she was deemed as having remained malnourished, no further RUTF was given and they were referred for medical evaluation. This definition of remaining malnourished was chosen because in previous work, $>95\%$ of children reached their outcome by week 12, and no further improvement was seen between weeks 12 and 16 of feeding. Children who recovered received no more RUTF, but instead were given

500g of a lipid nutrient supplement (LNS) that provided 100% of the RDA for all micronutrients and 200 kcal/d when taken as 40 g/d. All caretakers were referred to a clinic-based care group (mother peer-counselling group) that focused on a variety of child nutrition and health issues, including improving breastfeeding practices.

The standard therapy protocol (as per government guidelines) treated MAM children with a fortified blended flour, treated SAM children with RUTF (according to the national protocol in Sierra Leone) and used weight-for-height Z score (WHZ) criteria to determine admission and discharge to the treatment programme. Follow-up occurred weekly until the child had a WHZ of more than -2 for two consecutive visits. There was no limit to duration of treatment. No peer counselling was provided. Table 1 summarises the components of the integrated and standard protocols for the management of GAM.

The primary outcomes were coverage and recovery rates (recovery rates were not directly comparable because recovery was defined differently in the two study groups). Coverage was defined as the fraction of children receiving treatment for malnutrition among all those who were eligible. This was determined by a coverage survey conducted in each of the ten centre catchment areas using the Simplified LQAS (Lot Quality Assurance Sampling) Evaluation of Access and Coverage (SLEAC) sampling design.

Data analyses

Data were double-entered in Microsoft Access. Anthropometric indexes were based on the WHO 2006 Child Growth Standards, calculated by using Anthro version 3.22 (WHO) and AnthroPlus version 1.0.4 (WHO). Comparisons of enrolment characteristics between study groups were made by using Fishers exact test for categorical variables and Students test for continuous variables. P values <0.05 were considered to be significant.

A direct comparison of recovery rates was not possible because recovery was defined differently in the two study groups, so a CI was cal-

¹ Maust A, Koroma AS, Abba, C., Molokwu N, Ryan KN, Singh L & Manary MJ. (2015). Severe and moderate acute malnutrition can be successfully managed with an integrated protocol in Sierra Leone. *Journal of Nutrition* 30 September 2015. doi: 10.3945/jn.115214957

culated by using a one-sample Z test to convey a sense of how often the schemes succeeded with the children they enrolled. Comparisons of weight gain, MUAC gain, number of clinical visits and final WHZ between both programmes were made by creating linear regression models. Coefficients with P values <0.05 were considered to be significant.

Results

A total of 1,957 children were enrolled in the study. The study arms had disparate baseline characteristics, partly due to the different enrolment and recovery rate definitions used by the study arms, so direct comparisons of outcomes are difficult. The children who received integrated management were younger than those receiving the standard management, with a higher WHZ upon enrolment, were less likely to be oedematous and more likely to report a fever. Most of the children receiving integrated management had MAM (774 of 1,100; 70%); whereas among those receiving standard management, SAM predominated (537 of 857; 63%; P = 0.0001).

Coverage was 71% in the communities served by integrated management and 55% in the communities served by standard care (P = 0.0005). GAM recovery in the integrated management protocol was 910 of 1,100 (83%) children and 682 of 857 (79%) children in the standard therapy protocol.

Children who received integrated management recovered more quickly with greater MUAC gain and a higher WHZ on completion. Children

who received standard management had greater rates of weight gain. The loss to follow-up at six months was high (55% return rate for both treatments).

The cost of RUTF used to treat a SAM case in integrated management was US\$36, whereas for the standard management of SAM it was US\$68 (this difference relates to the reducing dose and limited period of RUTF use (12 weeks) in the integrated programme). The cost of supplementary food used to treat a case of MAM in either the integrated or the standard management scheme was US\$12.

Discussion

To allow for some comparisons, linear regression modelling was used to examine the 95% confidence intervals of the proportions measured in each group separately for recovery. The authors speculate that the larger proportion of MAM cases (and hence shorter recovery time) in the integrated management system was due to the caregivers actively seeking treatment earlier on in their child's process of malnutrition; perhaps because they believed the care would be more readily available in this delivery system.

The authors observe that care group participation was associated with a greater recovery rate, suggesting that reinforcing good nutrition and hygiene practices may be a useful adjunct to feeding programmes among children with GAM. The differences in weight gain seen between the two groups are attributable to the more severe wasting seen in the standard therapy

group (and hence will have greater rates of weight gain when treated). The greater coverage rates seen in the integrated management group may be due to the more consistent nature of the clinical service and no stock-outs. Better understanding by the mothers that their child would be assessed and treated for both MAM and SAM by attending the integrated clinic may also have contributed to the higher coverage rate in this group.

The high rate of loss to follow up (at six months) prevented analysis of the effectiveness of the LNS and simple infection control measures that were given in the integrated management group. Comparisons of cost-effectiveness of the two management schemes could not be made because many of the costs of care were not documented; reduced food cost and simpler logistical requirements of the integrated model are likely to make it less costly to implement, per child treated.

The paper concludes by suggesting that an integrated management scheme for GAM may be simpler to implement in humanitarian crises. The use of a single food product simplifies logistics, the exclusion of additional micronutrients makes delivery of care easier and the exclusive use of MUAC as an anthropometric index may be easier for local health aids to master. This study showed that integrated management of GAM in children is an acceptable alternative to standard management, with similar recovery rates and greater community coverage. The authors advise that care should be exercised in extrapolating the findings to other contexts.

Table 1 Comparison of integrated and standard management of MAM and SAM²

	Standard management		Integrated management	
	MAM	SAM	MAM	SAM
Programme name	SFP	OTP	Integrated programme	Integrated programme
Admission criteria (children aged 6–59 mo)	MUAC ≥ 11.5 and <12.5 cm or WHZ ≥ -3 and <-2	Odema or MUAC <11.5 cm or WHZ <-3	MUAC ≥ 11.5 and <12.5 cm	Odema or MUAC <11.5 cm
Therapy/food given	Super cereal plus (CSB, oil, sugar), 1250 kcal/d	RUTF, 200 kcal/(kg · d)	RUTF, 75 kcal/(kg · d)	RUTF, 175 kcal/(kg · d)
Breastfeeding intervention	Messaging on-site	Messaging on-site	Care groups on-site and home visits	Care groups on-site and home visits
Cured discharge criteria	≥ -2 WHZ for 2 wk	MUAC ≥ 11.5 or WHZ ≥ -3, without odema	MUAC ≥ 12.5 cm	MUAC ≥ 12.5 cm without odema
Medical interventions	Vitamin A	Vitamin A, folic acid, oral amoxicillin, antimalarial (at admission)	Lipid nutrient supplement	Lipid nutrient supplement
	Albendazole	Albendazole (week 2), measles vaccination (week 4)	Oral rehydration solution	Oral rehydration solution
	Iron/folate	HIV-infected children receive co-trimoxizole	Malaria prophylaxis	Malaria prophylaxis
	Measles vaccination (at admission)		Program of immunisations that includes the entire complement recommended by WHO (at discharge)	Program of immunisations that includes the entire complement recommended by WHO (at discharge)

² CSB, corn-soy blended flour; MAM, moderate acute malnutrition; MUAC, mid upper arm circumference; OTP, outpatient; RUTF, ready-to-use therapeutic food; SAM, severe acute malnutrition; SFP, supplementary feeding programme; WHZ, weight-for-height z score.

New Lancet Series on breastfeeding

Substantial development in research on breastfeeding over the past three decades has been captured in a recent Lancet series on breastfeeding. Two papers in this series, summarised in this issue of *Field Exchange*, describe past and current global trends in breastfeeding, its short and long-term health consequences for the mother and child considering different contexts, the impact of investment in breastfeeding, the determinants of breastfeeding, and the effectiveness of promotion interventions. An editorial and two comments (one on the economics and one on infant formula marketing) also feature; highlights as follows.

Keith Hansen argues that breastfeeding makes for excellent economics and describes the various strategies the World Bank is undertaking regarding this, relating to both intervention delivery and policy environment (such as labour laws and maternity leave) (Hansen, 2016). McFadden

et al spotlight the consequences of inappropriate promotion and marketing of infant formula with reference to the International Code for Marketing of Breastmilk Substitutes. It draws on six country case studies conducted by Save the Children which showed inadequate implementation and enforcement of the Code, despite the enactment of its provisions into law. A 2014 WHO report found that less than a quarter of 199 countries have a functioning Code implementation and monitoring system in place with evidence of violations, such as company influence of health professionals by offering incentives. An example of the strong coordination necessary comes from the Philippines post-typhoon. The authors consider that the omission of breastfeeding from the Millennium Development Goals was a lost opportunity that should not be repeated for the Sustainable Development Goals. Existing initiatives such as the Global Breastfeeding Advocacy Initiative and the Network

for Global Monitoring and Support for Implementation of the International Code (NetCode) can help provide the strong leadership needed.

The Lancet editorial makes the point that, while the series is comprehensive and the most in-depth analysis to date, the message is not new. Despite the evidence, global progress on breastfeeding rates has stalled. The reasons women avoid or stop breastfeeding range from the medical, cultural and psychological to physical discomfort and inconvenience. There are consequences for child and maternal health. The editorial concludes that genuine and urgent commitment is needed from governments and health authorities to establish a new normal: where every woman can expect to breastfeed, and to receive every support she needs to do so.

Full articles and related content are available at: www.thelancet.com/series/breastfeeding

References

Hansen K, 2016. *Breastfeeding: a smart investment in people and in economies*. *The Lancet Breastfeeding Series Vol 387*, Issue 10017, Jan 30 2016, p416.

McFadden A, Mason F, Baker J, Begin F, Dykes F, Grummer-Strawn L, Kenney-Muir N, Whitford H, Zehner E, Renfrew MJ, 2016. *Spotlight on infant formula: coordinated global action needed*. *The Lancet Breastfeeding Series Vol 387*, Issue 10017, Jan 30 2016, pp413-415.

Why invest and what it will take to improve breastfeeding practices?

Summary of research¹

Location: *Global*

What we know: Global breastfeeding rates remain far below international targets, commitment to breastfeeding in terms of policy and investment has waned.

What this article adds: A systematic review and meta-analysis was conducted to review determinants of breastfeeding and the effectiveness of interventions. Supportive measures are needed involving health systems and services, family and community, and workplace and employment. Best outcomes are achieved through adequate delivery of relevant interventions delivered concurrently through several channels. Women's work is a leading motive for not breastfeeding or early weaning; the majority of women with little or no maternity protection (80%) live in Africa and Asia. Global infant formula sales in 2014 were worth US\$44.8 billion; most of projected (50%) growth is in the Middle East, Africa and Asia-Pacific regions. Economic losses of not breastfeeding are estimated at \$302 billion annually or 0.49% of world gross national income. Increased and continued exclusive breastfeeding translate into significantly reduced treatment costs of childhood disorders. The patterns, drivers and consequences of suboptimal breastfeeding, and the interventions needed, will vary by setting. Reliable estimates of the costs and benefits of the actions needed to support optimal breastfeeding, including maternity entitlements, are difficult to calculate; urgent research is needed. Six actions are proposed, related to advocacy, societal attitudes, political will, breastmilk substitute industry regulation, scale up of interventions, and removal of structural and societal barriers. Political support and financial investment are needed.

Global breastfeeding rates remain far below international targets and commitment to breastfeeding in terms of policy and investment is in a state of fatigue. Despite its established benefits, breastfeeding is no longer a norm in many communities. Paper 2 of the Lancet series on breastfeeding summarises a systematic review of available studies and revises previous conceptual frameworks to identify the determinants of breastfeeding. Case studies on three pairs of countries (Bangladesh/Nigeria, Brazil/China, USA/UK) that are similar in economic development but differ in breastfeeding trends were constructed to explore why breastfeeding prevalence has increased, stagnated, or declined with time. It also describes a systematic review and meta-analysis of interventions aimed at promoting, protecting and supporting breastfeeding.

Multifactorial determinants of breastfeeding need supportive measures at many levels, from legal and policy

¹ Why invest, and what it will take to improve breastfeeding practices? (2016) Rollins, N. C., Bhandari, N., Hajeerhoy, N., Horton, S., Lutter, C. K., Martines, J. C., Piwoz, E. G., Richter, L. M., Victora, C. G. The Lancet Breastfeeding Series Group (2016)

directives to social attitudes and values, women's work and employment conditions, and healthcare services to enable women to breastfeed. The authors examined the effects of interventions according to the three settings identified in the conceptual model (Figure 1): health systems and services, family and community, and workplace and employment. The meta-analyses showed that when relevant interventions are delivered adequately, breastfeeding practices are responsive and can improve rapidly. The best outcomes are achieved when interventions are implemented concurrently through several channels, e.g. combined health systems and community interventions can increase exclusive breastfeeding by 2.5 times

Women's work is a leading motive for not breastfeeding or early weaning. Although nearly all countries have maternity protection legislation, only 98 (53%) of 185 countries meet the International Labour Organization's 14-week minimal standard and only 42 (23%) meet or exceed the recommendation of 18 weeks' leave; in addition, there are 32 large informal work sectors for which protection does not extend to. Consequently, hundreds of millions of working women have no or inadequate maternity protection, the overwhelming majority (80%) of whom live in Africa and Asia. Maternity leave and workplace interventions are beneficial, although studies are few and are generally limited to high income settings. Most studies reviewed explored the effects of direct interventions, rather than the role of policies and enabling interventions, such as maternity and workplace policies or health insurance for lactation support.

It is well understood that the marketing of breastmilk substitutes (BMS) negatively affects breastfeeding. The International Code of Marketing of Breastmilk Substitutes (1981) and subsequent World Health Assembly resolutions (the Code) represent the collective will of the member states of the United Nations (UN) to protect, promote and support breastfeeding, and so carries substantial political and moral weight. However, its effectiveness depends on national legislation, monitoring and enforcement. Using market research, the authors describe the growing retail value of the baby milk formula industry; global sales in 2014 were US\$44.8 billion, illus-

trating the industry's large, competitive claim on infant feeding. Sales are projected to increase by more than 50% by 2019, with most of this growth in the Middle East, Africa and Asia-Pacific regions.

Using economic modelling techniques, the authors describe the effects of not breastfeeding being associated with lower intelligence and estimate economic losses of about \$302 billion annually or 0.49% of world gross national income (GNI). Losses in low and middle income countries account for \$70.9 billion (0.39% of GNI). The paper goes on to describe reduced treatment costs of five common infectious diseases for four countries (UK, USA², Brazil and China) if exclusive breastfeeding and continued breastfeeding (up to 1 or 2 years depending on country and disorder) were to increase. A 10% point increase in exclusive breastfeeding up to 6 months or continued breastfeeding up to 1 year or 2 years (depending on country and disorder) would translate into reduced treatment costs of childhood disorders of at least \$312 million in the USA, \$7.8 million in the UK, \$30 million in urban China, and \$1.8 million in Brazil. The environmental costs of BMS (energy to manufacture, materials for packaging, fuel for transport distribution and water fuel and cleaning agents for daily preparation and use) are also considered though not monetised, e.g. more than 4000 L of water are estimated to be needed along the production pathway to produce just 1 kg of BMS powder.

The review could not ascertain national or overseas aid budgets for the protection or support of breastfeeding; limited data suggests an overall decrease.

Discussion

The health and economic costs of suboptimal breastfeeding are largely unrecognised; the authors argue that investments to promote breastfeeding, in both rich and poor settings, need to be measured against the cost of not doing so. The world is still not a supportive and enabling environment for most women who want to breastfeed; achieving this is a collective societal responsibility.

Too few women are appropriately supported through adequate maternity and workplace en-

titlements to be able to work or attend school and still breastfeed; either they are not provided or the women are working in the informal economy. The patterns and drivers of suboptimal breastfeeding vary by setting. Therefore, the mixture of interventions and investments needed to implement them, including the cost of maternity entitlement, are likely to differ greatly between settings. Without more robust data, reliable estimates of the costs and benefits of the actions needed to support optimal breastfeeding are difficult to calculate. One study estimated that it will cost \$17.5 billion globally for a large set of interventions, much of this figure driven by the recurring costs of maternity entitlements for poor women. Research into the costs of breastfeeding-enabling policies and programmes relative to their full range of benefits, including maternity entitlements, is urgently needed.

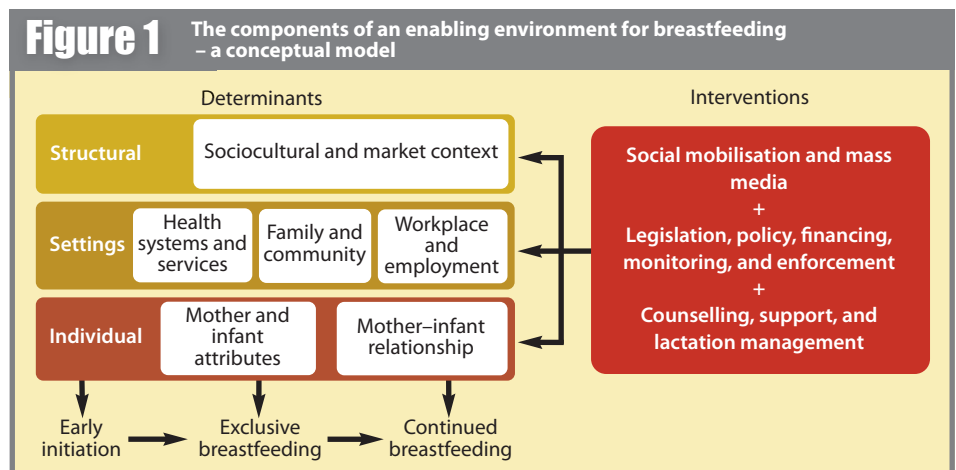
In low-income and middle-income countries, the improvement of breastfeeding impacts on preventable infant and child deaths. In both high-income and low-income countries, improvements in breastfeeding will improve human capital and help to prevent non-communicable diseases in women and children. Low-income and middle-income countries are at a crossroads of deciding whether to act to avoid the downward trends in breastfeeding practices that have been noted in high-income countries in the past century.

This review of the evidence and country case studies show that successful protection, promotion and support of breastfeeding need measures at many levels to realise the potential gains from increasing rates of exclusive and continued breastfeeding. The authors propose six action points for policy makers and programme managers to approach this challenge:

- i) disseminate the evidence of the value of breastfeeding as a powerful intervention for health and development that benefits children and women alike
- ii) foster positive societal attitudes towards breastfeeding
- iii) show greater political will to protect, promote and support breastfeeding
- iv) regulate the BMS industry through more vigorous enforcement of the Code (which will require political commitment and greater investment to ensure implementation and accountability)
- v) scale up and monitor breastfeeding interventions and trends in breastfeeding practices
- vi) political institutions should exercise their authority and remove structural and societal barriers that hinder women's ability to breastfeed.

The authors conclude that without commitment and active investment by governments, donors and civil society, the promotion, protection and support for breastfeeding will remain inadequate and the outcome will be major losses and costs that will be borne by generations to come.

² For USA, asthma, leukaemia, type 1 diabetes, and childhood obesity were also included in the analyses.



Breastfeeding in the 21st century

Epidemiology, mechanisms, and lifelong effect

Summary of research¹

Location: *Global*

What we know: The decision not to breastfeed a child impacts on the health, nutrition and development of a child and on women's health.

What this article adds: A systematic review and meta-analyses investigated breastfeeding patterns and associated outcomes in 129 low and middle-income countries (LMICs) and 36 high-income countries (HICS). Exclusive breastfeeding rate was low (37% in LMICs and 20% in HICS). Prevalence of most infant and young child feeding (IYCF) indicators decreased with increasing national wealth. Poorer people breastfeed for longer in LMICs; the converse is true in HICS. Where infectious diseases are a common cause of death, breastfeeding provides major protection against death, especially in infants under six months (12% of risk in sub-analysis); diarrhoea (reduces by 50%); and respiratory infection (one-third reduction). In HICS, significant protection is provided against sudden infant death syndrome (36% reduction) and necrotising enterocolitis (premature infants) (58%). Breastfeeding is also associated with 68% reduction in malocclusions and in high-income settings, protection against otitis media in children under two. Near-universal scale-up of breastfeeding could prevent 823,000 annual deaths (13.8%) in under twos in high-mortality LMICs. Maternal benefits include significant protection against breast cancer (4.3% incidence reduction per 12 months of breastfeeding) and ovarian cancer (16% reduction). A further 22,216 lives per year (in addition to 19,464 deaths currently averted) would be saved by increasing breastfeeding duration. Progress on breastfeeding is critical to achieving six of the SDG goals and to reach the WHA 2030 50% exclusive breastfeeding target.

The importance of breastfeeding in low and middle-income countries (LMICs) is well recognised, but less consensus exists regarding high-income countries (HICS). Twenty-eight systematic reviews and meta-analyses (22 specially commissioned) were used to investigate breastfeeding patterns and associated outcomes as part of the Lancet breastfeeding series (Paper 1).

Breastfeeding indicators and data source

The review involved systematic searches of published literature and, where possible, meta-analyses for outcomes postulated to be associated with breastfeeding. Standard WHO infant and young child feeding (IYCF) indicators were used from LMICs, with reanalysis of national survey data such as Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS). Systematic reviews of published data, grey literature and public health contacts were used in HICS. National data on breastfeeding in the latter was lacking; thus, additional indicators (ever breastfed, breastfeeding at six months, breastfeeding at 12 months) were calculated to allow for global comparisons. Complete information was sourced from approximately 127 of 139 LMICs. For HICS, data were obtained for 37 out of 75 countries; for several countries, only

a subset of the breastfeeding indicators were available (results should therefore be interpreted with caution). In all analyses, country data was weighted by populations of children under two years of age.

The relative risks for protection against all infectious disease causes of death in children under two years of age and against the 15% of deaths caused by prematurity complications were applied. The Lives Saved Tool was used to predict number of deaths of children under five which would be prevented if breastfeeding patterns of 2013 were scaled up to the 75 countries that are part of the Countdown to 2015 effort, and to estimate impact of global breastfeeding patterns on breast cancer and ovarian cancer rates.

Limitations

Findings are limited by the observational nature of most of the available data for breastfeeding, the limitations of meta-analyses, the scarcity of experimental data, and confounding factors (the reviews included sub-analyses of studies with tight control for confounders). Wherever possible, separate analyses for LMICs was done. Interpretation of associations is affected by the fact that non-breastfed infants receive different diets in different countries; e.g. association between breastfeeding and overweight is likely affected by the diet of non-breastfed infants. Most HICS

are unable to report on standardised, reliable indicators, contrasting with the consistent DHS/MICS data available from LMICs.

Results

Globally, the prevalence of breastfeeding at 12 months is highest in sub-Saharan Africa, south Asia and parts of Latin America (>80% in low-income and lower-middle income countries). In most HICS, the prevalence is lower than 20%. In LMICs, only 37% of infants <6m are exclusively breastfed (data are not available for HICS); in children aged 6-23 months, 37% were not breastfed. Most mothers in all country groups started breastfeeding (only France, Spain and USA had rates below 80% for ever breastfed).

A strong inverse correlation ($p < 0.0001$) between breastfeeding at six months and log gross domestic product (GDP) per person was seen; for each doubling in the GDP per head, breastfeeding prevalence at 12 months decreased by 10 percentage points. Except for early initiation, prevalence of all indicators decreased with increasing national wealth.

¹ Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect (2016). Victora, C. G., Bahl, R., Barros, J. D. A., França, G.V.A., Horton, S., Krasevec, J., Murch, S. Sankar, M. J., Walker, N., Rollins, N. C. The Lancet Breastfeeding Series Group (2016).

Poorer mothers tend to breastfeed for longer than their richer counterparts in all country groupings but especially in middle-income countries; the converse is true in HICS. Trend analysis in LMICs suggests modest gains in exclusive breastfeeding since 2013 have largely taken place amongst the richest 20% of families.

Mortality and infectious disease

Most data came from LMICs. In three studies that examined breastfeeding in infants <6m and mortality, exclusively breastfed infants had 12% of the risk of death compared to non-breastfed. In another three studies, infants < 6m had 3.5 times (boys) and 4.1 times (girls) increase in mortality. In studies in children aged 6-23m, any breastfeeding was associated with a 50% reduction in deaths.

In HICS, meta-analyses of six high-quality studies showed ever breastfeeding was associated with a 36% (CI 19-49) reduction in sudden infant deaths. Another meta-analysis (four randomised controlled trials) showed a 58% decrease in necrotising enterocolitis (a risk for premature infants with high fatality).

In terms of child morbidity, data largely from LMICs shows that about half of all diarrhoea episodes (72% of hospital admissions for diarrhoea) and a third of respiratory infections (57% of admissions) would be avoided by breastfeeding. Breastfeeding was also associated with 68% reduction in mal-occlusions. In high-income settings, important protection was identified from otitis media in children under two years of age.

The authors did not find significant associations with asthma (5% reduction based on subset of tightly controlled trials), allergic disorders, or blood pressure or cholesterol, although an increase in tooth decay with longer breastfeeding over 12 months of age (likely due to inadequate oral hygiene) was noted.

Non-communicable diseases

Most studies came from high-income settings. Based on 113 studies, longer periods of breastfeeding were associated with a 26% reduction (95% CI 22-30) in the odds of overweight or obesity, an effect consistent across income classifications. Based on a sub-set of 23 high quality studies, a pooled reduction of 13% (95% CI 6-19) in the prevalence of overweight or obesity was found. Restricting meta-analyses to three high-quality studies indicated a reduction of 24% (95% CI 60% reduction to 47% increase) in type 2 diabetes. Breastfeeding was consistently associated with higher performance in intelligence tests in children and adolescents. Pooled estimate for a sub-set of nine studies that adjusted for maternal intelligence with other confounding factors showed a pooled effect of 2.6 points (1.3-4.0).

Effects on the mother

The review confirms that increased breastfeeding, especially exclusive and predominant, were associated with longer periods of amenorrhoea (improving birth spacing). There is a robust inverse association between breastfeeding and breast cancer; the largest individual level analysis (50,000 patients from 47 studies) found each 12-month increase in lifetime breastfeeding was associated with a reduction of 4.3% (95% CI 2.9-6.8) in the incidence of invasive breast cancer. The reduction, comparing longer versus shorter durations of breastfeeding based on a restricted sub-analysis of studies that controlled for parity, was 7%. Similarly, an analysis of a sub-set of

The authors also estimate that existing global rates of breastfeeding avert 19,464 annual breast cancer deaths. Over half of deaths averted (58%) are in low-income regions with long breastfeeding durations (Africa and south Asia), although these regions accounted for just 35% of the global population included in the analysis. It is estimated a further 22,216 lives per year would be saved by increasing breastfeeding duration from present levels to 12 months per child in HICS and two years per child in LMICs. Latin America, central and eastern Europe, the Commonwealth of Independent States and HICS would benefit most (higher incidence of breast cancer and shorter durations of breastfeeding).

Conclusions

The findings reflect that the decision not to breastfeed a child has major, long-term effects on the health, nutrition and development of the child and on maternal health; it is likely that no other health behaviour (which is effectively a personalised medicine) can affect such varied outcomes in the two individuals involved. Where infectious diseases are a common cause of death, breastfeeding provides major protection. In HICS, significant mortality protection is provided against sudden infant death syndrome and necrotising enterocolitis. Maternal benefits include significant protection against breast cancer and ovarian cancer. Associated longer-term child benefits are increased intelligence, lower overweight/obesity, and lower type 2 diabetes.

More than 80% of newborns receive breastmilk in nearly all countries, but early initiation rate (within one hour of birth) is low. In most countries, exclusive breastfeeding rates are well below 50% (the WHA 2025 minimum target); the current rate of increase (0.5% per year in LMICs since 2013) would need to be doubled to achieve this. There is no WHA target for continued breastfeeding.

In LMICs, time-trend analysis suggests that rich mothers are adopting exclusive breastfeeding at a much faster rate than poor mothers. Protecting breastfeeding in the poorest populations is the priority. In the poorest countries, late initiation and low rates of exclusive breastfeeding are the main challenges; in middle and high-income countries, short overall duration of breastfeeding is an additional one. The paper calls for the need to tailor breastfeeding support strategies to specific patterns recorded in each country.

The authors conclude that the findings reflect how essential the protection, promotion and support of breastfeeding is for the achievement of Sustainable Development Goals 1,2,3,4,8 and 10 by 2030.



Exclusive breastfeeding is a critical but elusive practice. Here, eighteen year old refugee, Kowsar Ahmed Hussein, gives one month old Jamal water to drink at a WFP transit camp in Bossaso, Puntland, Somalia.

WFP/Karel Prinsloo - Somalia, 2015

studies that controlled for parity found a reduction of 18% in ovarian cancer associated with longer periods of breastfeeding. Clear associations between breastfeeding and reduced maternal depression were seen, but it is more likely that depression affects breastfeeding than the opposite.

Estimating lives saved

Using the Lives Saved Tool, the authors estimate that the scaling-up of breastfeeding to a near-universal level could prevent 823,000 annual deaths (13.8%) in children under two years of age (in 75 high mortality LMICs). The majority (87%) of preventable deaths would have occurred in infants under six months.

Grandmothers from Korogocho listen to the moderator as she takes them through the costing process of the outcome of interest

APHRC, Kenya

Social Return on Investment (SROI) assessment of a Baby-Friendly Community Initiative in urban poor settings, Nairobi, Kenya

By Sophie Goudet, Caroline W. Wainaina, Teresia N. Macharia, Milka N. Wanjohi, Frederick M. Wekesah, Peter Muriuki, Betty Samburu, Paula L. Griffiths and Elizabeth W. Kimani-Murage

This research was supported by the research consortium Transform Nutrition, funded by the UK Department for International Development, but the views expressed in this report do not necessarily reflect the UK Government's official policies. The original intervention study was funded by the Wellcome Trust, UK. We are grateful to the Unit of Nutrition and Dietetics and the Unit of Community Health Services at the Ministry of Health, Kenya; the sub-County Health Management Teams in Makadara and Kasarani; and the Nairobi County Council. The authors would also like to thank UNICEF, Concern Worldwide, the Urban Nutrition Working Group and the Nutrition Information Working Group convened by the Unit of Nutrition and Dietetics, among other agencies, NGOs and organised groups for their guidance and support in the design and implementation of the intervention. The team thank Tim Goodspeed of Social Value UK for mentorship on SROI assessment. The team is also indebted to the study community, the community health volunteers involved and the data collection and management teams.

This article presents the social impact of the Maternal, Infant and Young Child Nutrition (MIYCN) project; a pilot project from the African Population and Health Research Centre (APHRC) that aimed to improve the health and nutrition of mothers and children and inform implementation of the Government's Baby-Friendly Community Initiative (BFICI). The findings presented here used a Social Return on Investment (SROI) analysis, an accepted method of measuring the social impact of programmes in a participatory way that uses financial proxies to measure the value of changes that stakeholders experience (positively and negatively). As SROI is a relatively new evaluation method in nutrition interventions, this paper largely focuses on the tools and methodology used.

Background

APHRC, in collaboration with the Unit of Nutrition and Dietetics and the Unit of Community Health Services at the Ministry of Health in Kenya, implemented a research project consisting of home-based nutritional counselling of mothers by Community Health Volunteers (CHVs) known as the Maternal, Infant and Young Child Nutrition (MIYCN) project (<http://bit.ly/1HARcJB>). The MIYCN intervention was a randomised controlled trial, testing the Baby-Friendly Community Initiative (BFICI) in urban slums in Kenya (Kimani-Murage et al, 2013). A total of 1,100 pregnant women and their respective children were recruited into the study and followed up. The mother-child pairs were followed up until the child was up to one year old. The mothers received regular, personalised, home-based counselling by trained CHVs on MIYCN. Regular assessment of MIYCN knowledge, attitudes and practices was conducted, together with assessments of nutritional status of the mother-child pairs and diarrhea morbidity among the children. The project was conducted in Korogocho and Viwandani slums of Nairobi from 2012 to 2015 and was funded by the Wellcome Trust.

Location: Kenya

What we know: The social impact of nutrition interventions is not well evidenced.

What this article adds: The social impact of the Maternal, Infant and Young Child Nutrition (MIYCN) project in Kenya was investigated using a Social Return on Investment (SROI) analysis method. Data collection used a mixed-methods approach; 281 stakeholders participated. Value games were used to place value on outcomes which did not have a market value. Chain of events described how one outcome led to another. The MIYCN intervention showed overall an important positive impact. The results confirmed the expected results (e.g. having healthier children, mother being healthier), identified other positive outcomes that were not expected (e.g. mothers received more support from fathers) and identified some negative outcomes (e.g. stress transitioning from exclusive breastfeeding). The outcomes with most social value to mothers and children stakeholders were 'healthier mother' and 'less worried mother due to better health'. The team will investigate the design of a less time and budget-intensive SROI for nutrition interventions.

Methodology

Stakeholders form the basis of an SROI as organisations or people who were impacted directly or indirectly by the project; they report on the outcomes and value them. Here, the included stakeholders were the mothers recruited in the study, their children, siblings of the children, fathers of the children, grandmothers, healthcare providers, the data collection team and daycare centres operational in the intervention area.

Data collection used a mixed-methods approach (focus group discussions (FGDs), key informant interviews (KIIs), in-depth interviews (IDIs), quantitative stakeholder surveys, and revealed preference using value games). The qualitative approach explored the impact of the intervention per stakeholder using data from 19 FGDs, 27 KIIs and 20 IDIs with a total of 161 participants. The quantitative stakeholder survey assessed the level of impact (frequency of people reporting an outcome), explored costs, duration and comparison with outcome if the project had not taken place. Data were collected on 281 participants (separate questionnaire for mothers, CHVs, grandmothers, daycare centres, business community, healthcare providers and data collection team). Value games were used to place value on outcomes which did not have a market value (e.g. confidence). These were conducted using additional 16 FGDs (mothers, fathers, grandmothers, CHVs, and data collection team) and six KIIs (daycare centres and therapeutic feeding centres). Findings were crosschecked and triangulated using other sources of data (randomised controlled trial and cost-effectiveness analysis using qualitative data).

The chain of events described how one outcome led to another to end up with the identified outcome. For example, the outcome 'mothers were less worried' was at the end of the following chain of events: "The counselling on household hygiene to mothers resulted in improved knowledge about

hygiene practices and better household hygiene practices. Babies were reported to have less diarrhoea and increased weight gain. This resulted in fewer hospital visits and reduced expenditure on health-care. Mothers were less worried". These chains of events were detailed for each outcome using participant citation, which provided deeper understanding of how the intervention impacted people's lives. Financial proxies were identified to value the impact of the outcome with or without market value. For outcomes such as 'increased cost of healthcare and nutritious food', we asked stakeholders in the quantitative questionnaire and used the average cost. For outcomes such as 'mothers were less worried' or 'data collection team members were more confident', we used willingness to pay via value-games exercises (see Box 1 for an example of a value game with grandmothers; see also following link to a value-game video: <http://socialvalueofnutrition.org/2016/03/16/social-returns-on-investment-value-game/>).

We estimated a number of stakeholders who reported the outcome based on frequency in stakeholder questionnaire with inference to the general population. The duration of the outcome was estimated based on stakeholders' responses in the questionnaire. In the analysis, skills and health-related outcomes that can have 'life-lasting' impact were limited to five years, as they were complicated to evaluate beyond this period. Assumptions were made to take into account whether other organisations or people contributed to the impact (attribution); if the intervention displaced activities (displacement); what would have happened anyway (deadweight); and what the decline over time would be (drop off). Assumptions were also made to recognise how future financial values are worth now using discount rate.

Results

In the SROI process, outcomes were identified as perceived by the stakeholders and their values using financial proxies. The results confirmed the expected results (e.g. having healthier children, mother being healthier), identified other outcomes that were not expected (e.g. mothers received more support from fathers) and some outcomes identified were negative (e.g. increased level of worry for mothers due to challenges in introducing complementary feeding after exclusive breastfeeding for six months). In total, 34 outcomes were identified, with 11 negative ones and 20 positive but not expected (see Tables 1 and 2).

The analysis estimated that, after accounting for discounting factors, the input (\$USD419,716) generated \$USD8 million of social value at the end of the project (for more on the findings see SROI Short Report (aphrc.org/publications/social-return-investment-assessment-baby-friendly-community-intervention-urban-poor-settings/) and the BFCI Policy Brief (aphrc.org/publications/measuring-value-baby-friendly-community-intervention-nairobi-slums/)).

The net present value created by the project was estimated at \$USD29.5 million. The SROI analysis showed that the MIYCN programme was assessed highly effective and created social value: US\$1

invested in the project was estimated to bring US\$71 of social value for the stakeholders.

Limitations

The limitations were related to the complexity of assessing future health benefits and the challenges in valuing non-market-valued outcomes. We decided therefore not to value future health benefits and to limit the duration of impact to five years. We feel that this may underestimate future health benefits, but without data on how to evaluate these we preferred not to include them. We used willingness to pay via value games to monetise outcomes without market value such as confidence, burden of care, worry, happiness, etc. While value-game exercises were done to minimise subjectivity and to reach a consensus per stakeholder group, sensitivity analysis showed that the SROI ratio was mostly sensitive to these.

Discussion and conclusion

The MIYCN intervention showed overall an important positive impact. The intervention resulted in better mother and child health and increased confidence of mothers to exclusively breastfeed and better nutritional outcomes, among other things. Unexpected benefits were identified that could only be accounted for and quantified using the SROI approach. The impact was less important for grandmothers, fathers and CHVs. Nevertheless,

Box 1 Valuing social outcomes: value game example with grandmothers

The value game was used to determine the monetary value of outcomes without market values. In the case presented below, the grandmothers were willing to pay USD6,000 to be happy and USD9,000 to have a lesser burden of care.

Steps in SROI value game

1. The grandmothers individually list at least three to four material items they can buy/have bought for them that can last at least a year.
2. The list is compiled and the grandmothers list the items in order of priority from what would make them happiest to least happy.
3. The grandmothers then place the outcome of interest in the ranked outcomes, again in order of priority.
4. The material items are then ranked according to their worth in monetary value for one year, from the most to the least expensive.
5. The outcomes of interest are then placed back in their original positions and valued.
6. Finally, the grandmothers were asked if they agreed with the value of the outcome of interest.

Table 1 Outcomes identified per stakeholder group

Stakeholder Group	Outcomes
Mothers	Outcome 1.1: Increased expenditure on nutritious food and/or healthcare; Outcome 1.2: More worried mother due to loss in baby weight and poor health; Outcome 1.3: Less worried mother due to better health of her children; Outcome 1.4: Decreased expenditure on food and/or healthcare; Outcome 1.5: Confident mother to take children to health check-ups; Outcome 1.6: Having less burden of care; Outcome 1.7: Improved relationship at home; Outcome 1.8: Less stressed mother; Outcome 1.9: Less income due to job loss; Outcome 1.10: Healthier mother; Outcome 1.11: Receiving more support from father.
Children	Outcome 2.1: Healthier baby; Outcome 2.2: Less healthy baby; Outcome 2.3: Better cognitive development.
-	Outcome 3.1: Improved school performance for siblings; Outcome 3.2: Healthier sibling.
Fathers	Outcome 4.1: Increased support to mother and child; Outcome 4.2: Increased labour participation; Outcome 4.3: Improved living standards at home.
Grandmothers	Outcome 5.1: Reduced stress; Outcome 5.2: Happier grandmother; Outcome 5.3: Decreased healthcare expenditure.
Healthcare providers	Outcome 6.1: Decrease in workload; Outcome 6.2: Increased workload.
Community health volunteers	Outcome 7.1: Financial strain; Outcome 7.2: Increased stress; Outcome 7.3: Increased confidence.
Data collectors	Outcome 8.1: Increased income; Outcome 8.2: Increased confidence; Outcome 8.3: Increased stress; Outcome 8.4: Financial strain.
Daycare centres	Outcome 9.1: Increased stress; Outcome 9.2: Increase in expenditure; Outcome 9.3: Increased attendance of children.

Red is negative, black is positive unintended and green is positive intended.

these stakeholders also reported positive outcomes such as increased happiness and improved living standards at home. Key negative outcomes were also identified; for example, women foregoing work in order to breastfeed their children optimally, since their workplaces were not supportive. Overall, the intervention had a negative impact on daycare centres and healthcare providers, putting too much pressure on them without providing extra support. Daycare managers reported having to invest more but with the same income, as mothers were not willing to pay for improvements in the daycare centres. Community health volunteers also underwent psychosocial and financial stress emanating from the level of poverty in the communities in which they were working. Future interventions should consider such potential negative outcomes and find measures to mitigate them, which may include finding social protection measures for vulnerable populations.

A comparison of the MIYCN SROI ratios against other SROI studies showed the ratio obtained was the highest so far, but this is also the only study that assessed nutrition-promotion (Banke et al, 2015). The outcomes that generated the most social value to mothers and children stakeholders were 'healthier mother' and 'less worried mother due to better health'. The negative outcomes that will need to be tackled in future programming are: 'less healthy baby due to difficulty in introducing complementary feeding after six months'; '[stress transitioning from] exclusive breastfeeding' for children and 'increased workload for healthcare workers due to mothers seeking child check-ups'. These findings led to a policy brief and recommendations (see Box 2).

SROI, as an evaluation tool, is very powerful but can be costlier and more time-consuming than other evaluation methods, such as cost-effectiveness analysis. The team will investigate the design of a lighter SROI for nutrition interventions that can respect the SROI principles while meeting time and budget constraints.

For more information, contact: Sophie Goudet, email: S.Goudet@lboro.ac.uk or Elizabeth Kimani-Murage, email: ekimani@aphrc.org

More details on the findings and plans are available at the socialvalueofnutrition website: www.socialvalueofnutrition.org/.

Box 2 Policy recommendations

1. National and county governments and donors
 - Fund BFCI as a priority health-promotion tool. BFCI has many far-reaching positive impacts on the health and wellbeing of both family and community members, including, mothers, fathers, children and grandmothers.
 - Support the community health strategy by providing incentives for community health volunteers and adequately training CHVs on handling psychosocial issues.
 - Empower the community economically through social protection measures such as job-creation and support of mothers who wish to successfully combine work with breastfeeding.
 - Include fathers in BFCI interventions as they are a key determinant to its success.
2. Researchers, NGOs and donors
 - Adopt SROI approach in evaluation of interventions in order to manage unexpected outcomes and value social outcomes.
 - Build the capacity of program implementers to include SROI in their evaluations.

For policy brief and recommendations, see: <http://bit.ly/1R238n8>.

References

Banke-Thomas AO, Madaj B, Charles A, & van den Broek N, 2015. *Social Return on Investment (SROI) methodology to account for value for money of public health interventions: a systematic review*. *BMC Public Health*, 15, 582. doi.org/10.1186/s12889-015-1935-7

Kimani-Murage EW, Kyobutungi C, Ezeh AC, Wekesah F, Wanjohi M, Muriuki P, Musoke RN, Norris SA, Griffiths P, & Madise NJ, 2013. *Effectiveness of personalised, home-based nutritional counselling on infant feeding practices, morbidity and nutritional outcomes among infants in Nairobi slums: study protocol for a cluster randomised controlled trial*. *Trials* 14.1: 445. doi: 10.1186/1745-6215-14-445.

Table 2 A selection of participant comments regarding outcomes

Outcome	Participant comments
Mothers	
Improved infant feeding practices and hygiene	"Mine is doing well, I didn't know about clinic and breastfeeding the baby till six months, because I have another one whom I started giving milk at two weeks. So it has helped me because this one has not been as sickly as the other one." (FGD, Mothers, Nairobi slums.)
Healthier mothers	"I was worried because I felt... first of all we were being told that she didn't have enough blood in the body and we were told that she should eat certain fruits and there are some small beans that she was told to eat so that she can have blood in the body... the change that occurred, mostly she was healthy... By the way it is good because when she (CHV) was there she (mother) became healthy." (FGD, Fathers, Nairobi slums.)
Fathers	
Increased involvement in child care	"It was excellent because not many people feel that the father should also take care of the baby, people just think it's the mother..." "I was taught... and I was told to at least be participating also..." (IDI, Father, Nairobi slums.)
Increased involvement in family planning	"You know my child and the other one follow each other so closely so when we were told about family planning... I decided 'let me leave them to grow' so I don't have stress of children... right now I have some years before I get another child as I look for a job." (FGD Fathers.)
Children (from their mothers)	
Better developmental milestones	"Yes, I have seen changes because that child, even people ask me 'why is your child growing so fast?' because right now s/he is a half a year and s/he is walking and I told them it is the mother who used to teach me (CHV)." (FGD, Mothers, Nairobi slums.)
Less burden of care • More responsible young mothers	"It has helped me too because if it was not for the teachings, I would not be going to my work, I would be there because I am taking care of that child, she doesn't know how to wash her child but she was taught what to do... So it has helped me." (FGD, Grandmothers, Nairobi slums.)
Mothers, health workers and CHVs	
Increased healthcare staff due to increased referrals	"Actually, right now we have a nutritionist, we never used to have, the nurse was doing everything but due to increased referrals they (NGO) posted a nutritionist here, after seeing our data, they saw that there was a need in Korogocho, somebody needs to support for the figures to stop increasing." (KII, Nurse, Nairobi slums.)
Negative outcomes	
Loss of livelihood	"Some mothers had to make critical changes stopping to work so that they can optimally breastfeed their children. So based on what we were taught by the CHV, his father refused, so we decided that the baby breastfeeds for six months and then he starts eating and then he continues to breastfeed until two years and put my job aside." (FGD, Mothers, Nairobi slums.)
Increased expenditure on food	"[Due to buying more nutritious food] "Ever since I delivered, the economy has to really go up because the baby needs food, you have to prepare its food separately. Previously you never used to cook separately for the baby, but now if the baby wants bananas you buy for it, you buy for it whatever it wants. So if you cook for the baby plus what you will eat, the cost becomes high. It must just go up." (FGD, Mothers, Nairobi slums.)
Stress and difficulties in transitioning from EBF	"Up to six months the baby was fine but when I started giving him/her food, the baby reduced in weight and started being sickly." (FGD, Mothers, Nairobi slums.)
Increased psychosocial and financial stress for CHVs	"You go to counsel a mother and she tells you: 'I even did not eat, I slept hungry, so I used to be forced to call (another team leader) because at times I did not have money... So we were forced to contribute and give her. Maybe the mother has three days since delivery, you cannot tell her to go and work. So you will have to support her... So it was a big change that I did not expect.'" (FGD, CHVs, Nairobi slums.)

Community weighting of barriers and boosters in Democratic Republic of Congo

By Lenka Blanárová, Sophie Woodhead and Mark Myatt



Lenka Blanárová is a Community Mobilisation Advisor at ACF-UK, supporting nutrition programmes in Burkina Faso, Chad, Democratic Republic of Congo and

Pakistan in the implementation of coverage assessments and the development of evidence-based community engagement strategies to boost their uptake and coverage.



Based within the ACF-UK Operations Team, Sophie Woodhead coordinates all activities and research projects

under the Coverage Monitoring Network. She has supported a number of coverage trainings in west, east and central Africa as well as in Asia.



Mark Myatt is a consultant epidemiologist. His areas of expertise include surveillance of communicable diseases,

epidemiology of communicable diseases, nutritional epidemiology, spatial epidemiology and survey design. He is currently based in the UK.

Location: *Democratic Republic of the Congo*

What we know: Perceptions of the relative importance of boosters and barriers to Community Management of Acute Malnutrition (CMAM) services access and coverage may differ between assessment teams and the community.

What this article adds: A recent case study examines the feasibility of involving community members in the weighting of barriers and boosters found using barriers-boosters-questions (BBQ) analyses in a SQUEAC assessment of programme coverage. Flash cards were used to present barriers and boosters to community members, followed by a ranking exercise and a weighting exercise (personal ballot of selected representatives and collective ranking). Weights were summarised for each barrier and booster using the median vote. Weightings given to barriers and boosters by the SQUEAC team and by community members did not always coincide; differences may not greatly affect the position of the prior mode but may, for example, influence programme reform. The method has potential but requires further development.

Previous experience has shown that the Semi-Quantitative Evaluation of Access and Coverage (SQUEAC) assessment team's perceptions of the relative importance of individual factors with a positive impact (boosters) and negative impact (barriers) on access and coverage may differ from the community's assessment of the same factors. The input of community members is, therefore, potentially useful when weighting barriers and boosters for use in SQUEAC stage III assessments and for their translation into meaningful rec-

ommendations for programme reform. This case study examines the feasibility of involving community members in the weighting of barriers and boosters found using barriers-boosters-questions (BBQ) analyses in a SQUEAC assessment of programme coverage in Kirotshé health district, North Kivu Province, Democratic Republic of the Congo (DRC).

Methods and results

Following SQUEAC stage I qualitative data collection involving the daily organisation of barriers,

boosters and questions using the BBQ tool, a small team of experienced SQUEAC assessment team members set out to test the feasibility of using community members to weight barriers and boosters. The work reported here took place in a single, purposively selected, exemplar community. The exemplar community was deemed to be broadly representative of the entire health district and chosen to be neither too close nor too far from the centre of the health district.

In preparation for the exercise, a set of large (i.e. A4 size) flashcards each depicting a single

Figure 1 Example of a flash card used to present barriers and boosters

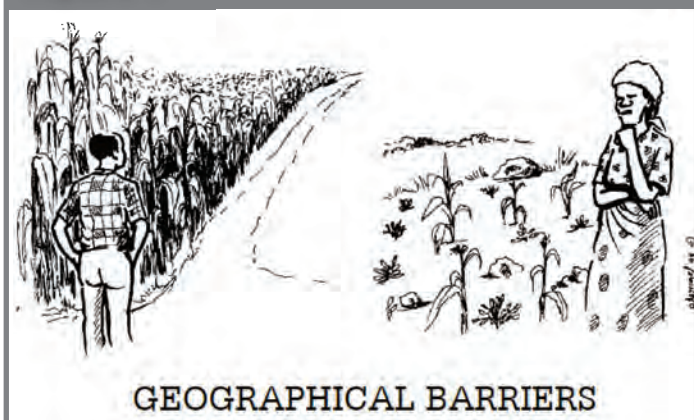


Figure 2 Example of a flash card used to present barriers and boosters

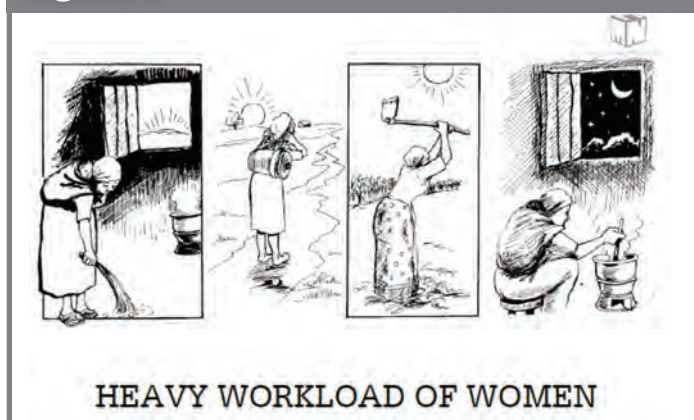
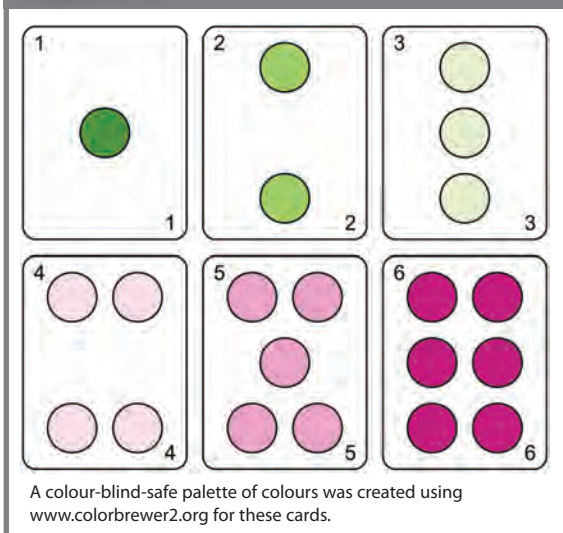


Figure 3 Example voting (weighting) cards



barrier or booster were prepared. Flashcards were put together electronically using copyright-free images available online. Figure 1 and Figure 2 show examples of flashcards for two barriers.

Multiple sets of voting cards displaying weights 1, 2, 3, 4, 5 and 6 were also prepared. These were designed and printed using different colours for each weight in order to facilitate the weighting process for participants with weak basic numeracy skills (see Figure 3).

The selected exemplar community was informed about the purpose and organisation of the exercise in advance and participation agreed. A group of five men and five women took part in the exercise. Only three persons of each sex voted.

Following an introduction, during which participants were encouraged to speak for the whole health district rather than focus on the needs of their own family or community, the team presented the identified barriers and boosters one by one using the set of flash cards and adding relevant descriptive and narrative detail gathered during stage I of the SQUEAC investigation.

After each barrier and booster had been presented and explained, the relevant flash card was placed on the ground for all participants to see and ask questions (see Figure 4). When all uncertainties were clarified, participants were asked to discuss and rank barriers in order of importance, starting with those likely to have had the biggest impact on coverage and access to treatment. This exercise was repeated for boosters. Table 1 presents results of the ranking exercise for both barriers and boosters.

Upon completion of the ranking exercise, the team explained the weighting exercise.

Three men and three women were selected and each received a complete set of voting cards (see Figure 3). The planned weights ranged between one (lowest impact on coverage) and six (highest impact on coverage). Given the large number of barriers and boosters identified during stage I of the SQUEAC investigation, it was decided that participants needed to vote on a scale ranged between one and seven. A weight of seven was achieved using two voting cards (e.g. a weight of seven was formed from 6 + 1 or 5 + 2 or 4 + 3).

When ready, participants were asked to turn their backs

Figure 4 Exchange with participants on barriers and boosters. Flash cards are laid on the ground so that participants can refer to them if required



Table 1 Ranked lists of barriers and boosters (community rankings)

Barriers (negative factors)		Barriers (negative factors)	
1	Lack of awareness about malnutrition	1	Information sharing at the community level
2	Geographical barriers	2	Good adherence to treatment
3	Heavy workload of women	3	Appreciation of CMAM service
4	Problems related to gender	4	Good quality CMAM service
5	Insufficient community sensitisation	5	Good collaboration among partners
6	Traditional beliefs and practices	6	Knowledge about malnutrition
7	Treatment-seeking behaviours	7	Efficiency of CHW networks
8	Shortcomings in CHW networks	8	Good quality quantitative data
9	Refusal of referral to inpatient care		
10	Stigmatisation		
11	Poor quality of CMAM service		
12	Occasional RUTF stock-outs		
13	Lack of awareness about CMAM programme		

Table 2 Results of the weighting exercise for barriers and boosters

Barrier	Community weights (sorted)	Median weight
Lack of awareness about malnutrition	1, 3, 4, 5, 5, 5	4.5
Geographical barriers	2, 3, 4, 4, 7, 7	4.0
Heavy workload of women	2, 3, 7, 7, 7, 7	7.0
Problems related to gender	5, 5, 6, 6, 7, 7	6.0
Insufficient community sensitisation	7, 7, 7, 7, 7, 7	7.0
Traditional beliefs and practices	3, 5, 5, 6, 6, 7	5.5
Treatment-seeking behaviours	3, 5, 5, 6, 6, 5	5.0
Shortcomings in CHW networks	1, 1, 2, 2, 4, 7	2.0
Refusal of referral to inpatient care	1, 1, 3, 3, 5, 5	3.0
Stigmatisation	2, 2, 2, 4, 4, 7	3.0
Poor quality of CMAM service	1, 3, 4, 5, 6, 7	4.5
Occasional RUTF stock-outs	1, 2, 3, 4, 4, 6	3.5
Lack of awareness about CMAM programme	2, 3, 5, 6, 6, 6	5.5
	SUM	60.5
Booster	Community weights (sorted)	Median weight
Information sharing at the community level	2, 6, 7, 7, 7, 7	7.0
Good adherence to treatment	3, 3, 6, 6, 6, 7	6.0
Appreciation of CMAM service	3, 4, 4, 5, 7, 7	4.5
Good quality CMAM service	4, 5, 5, 5, 7, 7	5.0
Good collaboration among partners	1, 6, 7, 7, 7, 7	7.0
Knowledge about malnutrition	2, 2, 3, 5, 6, 6	4.0
Efficiency of CHW networks	2, 7, 7, 7, 7, 7	7.0
Good quality quantitative data	1, 1, 4, 5, 6, 7	4.5
	SUM	45.0

Figure 5 Participants raising voting cards displaying a number of points reflecting the importance of a particular barrier or booster in coverage or access to treatment



on the other participants in order to limit the influence on their voting. Women tended to shuffle voting cards under their garments to prevent others from peeking.

The team reviewed each barrier separately and participants voted by raising voting cards displaying a number of points reflecting the perceived importance of a particular barrier on coverage or access to treatment (see Figure 5). This process was repeated for boosters.

Weights were summarised for each barrier and booster using the median vote. If, for example, the votes for a specific barrier were:

3,5,1,5,5,4

these were sorted:

1,3,4,5,5,5 $\frac{4+5}{2} = 4.5$

and the middle value taken. The average of the middle two votes was taken:

median vote

in the case of an even number of votes.

Table 2 shows the results of the weighting exercise for barriers and boosters. The weighting of barriers and boosters did not always coincide with their collective ranking or with the rankings of the SQUEAC team (see Table 3). The discrepancies between the collective ranks and the ranks from voting show that ‘consensus’ approaches may yield different results from ‘private ballot’ approaches and this can form the basis for further discussions with the group.

Results (i.e. Table 2 and Table 3) were presented to the group. Group members were invited to voice additional opinions and suggest recommendations for the improvement of the provided Community based Management of Acute Malnutrition (CMAM) services.

The ‘private ballot’ results were combined with other results from other sources and methods (i.e. using a simple average) to decide an appropriate prior mode for uses in the SQUEAC stage III survey (see Table 4).

Conclusions

The work presented in this case study demonstrates that it is feasible to use members of the community to weight barriers and boosters and provide input into the development of the prior for the SQUEAC stage III surveys. Such a prior would follow the SQUEAC principles of triangulation by source and method.

Table 3 Ranks for barriers and boosters from two methods

Barrier	Rank from...		
	Group discussions ¹	Individual votes ²	SQUEAC team ^{2,3}
Lack of awareness about malnutrition	1	5	2
Geographical barriers	2	6	2
Heavy workload of women	3	1	3
Problems related to gender	4	2	2
Insufficient community sensitisation	5	1	1
Traditional beliefs and practices	6	3	2
Treatment seeking behaviours	7	4	2
Shortcomings in CHW networks	8	9	1
Refusal of referral to inpatient care	9	8	4
Stigmatisation	10	8	1
Poor quality of CMAM service	11	5	3
Occasional RUTF stock-outs	12	7	4
Lack of awareness about CMAM programme	13	3	3

Booster	Rank from...		
	Group discussions ¹	Individual votes ²	SQUEAC team ^{2,3}
Information sharing at the community level	1	1	3
Good adherence to treatment	2	2	3
Appreciation of CMAM service	3	4	1
Good quality CMAM service	4	3	3
Good collaboration among partners	5	1	3
Knowledge about malnutrition	6	5	2
Efficiency of CHW networks	7	1	3
Good quality quantitative data	8	4	3

¹ Ranking without ties.

² Ranks from weighting exercises (ties allowed).

³ The ranks given to barriers and boosters by the SQUEAC team in a separate exercise undertaken before the community weighting exercise described in this case study.

Table 4 Prior modes from different methods and sources

Method	Source	Barriers score	Boosters score	Calculation for prior mode	Prior mode
Simple BBQ	SQUEAC team	17	10	$\frac{10 \times 5 + (100 - 17 \times 5)}{2}$	32.5%
Weighted BBQ	SQUEAC team	60	43	$\frac{43 + (100 - 60)}{2}$	41.5%
Concept map ¹	SQUEAC team	65	27	$\frac{27 + (100 - 65)}{2}$	31.0%
Histogram of belief	SQUEAC team	NA	NA	Mode of histogram	31.0%
Weighted BBQ ²	Community members	60.5	45	$\frac{45 + (100 - 60.5)}{2}$	42.3%
AVERAGE					35.7%

¹ Counts of negative and positive links in the SQUEAC summary concept map (see Figure 6).

² Scores used are the sums of the median weights (see Table 2).

Figure 6 Counting positive and negative links in a concept map



The finding that weightings given to barriers and boosters by the SQUEAC team and by community members did not always coincide suggests that the approach has value. Such differences may not greatly affect the position of the prior mode used in the SQUEAC stage III survey. In the work reported here, the position of the prior mode from the SQUEAC team alone (i.e. mean of the four methods used) was 34.0% and the position of the prior mode with community weighting added was 35.7%. The differences may, however, be useful to inform the priority given to different programme reforms. For example, the discrepancy between the SQUEAC team's weightings and the community weightings with regard to the efficiency of the Community Health Worker (CHW) network found in the work reported here suggests that more data should be collected to inform reforms of the CHW network.

It is important to note that the work presented in this case study is not intended as a complete model of what should be done in SQUEAC assessments. If the community-weighting method is to be applied, it may prove useful to increase the range of sources used for community-based weighting to include, for example, all ethnic and religious groups, communities near to and distant from programme sites, community health workers/community-based volunteers, clinical and other programme staff and carers of children attending the program. The use of a diverse set of sources would follow the SQUEAC principle of triangulation by source.

Combining results from different sources and methods could follow a hierarchical method in which the prior modes from related sources are averaged and then the prior modes from all sources are averaged. This process is outlined graphically in Figure 7. In the hypothetical example here, the prior mode is 40.1%. The width of the prior mode could be calculated as:

$$prior\ mode \pm range\ of\ prior\ modes_{All\ sources} \\ = 40.1\% \pm (48.3\% - 31.0\%) = 40.1\% \pm 17.3\%$$

Figure 8 shows a suitable prior for the example shown in Figure 7 created with the BayesSQUEAC calculator. Care should be exercised not to specify an overly strong prior. It is probably not a good idea to specify a range narrower than $\pm 15\%$.

The work presented here shows promise. The method does, however, require further development before it can be recommended for use as a standard component of SQUEAC assessments.

Programme implementers and SQUEAC practitioners are encouraged to use community-feedback mechanisms (such as those described in this case study) in order to improve service delivery. These may be integrated into SQUEAC assessments or done as separate programme activities. Experiments, developments and findings could be submitted to Field Exchange for publication or presented and discussed on the en-net coverage assessment forum: www.en-net.org/forum/16.aspx.

For more information, contact: Sophie Woodhead, email: S.Woodhead@actiongainsthung.org.uk

Figure 7 A prior mode found using triangulation by source and method

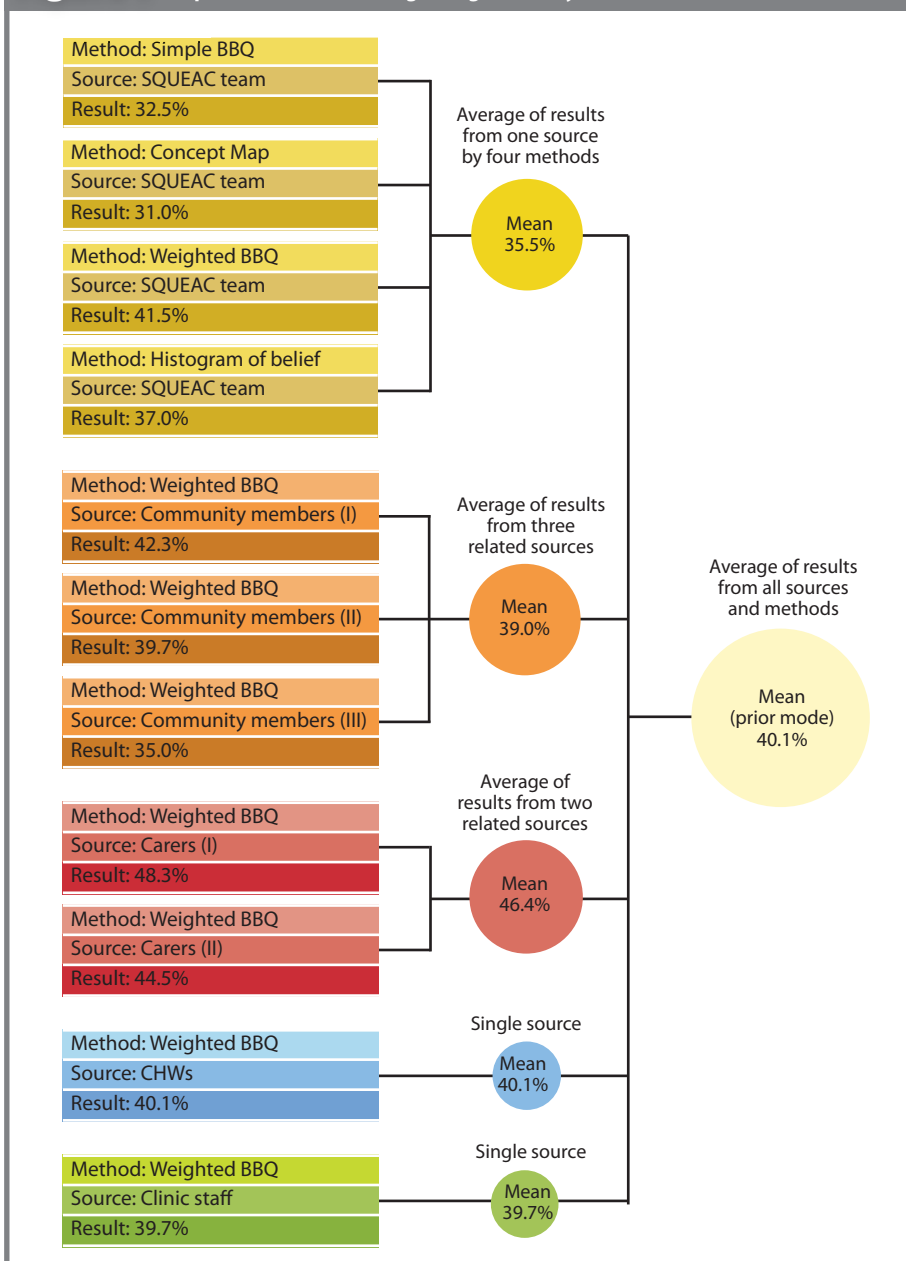
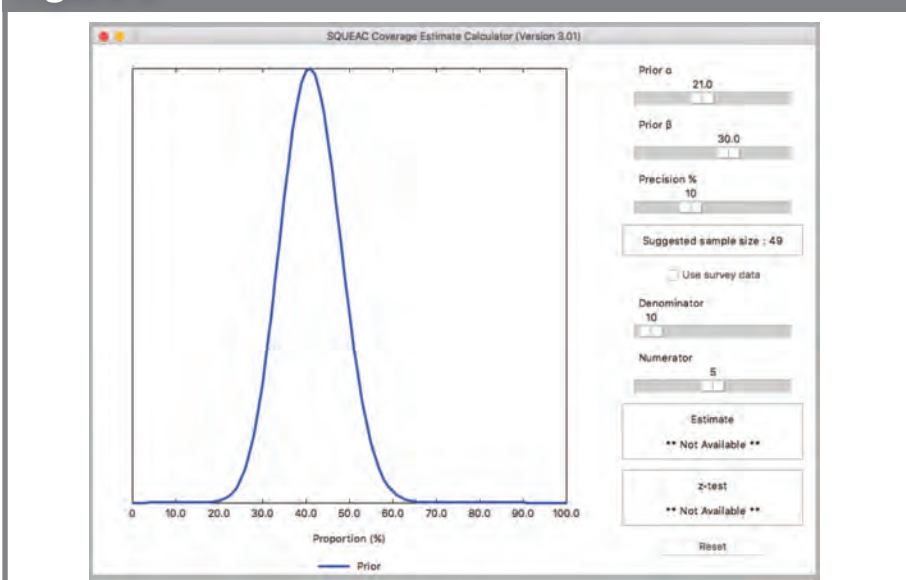


Figure 8 A suitable prior for the example in Figure 7 created using the BayesSQUEAC calculator



Note: Care should be exercised not to specify an overly strong prior.

Putting kwashiorkor on the map

Summary of research¹

Location: *Global*

What we know: The global burden of kwashiorkor, or oedematous malnutrition, is overlooked in scientific and public health fora. There are challenges in prevalence estimation.

What this article adds: An updated mapping (meta-analysis of shared data) of global kwashiorkor caseload and prevalence was conducted by the CMAM Forum/UNICEF/ACF/WHO. Kwashiorkor constitutes more than a third of SAM cases (MUAC <115mm) or oedema in equatorial Africa. There is a high variation of kwashiorkor globally; many oedematous cases are not classed as SAM using MUAC/WHZ; oedema cases often have low WHZ. Associated mortality also varies widely but is highest among children who have MUAC <115mm and oedema (marasmic kwashiorkor). High rates of oedema were reported in Central and Southern Africa, as well as Haiti. Oedema prevalence was greatest in the youngest age groups (6 - 17 and 18 - 29 months). There is a need for better, standardised and routine data collection to determine burden and more studies to determine treatment options. A global database that includes admissions for oedema should be included in each country's surveillance system.



© UNICEF/NYHQ2005-2164/Rizzoli, DRC, 2005

Putting kwashiorkor on the Map (Briend et al, 2013) started as a call for sharing data to give an idea of prevalence and raise the profile of kwashiorkor. In order to help fill data gaps and obtain a more comprehensive understanding of the global situation for kwashiorkor, Phase Two of the project was launched in September 2014 with funding assistance from UNICEF. A kwashiorkor Mapping Core Group was established to manage the project outputs including data collection, interpretation and documentation. The aims of Phase Two are:

1. To refine and update the initial kwashiorkor map, provide a broad estimate of the numbers and location of cases of kwashiorkor and identify high burden countries/areas.
2. To strengthen the evidence base and support advocacy for inclusion of kwashiorkor in relevant methodology discussions at global level.

A Technical Brief has been produced which findings are summarised in this article.

Extent of the problem

This report highlights the importance of kwashiorkor as a public health problem, as reflected by its prevalence and also by the proportion of SAM cases it represents in surveys. Kwashiorkor, is an acute condition, and standard cross-sectional surveys are not adapted to assess the real importance of this problem. The high proportion of kwashiorkor reported among SAM children admitted for treatment in some areas where its prevalence is low shows the difficulty in assessing the extent of this problem. For example, the reported prevalence of oedema during the last ten years was less than 1% in most of the countries where data was available but when examining the estimate proportion of SAM cases with kwashiorkor, figures ranged between 50% in Malawi, to 32% in the Democratic Republic of Congo and just 1.6% in Pakistan. This suggests that kwashiorkor is probably far more extensive than what cross-sectional surveys show. Certain types of studies, such as incidence studies or community studies with regular active case finding, may be

better suited to more accurately describe the burden of oedema in countries.

Geographical distribution of kwashiorkor

Despite its limitations, this report gives, for the first time, a representation of the geographic distribution of kwashiorkor, based on 2,515 datasets with information on more than 1,736,000 individual children collected from 55 countries during the time period 1992 to 2015. It shows that this form of malnutrition occurs most frequently in some parts of Africa, specifically around the equator. This is consistent with what has been reported for more than 40 years in West Africa. DRC is the highest burden country in the world with respect to oedema prevalence and surveys from a significant number of countries in Africa indicated that more than a third of SAM cases defined by MUAC <115mm or oedema had kwashiorkor, including Malawi, Rwanda, Zambia, Togo, and Cameroon. Notably, the data from Malawi estimated that half of all SAM cases had kwashiorkor. Once again, Malawi, DRC, Haiti and Zambia were found to have some of the highest rates of kwashiorkor admissions. Oedema prevalence was greatest in the youngest age groups (6-17 and 18-29 months) and no difference on prevalence was found among sexes but when SAM was defined by MUAC <115mm or oedema, the proportion of males with oedema among those with SAM was consistently higher than that of females.

Association with background malnutrition and mortality

This report also highlights the high variation of malnutrition associated with oedema. Many oedematous children would not be classified as having SAM if only MUAC or WHZ were considered. Arguably, the interpretation of nutritional status with WHZ is flawed in children with oedema due to weight increase caused by oedema, but this report shows that oedema cases often have low WHZ (the median WHZ score for children with oedema was -1.55 and for those without oedema, -0.62). MUAC measures also tended to fluctuate in generalised oedema.

MUAC is less sensitive to changes in hydration status and seems better for assessing the general nutritional status of children with oedema that does not extend up to the child's upper arms (i.e., +++ oedema). This latter assumption is supported by the ROC curves in this report that describe the association between anthropometry and oedema, showing that MUAC more readily identifies children with oedema, compared to WHZ.

Mortality associated with kwashiorkor also varies across studies, with some reporting lower, identical or higher mortality compared to non-oedematous malnutrition. These discordant observations may be related to a different level of associated malnutrition. In children with SAM, the presence of oedema is considered as an aggravating factor associated with a higher risk of death as reported by a number of studies but some of the patterns analysed may be indicative of no association. However, the lack of actual and reliable data hinders the assessment and comparison of the mortality rates between the 3 types of SAM, as well as the identification of prognostic factors that could guide the treatment of these patients.

Poor association between prevalence surveys and admission data

Another important finding of this report is that standard cross-sectional surveys do not adequately reflect the clinical importance of kwashiorkor, since there appears to be a lack of a relationship between admission data and kwashiorkor prevalence obtained from surveys. The possible reasons for this discrepancy are many and should be explored. A possibly poorly adapted survey methodology with insufficient standardisation for collection of oedema data should be considered first. The recommendation of national protocols in terms of referral to inpatient care, the existence of community-based management of acute malnutrition in the country or the level of community

¹ Alvarez JL, Dent D, Browne L, Myatt M and Briend A. Putting Putting child kwashiorkor on the map. CMAM Forum Technical Brief, March 2016. <http://www.cmamforum.org/Pool/Resources/Putting-Kwashiorkor-on-the-Map.pdf>

mobilisation activities were not assessed in relation to each annual national admission dataset. It is therefore uncertain whether variations in the level of inpatient care for oedematous children were due to country policy or severity of cases.

It is possible that duration of oedematous malnutrition is not the same in different settings, in particular as a result of the very different degree of associated malnutrition. This may have an influence on the associated mortality and/or on the rapidity of recovery, both of which can have an influence on the probability of finding oedematous cases during a nutritional survey.

High variations of association with background malnutrition and with mortality and poor association between results of prevalence surveys and admission data are factors that could also be related to the shift in treatment with the introduction of community-based management of acute malnutrition (CMAM) around 2005, where oedema + or ++ (variation between agencies) moved from being treated only in an inpatient setting to being

treated in an outpatient setting. Ideally inpatient admissions could be interpreted on a timescale in relation to the country protocols at that time, but given the historical data used, exact admission protocols at the time were not available.

Data collection and standardisation

It is made clear throughout the report that better collection methodologies on kwashiorkor data and improvements to the current survey reporting system are needed (see article in this edition of *Field Exchange* elaborating on data challenges in the meta-analysis undertaken). Additionally, a global database that includes admissions for oedema should be included in each country's surveillance system.

References

Briend A, Myatt M, Dent N, Brown R. *Putting kwashiorkor on the map*. CMAM Forum request for data 2013. www.cmamforum.org/Pool/Resources/Putting-kwashiorkor-on-the-map-CMAM-Forum-2013.pdf

Box 1 Key findings of the report

1. There is a need for better, standardised and routine data collection to correctly identify the burden of kwashiorkor across the world.
2. High rates of oedema were reported in Central and Southern Africa, as well as Haiti. When examining the proportion of SAM cases with kwashiorkor, surveys from a significant number of countries indicated that more than a third of SAM cases had kwashiorkor, including Malawi, Rwanda, Zambia, Togo and Cameroon.
3. Mortality rates are highest among children who have MUAC <115mm and oedema (marasmic kwashiorkor).
4. Oedema prevalence was greatest in the youngest age groups (6 - 17 and 18 - 29 months).
5. There is a need for more studies to provide evidence-based prognoses and specific treatment recommendations relating to kwashiorkor.



Improving the quality of nutritional survey data worldwide

Putting Child Kwashiorkor on the Map Initiative

Summary of research¹

By Lauren Browne

Lauren Browne is the Data Manager for the Kwashiorkor Mapping project and joined the team after interning with ACF-UK and Save the Children UK. She completed her Master of Science in Nutrition for Global Health at the London School of Hygiene and Tropical Medicine and previously served as a Peace Corps Volunteer for the US Government.

Location: Global

What we know: Kwashiorkor, or oedematous malnutrition, is overlooked in scientific and public health fora. The burden of kwashiorkor is unknown; metadata analysis has the potential to fill this information gap.

What this article adds: A CMAM Forum/ACF-UK/UNICEF/WHO collaboration undertook an updated mapping to estimate the numbers and location of kwashiorkor and identify high burden countries/areas. A total of 2,350 datasets from various UN/NGO/government sources were included. Significant limitations to the meta-analysis included barriers to data access, lack of standard formats (file names, datasheet types, varied coding and classifications between surveys), poor data quality, missing variables, no access to raw data, and duplicate surveys shared. Only one out of 36 MICS4 surveys included MUAC; all DHS surveys were missing both MUAC and oedema variables. There is a clear need for defined standards for all nutritional survey data, better overview of data quality and improved storage of raw original datasets. A minimal set of data, including MUAC and oedema, should be included in DHS, MICS and SMART surveys. Going forward, an expert inter-agency group should determine standard definitions, labels, codes and units for all indicators deemed to be of importance for inclusion in nutritional surveys. This group could facilitate management of an open access or licence-accessed central data repository for professionals and researchers.

Summary of the Putting Child Kwashiorkor on the Map initiative

Putting Child Kwashiorkor on the Map was a collaborative effort between the CMAM Forum, ACF-UK, UNICEF and WHO. The current phase of the project (Phase 2) was launched in late 2014 to help improve and strengthen the data used for the map produced in the first phase of mapping conducted in 2013 (Alvarez et al, 2013). The aims of Phase 2 were:

1. To refine and update the initial kwashiorkor map, provide a broad estimate of the numbers and location of kwashiorkor and identify high burden countries/areas; and
2. To strengthen the evidence base and support advocacy for inclusion of kwashiorkor in relevant methodology discussions at global level.

Non-governmental organisations (NGOs), United Nations (UN) agencies and governments involved with nutrition programmes were asked to share nutritional surveys. Requests were accompanied by a project information sheet and a data-sharing letter of agreement. A Technical Advisory Group (representatives from Centers for Disease Control and Prevention (CDC); CRED/University Uclouvain; Jimma University Ethiopia; Kenya Medical Research Institute (KEMRI); Mwanamugimu Nutrition Unit, Uganda; Médecins Sans Frontières (MSF); Washington University in St. Louis; University of Tampere and Valid International) guided the type of information to be collected, the database construction, the analyses and the final report.

Any nutritional survey adopting the SMART methodology (or similar methodology used before the development of SMART), with Population Proportional to Size (PPS) or exhaustive sampling,

simple random sampling or systematic sampling, and including the variables age, sex, weight, height, mid-upper arm circumference (MUAC) and presence or absence of bilateral pitting oedema for children aged 6-59 months was deemed eligible for inclusion in a central database.

Project outcomes

The initial map from Phase 1 (557 surveys held by Brixton Health) was updated during Phase 2 with more robust estimates of the prevalence of kwashiorkor based on a total of 2,277 surveys collected from 11 NGOs (*ACE, Concern Worldwide, GOAL, IMC, IRC, MSF, Plan International, Save the Children, Terre des Hommes, World Vision and Zerca y Lejos*), 15 national governments/UNICEF, FEWS NET¹, FSNAU² and UNHCR for 55 countries. The eligible surveys were conducted from 1992 to 2015 and included the data of over 1.7 million children. Outcomes in terms of prevalence are included in an accompanying article in this edition of *Field Exchange*.

Findings and implications

One of the findings from the project was the "... need for systematic collection, storage, and standardisation of nutritional survey data, software and definitions... Inconsistencies were found across surveys, including lack of a standard format, varying codes for some indicators, loss of original files (often with past employees who left or through corrupted files), no clear contact person, etc. Variation was found in the type of software used, coding/labelling and units..." This article aims to expand on this finding and provide a more detailed description of the data issues encountered; specifically the barriers to data access, lack of standardisation, poor data quality, missing variables and receipt of raw and cleaned data.

Barriers to data access

Obtaining data permission was often a very lengthy process and some countries did not provide permission for use of nutritional surveys outside the country of origin. Furthermore, data agreements specified restrictions on use of the data and were time-bound. These problems are often encountered by researchers and have previously been discussed in *Field Exchange* (Guerrero, 2015).

Lack of standardisation

Surveys were received in five different formats (ENA³ for SMART, EpiInfo/EpiData (REC), STATA, SPSS and Excel), which required time-consuming file conversions to the common CSV format needed to aggregate all the data within the analytical software (R Analytic Flow was the statistical programme utilised for the project). Some files received were corrupted, most likely due to ineffective conversions, while others were received in unfamiliar formats that could not be converted.

Twenty-nine (18%) of the ineligible datasets were excluded because file labelling was poor and inadequate descriptive information was provided about the survey, such as location.

The metadata provided for surveys varied widely, was not standardised and was often either not present, coded opaquely, or classified differently. For instance, in those datasets that identified

the population type, the definitions used by organisations to describe the surveyed population varied. Some surveys used general classifications (e.g. rural or urban) for the variable, while others disaggregated it into sub-groups (e.g. agrarian or pastoralist, instead of rural). Unknown codes utilised for variables were a problem for 11% (n=18) of the excluded datasets; some indicators were coded differently by different agencies and even in surveys conducted by the same agency, specifically oedema and sex.

Poor data quality

Data entry errors were extremely common in the received datasets, with values often typed into the wrong columns or typed incorrectly. The MUAC variable was most often recorded incorrectly and was sometimes recorded in both millimetres and centimetres within the same dataset. Very extreme values came up frequently for MUAC but also occurred for weight and height.

Missing variables

A total of 2,515 datasets were received, with nearly 7% (n=165) not eligible for inclusion in the database since they were missing one or more of the needed key variables (age, sex, weight, height, MUAC and/or oedema). No Demographic Health Survey (DHS) datasets had all the required variables (all were missing both the MUAC and oedema variables). Only Multiple Indicator Cluster Survey (MICS) 4 databases were sourced, since only MICS4 could potentially have all the variables needed. Of 36 MICS4 databases received, 35 were missing the MUAC variable and so were ineligible for inclusion. Overall, 63% (n=105) of the excluded datasets were missing MUAC; fewer were missing oedema or other variables.

A total of 114 children with oedema had incomplete case records, meaning they did not have one or more of the accompanying variables recorded (age, sex, weight, height or MUAC) and were therefore not included in the database. Of these, 83% (n=95) were missing MUAC, with the majority of the rest missing weight and/or height.

Receipt of raw and cleaned data

Raw data was specifically requested, but agencies found it difficult to locate all the original raw datasets, especially from older surveys. Many agencies had lost the data and could only provide narrative reports.

It was unclear whether datasets had already been cleaned prior to receipt, so an unknown number of included surveys were either cleaned based on the contributing organisation's standards or the project's standards, resulting in variability. Furthermore, agencies may have used WHO and/or SMART flagging criteria, either deleting flagged records or leaving them in, which was not evident from the datasets received.

Of the 2,350 eligible datasets, over 3% (n=73) were identified as duplicates, due to inter-agency collaboration during surveys and shared ownership of the data. Potential duplicate datasets were identified via the calculation of file-level checksums. However, the duplicate code could not account for cleaning differences among data entry

persons, so this may have prevented some duplicate surveys from being detected. For example, if the same dataset had been cleaned by one collaborating organisation but not the other prior to sharing, then the code used for the analyses would not have picked up the duplicate dataset. It was not possible to systematically spot by eye all additional duplicates that could have been missed by the code due to the extensive nature of the database. The provision of raw original data by all organisations involved would have prevented these difficulties, thus minimising the number of duplicated dataset omissions.

Recommendations for the improvement of survey quality

It is recommended that in the future, a minimal set of data (including especially MUAC and oedema, since these are admission criteria for services managing acute malnutrition) be collected across all nutritional surveys, including standard national surveys like SMART, MICS and DHS.

Systematic storage of raw datasets, particularly in a common format (e.g. CSV) often used in large international research projects, should be prioritised, done at headquarter or country level and stored with the accompanying narrative reports.

It is important that nutritional survey datasets are properly standardised. It is recommended that an international, inter-agency technical advisory group determine standard definitions, labels, codes and units for all variables to be automatically included in nutrition surveys, including definitions for a minimal set of metadata. In addition, basic information must be integrated into each dataset, ideally in the file name.

Conclusions and the way forward

There is a clear need for defined standards for all nutritional survey data (especially surrounding file type and labels, codes, variables and metadata), better overview of data quality and improved storage of raw original datasets.

Going forward, an expert inter-agency group should determine standard definitions, labels, codes and units for all indicators deemed to be of importance for inclusion in nutritional surveys. In addition, if widely agreed, this group could facilitate management of an open access or licence-accessed central data repository for professionals and researchers.

For more information, contact: Lauren Browne, email: lmb7j@virginia.edu

¹ Famine Early Warning Systems Network.

² Food Security and Nutrition Analysis Unit, Somalia.

³ ENA (Emergency Nutrition Assessment) software is an analytical programme recommended by SMART.

References

- Alvarez JL, Dent N, Browne L, Myatt M, & Briend A. *Putting Child Kwashiorkor on the Map*. CMAM Forum Technical brief. London, March 2016. www.cmamforum.org/Pool/Resources/Putting-kwashiorkor-on-the-map-CMAM-Forum-2013.pdf.
- Guerrero S. Strength in Numbers. *Field Exchange* 50. August 2015. p76. ENN.

Community-based management of severe malnutrition

SAM and SUW in children under five in the Melghat tribal area, central India

Summary of research¹

By Dr Vibhavari Dani, Dr Ashish Satav, Mrs Jayashri Pendharkar, Dr Kavita Satav, Dr Ajay Sadanshiv, Dr Ambadas S Adhav and Dr Bharat S Thakare



Dr. Vibhavari Dani is a pediatrician and Head of the Research Division, MAHAN (Meditation, AIDS, Health, De-Addiction, Nutrition), Melghat. She is the principal investigator of the study and helped in planning the research, monitoring and training staff and treatment of non-responding cases.



Dr. Ashish Satav is President of MAHAN, Melghat. He is co-Principal Investigator and helped in planning the research, monitoring and training of staff and arranging resources needed for the research.

Mrs. Jayashri Pendharkar works in the Department of Dietetics and is Nutrition Consultant and Treasurer at MAHAN, Melghat. She helped in planning therapeutic food dishes and training for the same.

Dr. Kavita Satav helped in mobilisation of resources, motivating co-Principal Investigators in starting the study and helping in recipe planning.

Dr. Ajay Sadanshiv is Chief Trainer and Chief Medical Officer with MAHAN.

Dr. Ambadas S Adhav is Project Manager. He helped in managing the project and regular monitoring.

Dr. Bharat S Thakare is Administrative Officer and Project Manager at MAHAN, Melghat. He helped in monitoring therapeutic food preparation, the calculation of nutritious food needed for RUTF and monitoring and cleaning data.

The authors would like to acknowledge caring friends in Mumbai for funding from Stichting Geron and Cordaid, Netherlands, guidance from Dr. Abhay Bang of SEARCH on the home-based child-care programme and Dr Raj Bhandari for his detailed review of this article.

ENN also extend thanks to Tanya Khara and the Valid India Trust for reviewing this article.

Location: *Melghat, India*

What we know: Severe acute malnutrition (SAM) and severe underweight (SUW) are prevalent among tribal community children in Melghat. Access to hospital-based treatment is limited; community-based treatment is not available.

What this article adds: A community-based prospective trial to treat SAM and SUW was conducted in tribal Melghat from August-October 2012, with six-month follow-up. A sample of 145 severely malnourished children (aged six to 60 months) was selected using a one-stage cluster sampling from 14 randomly chosen villages. Locally prepared therapeutic food (MAHAN-LTF) with micronutrients, infection treatment and behaviour-change communication were provided by Village Health Workers (VHWs) for 90 days. After eight weeks, 55.1% of SAM cases and 15.6% of SUW children had recovered. At 12 weeks, 63% of SAM and 28.7% of SUW cases had recovered. Case fatality rate for SAM was 2.0% and 0.8% for SUW. A recorded history of low birth weight (LBW) was found in 42.9% of SAM children and 46.9% of SUW children. The six-month relapse rates for recovered SAM and SUW were 3.03% and 11.1% respectively. Further research on community-based management of SUW is needed. This study will inform an ongoing randomised control trial on community-based management.

Introduction

Globally, malnutrition remains one of the leading causes of morbidity and mortality among children (Caulfield et al, 2005; Bhan et al, 2003; David, 1993), contributing to 60% of deaths in children aged under five (Caulfield et al, 2005; WHO, 1999). The prevalence of underweight children in India is among the highest in the world (for example, it is nearly double that of sub-Saharan Africa), with dire consequences for morbidity, mortality, productivity and economic growth (Gragnotati M, 2005). Prevalence of malnutrition among children remains alarmingly high in India, particularly among tribal populations. As per the National Nutrition Monitoring Bureau report 2009, the prevalence among one to five-year-olds is 6% for severe acute malnutrition (SAM), 20% for severe underweight (SUW) and 26% for severe stunting in tribal India (NNMB, 2009). Another study in tribal Maharashtra found prevalence of 7% SAM, 29% SUW and 30% severe stunting, considered 'very high' by WHO standards (Meshram et al, 2012; WHO Database). A study by the authors in 2012 showed very high (WHO Database) prevalence of severe malnutrition (7.1% SAM, 18.7% SUW, 34.4% severe stunting, and 6.7% grade III-IV malnourished (Indian Academy of Paediatrics (IAP)) in children under five years in Melghat (Daniet al, 2014). Major contributing factors for severe malnutrition are poor child-feeding practices, infectious disease, and poor hygiene and sanitation (Meshram et al, 2012; Amsalu et al, 2008; Bantamen et al, 2014). Co-existing infection increases risk of death among severely malnourished children (Ashworth, 2006).

Melghat is a difficult-to-reach, hilly, forest area in the state of Maharashtra, central India, with a population of 300,000 scattered over 320 villages, spread over 4,000 sq kms. Around 85% of the population is tribal, of whom more than 90% are small farmers or agricultural labourers living below the poverty line (Govt. of Maharashtra, 2009; MAHAN, unpublished). Medical facilities in the tribal area of Melghat are grossly inadequate and health-seeking behaviour is low (Satav et al, 2011; Govt. of Maharashtra; 2009). Hospital-based treatment is limited in coverage and impact. There is no specific programme to tackle this heavy burden of severe malnutrition in children aged six months to five years age and no community-based option. July to October is the period of heavy rainfall associated with a significant rise in infections, leading to increased malnutrition and child deaths within the year.

Given the above and the evidence around the community-based management of acute malnutrition approach (WHO/UNICEF/WFP/ SCN, 2007; Manary et al, 2004; Schoones et al, 2013), a one-stage, cluster randomised controlled trial for community-based management of severe malnutrition is underway, targeted at children aged six to 60 months in Melghat. It involved provision of local adapted therapeutic food (LTF) fortified with micronutrients, home-based treatment of infectious diseases and behaviour-change communication (BCC) delivered through village health workers (VHWs). Within this trial, a pilot study was conducted on community-based management and is described in this article.

Box 1 MAHAN-LTF with added micronutrients (MAHAN-LTFMN)

MAHAN-LTFMN is a local adaptation of the diet, prepared by local tribal women in the form of six palatable dishes (chivada, groundnut tilgul patti, dalia poha, moong dal khichri, groundnut sago, bhajani thalipeeth/upama). The therapeutic foods are prepared from ingredients such as groundnuts, oil, rice, sesame, jaggery, tapioca, gram dal, moong dal, etc. These ingredients are locally available, acceptable to the children, can be prepared by tribal women with minimum infrastructure, are palatable, and most have a shelf life of up to 21 days. Each 100g packet of MAHAN-LTFMN provides 500 to 550 kcals and around 15-17g of protein, according to the WHO formulation (WHO, 2007). Depending on the micronutrient deficit in each recipe, they were supplemented with micronutrients using a MAHAN VITAMIN mix powder produced by a pharmaceutical company.

Methods

This community-based prospective trial with one-stage cluster sampling method was conducted in the Dharni and Chikhaldara blocks in the tribal area of Melghat over a period of three months (August to October 2012). The sampling frame was all severely malnourished children (SMC) aged six to 60 months in 320 villages, from which 14 villages were randomly selected. The sample constituted 145 randomly selected target children from the usual resident population.

SAM was defined as weight-for-height Z scores (WHZ) $\leq 3SD$ with or without bilateral oedema. The presence of bilateral oedema was classified as SAM independent of WHZ. Underweight was defined as weight-for-age using WHO standardised Z scores (WAZ). SUW was defined as weight-for-age Z score (WAZ) $\leq 3SD$ (WHO, 2006). IAP gradations were defined as per percentage of expected weight for age: grade III: 50-60%, grade IV: $<50\%$ of expected weight (Achar, 1982). Customised software MAHANsoft

version 1.0, 2011 was used for data entry and gradation purpose.

The project was implemented by the MAHAN (Meditation, AIDS, Health, De-Addiction, Nutrition) Trust, Melghat, in each village through semi-literate, tribal, local married women working as VHWs. One VHW per village was selected during Gram Sabhas (village meetings)¹, which increased acceptance by the community. The villages have an average population of 900. VHWs were paid an honorarium as an incentive. They were trained on anthropometric assessment; feeding MAHAN-LTF with micronutrients (MAHAN-LTFMN, see Box 1); treatment of infectious diseases; and BCC through health education of parents. A total of 14 VHWs in 14 villages were involved.

Written informed consent was sought from the villagers during Gram Sabhas organised in each of the selected villages. The study received approval from the institutional ethical committee, which has six external members as per the recommendations of the Indian Council of Medical Research. The food material and associated set-up was approved by the Food and Drug Administration (FDA) of Amaravati.

In July 2012, anthropometry was measured in all targeted children by VHWs and cross-checked by medical supervisors (specially trained doctor and auxiliary nurse midwives (ANMs)). Anthropometry included weight, measured by standardised Salter weighing machines, and height/length, recorded by standardised stadiometers.

Out of 145 study subjects, 59 were identified with SAM, 125 as SUW, 59 as IAP grade III-IV malnourished and 92 as severely stunted. Many children were suffering from acute-on-chronic malnutrition (SUW) and/or fell into more than one category of severe malnutrition. Parents of these severely malnourished children (SMC) were beneficiaries for BCC during the study period.

All identified severely malnourished children undertook an appetite test as per WHO guidelines

(WHO, 2007). Children were screened for medical complications and those with serious illness were referred to hospital. Those who were not willing to go to hospital were managed by VHWs after providing high-risk written consent. Those who passed the appetite test were enrolled for 90 days of MAHAN-LTFMN therapy. If a child recovered before 90 days, they were still retained in the programme for the duration.

MAHAN-LTFMN was given to severely malnourished children four times a day under direct supervision of VHWs for 90 days. Children attended the house of the VHW for feeding observation; only in exceptional cases were cases fed at home (e.g. parents working away from home on a remote farm). Parents were asked not to give any other food during the course of therapy. According to the child's weight, a specified amount of feed was provided so that all children received four to six grams of protein/kg/day and 175 kcal/kg/day, with gradual escalation. Anthropometry of enrolled children was monitored weekly for 12 weeks. Quality control of MAHAN-LTFMN involved random checking for accuracy of exact weight of each ingredient and hygiene. A taste register was maintained for any adverse reaction and palatability issues. At the outset, external quality control was undertaken by the District FDA Department.

The trained VHWs provided treatment for infectious diseases, such as fever, diarrhoea, acute respiratory infection (ARI), otitis media, malaria, deworming, etc. using paracetamol, norfloxacin, half-strength oral rehydration solution (ORS), amoxicillin, chloroquine and albendazole in appropriate doses (WHO, 2007). BCC of parents involved health education regarding hand-washing, nail-cutting, hygiene and nutrition through counselling, flipcharts, audio-visual film screening, practical demonstrations and street play. All activities were supervised weekly by medical supervisors and fortnightly by BCC supervisors.

Study limiting factors

Melghat is characterised by hilly, forest terrain with poor round-the-year availability of transportation and drivable roads. Annual rainfall is 1,500 mm and there are frequent flash floods. Heavy rainfall and floods led to interrupted supply of MAHAN-LTFMN to some villages. During the rainy season, it was difficult to maintain proper hygiene and sanitation at the storage and feeding sites of MAHAN-LTFMN in the villages. Although MAHAN-LTFMN preparations were made on the basis of socio-cultural habits and palatability, some of the preparations were not accepted by children and others had a lower shelf life than intended. As this was a new project, despite intensive training, VHWs and supervisors made mistakes in maintaining records. Weekly anthropometry records for a control group were not feasible, hence a randomised control trial was not possible.

Table 1 Background characteristics of severely malnourished children (SMC)

	SAM		SUW		IAP grade III-IV		Total SMC*	
Distribution of severe malnutrition (n)	59		125		59		145	
Gender	No.	%	No.	%	No.	%	No.	%
Males	33	55.9	68	54.4	29	49.2	74	51.0
Females	26	44.1	57	45.6	30	50.8	71	49.0
Age group								
6 to <24 months	34	57.6	46	36.8	10	16.9	61	42.1
24-60 months	25	42.4	79	63.2	49	83.1	84	57.9
Low birth weight (LBW)	18 (n=42)	42.9	45 (n=96)	46.9	25 (n=51)	49.0	46 (n=109)	42.2
Full term LBW	17	94.4	43	95.6	24	96.0	44	95.7
Pre term LBW	1	5.6	2	4.4	1	4.0	2	4.3
**Complicated SMC at enrolment								
Complicated	4	6.8	14	11.2	5	8.5	15	10.3
Non-Complicated	55	93.2	111	88.8	54	91.5	130	89.7

* A child could be included in more than one severe malnutrition classification

** Complicated severe malnutrition is determined by presence of bilateral oedema and/or negative appetite test and/or any other illness.

¹ The Gram Sabha is the foundation of the Panchayati Raj system and formal unit of local government.

Results

Table 1 shows the background characteristics of the 145 study subjects. The distribution of study subjects was SAM 40.7% (59), SUW 86.2% (125), and IAP grade III-IV malnourished 40.7% (59). Male and female distribution was almost equal in total number of severely malnourished children. SAM was seen in more than 57% children aged 6-<24 months, while SUW was seen in almost two-thirds of children in the 24-60 months age group. IAP grade III-IV was seen in more than three-quarters of children in the 24-60 months age group. Low birth weight (LBW) was found in 42.9% of SAM children and 46.9% of SUW children (as measured by VHWs and supervisors (Bhan et al, 2003)); 95% of these were full-term LBW. There were 15 cases of complicated severe malnutrition (10.3%), who were referred to hospital but refused.

Table 2 shows recovery of severely malnourished child (SMC) and weight gain (g/kg/day) of recovered children at the end of the 8th, 10th and 12th week of MAHAN-LTFMN therapy. Recovery of SAM children was 55.1% at the end of eight weeks and 63% by the end of therapy. At the end of eight weeks, out of a total 49 enrolled SAM children, 27 (55.1%) recovered. At the end of 10th week, one recovered child

dropped out, three recovered children relapsed and there was no new recovery. Thus, 23 (47.9%) out of 48 SAM remained recovered at the end of 10th week. At the end of the 12th week, out of seven dropouts, six were recovered children. Three children relapsed and four new children recovered. Thus, 18 (43.9%) out of 41 SAM remain recovered. In all, a total 31 children (63%) out of 49 SAMs were recovered by the end of therapy.

Recovery of SUW children is found to be 15.6% at the end of eight weeks and 28.7% by the end of therapy. At the end of eight weeks; out of a total 115 enrolled SUW children, 18 (15.6%) recovered. At the end of the 10th week, four out of five children that dropped out had recovered, five recovered children relapsed and nine children were newly recovered. Thus, 18 (16.3%) out of 110 SUW remained recovered at the end of 10th week. At the end of the 12th week, out of 25 dropouts, five were recovered children. Eight children relapsed and six new children recovered. Thus, 11 (12.9%) out of 85 SUW recovered. In all, total 33 children (28.7%) were recovered out of 115 SUWs by the end of therapy.

The children who relapsed during therapy did so either due to irregular attendance or episodes of infection. At the time of enrolment,

there were 92 severely stunted children; none recovered by the end of therapy.

Paired t test for both SAM and SUW before and after the eight-week, ten-week and 12-week MAHAN-LTF intervention is significant ($p < 0.001$).

Weight gain among SAM children after the 8th, 10th and 12th week was 3.0, 2.6 and 2.5 g/kg/d respectively; among SUW it was 3.0, 1.9 and 1.7 g/kg/d respectively. For IAP grade III-IV, weight gain was 3.1, 2.0 and 1.8 g/kg/d after the 8th, 10th and 12th week respectively. There were 14 dropouts and one death after eight weeks, five more dropouts after 10 weeks, and 26 more dropouts before completion of therapy. The case fatality rate (CFR) for treated SMC was 0.7%. The CFR was 1.7% for SAM, 0.8% for SUW and 1.7% for IAP grade III-IV.

Figure 1 shows the percentage weight gain in recovered SAM children (WHZ <-3 SD) after eight weeks of MAHAN-LTFMN. Recovery from SAM was seen in 27 (55.1%) out of 49 children. The percentage of weight gain among 17 cases (63.0%) of recovered SAM was <15%; for ten cases (37.0%) of recovered SAM it was $\geq 15\%$.

Figure 2 shows episodes of fever, diarrhoea and ARI in SAM children. A gap of seven days

Table 2 Recovery and weight gain (g/kg/day) in severely malnourished children

	Number	Recovered SMC		Weight gain in g/kg/day in recovered children
		No.	%	
At the end of week 8 (n=130)				
SAM*	49	27	55.1	3.0
SUW**	115	18	15.6	3.0
Grade III-IV	56	24	42.8	3.1
Dropouts	14			
Died	1			
*(paired t test: $t = 5.86, df = 48, p < 0.001$) ** (paired t test: $t = 7.44, df = 114, p < 0.001$)				
At the end of week 10 (n=125)				
SAM*	48	23	47.9	2.6
SUW**	110	18	16.3	1.9
Grade III-IV	53	18	33.9	2.0
Dropouts	5			
Died	0			
*(paired t test: $t = 5.06, df = 47, p < 0.001$) ** (paired t test: $t = 7.22, df = 109, p < 0.001$)				
At the end of week 12 (n=99)				
SAM*	41	18	43.9	2.5
SUW**	85	11	12.9	1.7
Grade III-IV	46	17	36.9	1.8
Dropouts	26			
Died	0			
*(paired t test: $t = 5.97, df = 40, p < 0.001$) ** (paired t test: $t = 9.05, df = 84, p < 0.001$)				

SMC: severely malnourished child; SAM: severe acute malnutrition; SUW: severe underweight

Table 3 Rate of relapse in recovered SMCs

Recovered children	Relapse at the end of sixth month post discharge	
	No.	%
SAM (n=27)	1	3.03
SUW (n=18)	2	11.1
IAP grade III-IV (n=24)	5	20.8

Figure 1 Percentage weight gain in recovered SAM children after 8 weeks

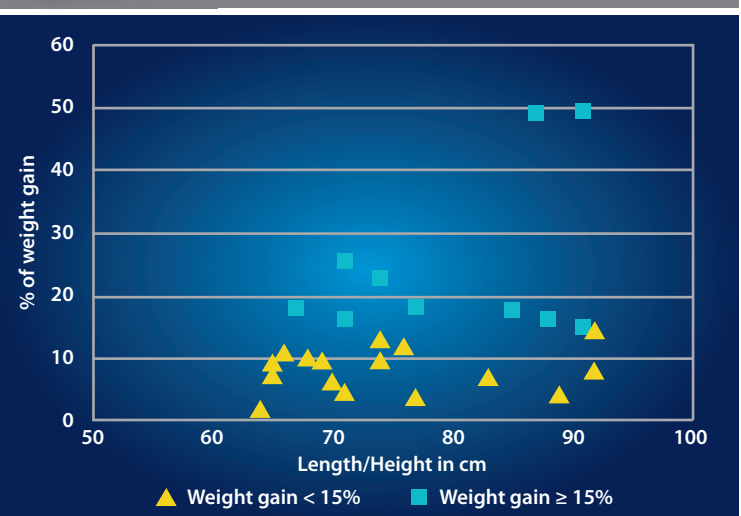
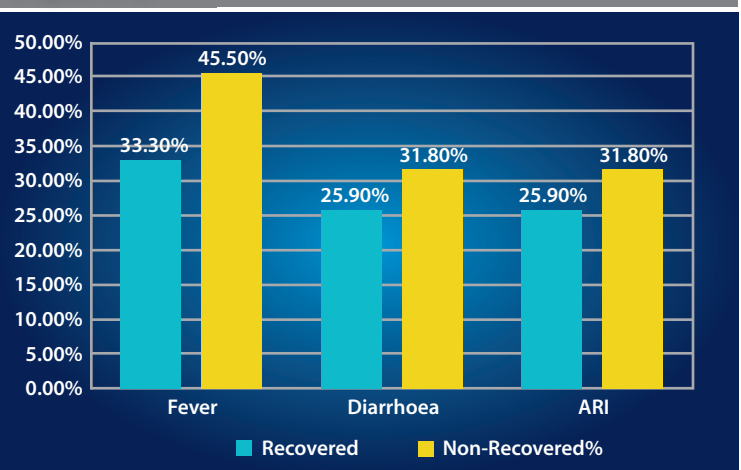


Figure 2 Episodes of fever, diarrhoea and acute respiratory infection (ARI) in SAM children





between two episodes was factored into data gathered. Non-recovered children had more episodes of infection.

On discharge, all SMCs who had recovered at eight weeks were followed up for six months. Table 3 shows the rate of relapse in recovered SMCs. Of 27 recovered SAM children, one child (3.03%) relapsed; out of 18 recovered SUW children, two children (11.1%) relapsed, and out of 24 recovered IAP grade III-IV, five children (20.8%) relapsed.

Discussion

In our previous study, we had shown that the prevalence of SUW in the tribal community of Melghat is 18.7% and that of SAM is 7.1% (Dani et al, 2014). Co-existence of acute and chronic malnutrition needs to be comprehensively addressed with combined multiple approaches (Bergeron et al, 2012). It is therefore necessary to include SUW children, in addition to SAM cases, in a community-based therapeutic feeding project. We could not find any study on community-based management of SUW children. In this study, almost half of the SUWs were full-term LBW infants reflecting intra-uterine growth retardation; i.e. they were born malnourished.

Maternal and child health and nutrition services are required for prevention of chronic malnutrition. However, for management of severe, acute-on chronic malnutrition (SUW), our treatment regime of MAHAN-LTFMN achieved just 16.3% recovery. Relapse rate was greater among recovered SUW and IAP grade III-IV children compared to SAM children. It remains to be seen whether children with acute-on chronic malnutrition need longer follow-up, further investigations for chronic diseases and longer duration of therapy. A study published in 2001, based on the systematic review of studies published in the 1980s and 1990s, revealed that only six out of the 27 studies achieved case fatality rates of <5% and relapse/readmission rates of <10%, which can be taken as standard (Ashworth, 2001).

The duration of this pilot study was kept as 12 weeks and recovery from severe malnutrition at the end of the 8th, 10th and 12th week was assessed. We found maximum recovery and daily weight gain at the end of the 8th week. Over half (55.1%) SAM children recovered from severe malnutrition, with an average weight gain of 3.0 g/kg/day after eight weeks. The rate of weight gain decreased by the end of ten and 12 weeks of treatment. It is possible that rapid weight gain occurs when a child is wasted; as the child approaches a normal weight for height, the rate of weight gain falls (Ashworth, 2006). This fall in daily weight gain rate may reflect a greater proportion of defaulters as the duration of therapy lengthens.

Studies from India and elsewhere have discussed evidence-based possible interventions to address SAM, but the co-existence of acute and acute-on-chronic malnutrition in India cannot be denied and also needs to be addressed

(NNMB, 2009; Meshram et al, 2012; WHO database; Dani et al, 2014). The preventive approach of addressing acute-on-chronic malnutrition will benefit future generations, but treatment is urgently needed for those who are already malnourished. The response to treatment demonstrated through this intervention is encouraging. More research needs to be done to determine the exact nature and duration of therapy for these children.

Weight gains up to 15% were seen in 63% of the recovered SAM children. Weight gain of 15% to 49% was seen in 37% of recovered SAM children; these children had good appetite, no episodes of infections, were non-defaulters and showed no relapse at the end of six months follow-up. Episodes of fever, diarrhoea and ARI were more common in non-recovered SAM children compared to recovered SAM. This indicates that timely treatment of infections in the community by trained VHWs will improve recovery rates and prevent relapse of severe malnutrition; it is important that a good referral system should be established.

Conclusions

Community-based management of severe malnutrition is possible and the treatment of SUW children has good potential. This pilot study is a part of a larger study which is underway with a sample size of 1,500 SMCs in each arm of an RCT. Such programmes lead to capacity-building of the community to deal with the menace of malnutrition. This study seems to demonstrate that this treatment approach is acceptable, cost-effective, achievable, safe and feasible with locally available manpower and resources.

For more information, Dr. Ashish Satav, email: drsata@rediffmail.com; tel: +919423118877

References:

Achar 1982. *The Classification by Nutrition Sub-committee of Indian Academy of Pediatrics*. Report. Indian Pediatr 1972; 9: 360 and S.T. Achar, Textbook of pediatrics, 1982, 2nd ed. p. 252. ISBN-13: 978-0-86131-361-7

Amsalu S & Tigabu Z. *Risk factors for severe acute malnutrition in children under the age of five: A case-control study*. Ethiop J Health Dev. 2008; 22(1): 21-5.

Ashworth A. *Efficacy and effectiveness of community-based treatment of severe malnutrition*. Food and Nutrition Bulletin 2006; 27 (3): S20-S48

Ashworth A. *Community-Based Rehabilitation of Severely Malnourished Children: a Review of Successful Programmes*. London School of Hygiene and Tropical Medicine. Report. 2001.

Bantamen G, Belaynew W, Dube J. *Assessment of Factors Associated with Malnutrition among Under Five Years Age Children at MachakelWoreda, Northwest Ethiopia: A Case Control Study*. J Nutr Food Sci 2014; 4 (1): 256.

Bergeron G and Castleman T 2012. *Responses to Acute and Chronic Malnutrition: Divergences and Convergences*. AdvNutr March 2012 vol. 3: 242-249. <http://advances.nutrition.org/content/3/2/242.full-aff-2>

Bhan M, Bhandari N, Bahl R. *Management of the severely malnourished child: perspective from developing countries*. BMJ 2003; 326: 146-51.

Caulfield LE, de Onis M, Blossner M, Black RE. *Undernutrition as an underlying cause of child deaths associated with diarrhoea, pneumonia, malaria, and measles*. Am J Clin Nutr. 2004; 80:193-198

Dani V, Satav A, Pendharkar J, Ughade S, Jain D, Adhav A et al. *Prevalence of undernutrition in under-five tribal children of Melghat: A community based cross sectional study in Central India*, Clinical Epidemiology and Global Health 2014 Sept, 1-8

David L. *Epidemiologic Evidence for a Potentiating Effect of Malnutrition on Child Mortality*. Am J Pub Health 1993; 83(8): 1130-3.

Govt. of Maharashtra. *Human Development Indicators Among the Scheduled Tribes of Maharashtra*. A Research Report by TRTI Pune. Government of Maharashtra; 2009. pp. 25 and 27 <http://moef.nic.in/soer/state/SoE%20report%20of%20Maharashtra.pdf>.

Gragnotati M, Shekar M, Das Gupta M, Bredenkamp C and Lee YK. *India's Undernourished Children: A Call for Reform and Action*. Michele Gragnolati, Meera Shekar, Monica Das Gupta, Caryn Bredenkamp and Yi-Kyoung Lee. HNP Discussion Paper.

MAHAN Trust Report (unpublished).

Manary MJ, Ndekha MJ, Ashborn P, Maleta K, Briend A. *Home based therapy for severe malnutrition with ready-to-use food*. Arch Dis Child 2004-89: 557-561.

Meshram II, Arlappa N, Balakrishna N, Laxmaiah A, Rao MK, Reddy G et al. *Prevalence and Determinants of Undernutrition and its Trends among Pre-School Tribal Children of Maharashtra State, India*. J Trop Pediatr 2012; 58(2): 125-32.

NNMB Technical Report 25. *Diet and Nutritional Status of Tribal Population and Prevalence of Hypertension among Adults*. 2009.

Pelletier DL, Frongillo EA Jr, Schroeder DG, Habicht JP. *The effects of malnutrition on child mortality in developing countries*. Bull World Health Organ.1995;73(4):443-8.

Satav A, Sane BL, Bhapkar P, Shankarnarayan M, Parhi R, Bobde K et al. *Counsellor Program for Saving Severely Malnourished Children by Improvement of Government Hospitals of Melghat : Result of a Field Trial*. Pediatric Research (2011) 70, 828

Schoonees A, Lombard M, Musekiwa A, Nel E, Volmink J. *Ready-to-use therapeutic food for home-based treatment of severe acute malnutrition in children from six months to five years of age*. Cochrane Database Syst Rev. 2013; Jun 6

UNICEF 2005. *The State of the World's Children: Childhood under threat*. UNICEF Report [www.unicef.org/publications/files/SOWC_2005_\(English\).pdf](http://www.unicef.org/publications/files/SOWC_2005_(English).pdf)

WHO 1999. *Management of Severe Under Nutrition, A Manual for Physicians and Other Health Workers*. Geneva: WHO; 1999.

WHO 2006. *Multicentre Growth Reference Study Group. WHO Child Growth Standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development*. Geneva: World Health Organization, 2006. www.who.int/childgrowth/standards/technical_report/en/

WHO Database. *Global Database on Child Growth and Malnutrition - 'Trigger-levels' as a basis of public health decisions*. www.who.int/nutgrowthdb/about/introduction/en/index5.html.

WHO/UNICEF/WFP/SCN Joint statement. *Community-based management of severe malnutrition*. Geneva, New York, Rome, 2007. www.who.int/child_adoloescent_health/documents/pdfs/severe_acute_malnutrition_en.pdf



Global Nutrition Cluster knowledge management Process, learning and added value



Jane Howard/WFP, Turkey, 2009



Global Nutrition Cluster Case Studies

Editorial by **Jeremy Shoham,**
Carmel Dolan and Valerie Gatchell

Jeremy Shoham and Carmel Dolan are ENN Technical Directors. Valerie Gatchell was engaged as an ENN consultant to lead the cluster case study development.

The authors gratefully acknowledge Josephine Ippe, Global Nutrition Cluster Coordinator, for her review and contribution to this article.

The Global Nutrition Cluster's (GNC) core purpose is to enable country coordination mechanisms to support timely, quality, and appropriate nutrition response to emergencies. A Governance Review of the GNC in June 2013 noted the need for a more formal and systematic system for the identification, compilation and dissemination of learning from country cluster responses. Consequently, knowledge management (KM) was included as a key pillar in the GNC Strategic Plan (2014-2016) and related Work Plan¹.

As a first step, ENN supported the GNC to document six country learning focused case studies in 2015, which are summarised in this edition of Field Exchange. Five country case studies were shared at the GNC annual meeting in October 2015 and discussions confirmed the value of the process and the importance of continuing to embed KM within the GNC.

Case study development process

After a scoping exercise with the GNC-Coordination Team to identify interested countries and themes, ENN worked with Nutrition Cluster country teams in six countries (Bangladesh, Philippines, Somalia, South Sudan, Yemen, and Ukraine) to document learning around nutrition coordination.

The process in each country was different as it was largely dependent on capacity, as well as the time available in-country for documentation. In some countries, ENN conducted interviews with staff via Skype and then wrote the case study, with reviews and comments by key stakeholders (Yemen, Ukraine). In other countries, Nutrition Cluster Coordinators (NCCs) drafted case studies and worked with their Nutrition Cluster Strategic Advisory Groups to develop the learning, while ENN provided overall editorial support (Bangladesh, Somalia). Other countries developed rough drafts and ENN provided feedback and support during several iterations of document development (South Sudan, Philippines).

The GNC Coordination Team provided significant support for several countries in terms of advocating with cluster staff and country offices for continued commitment and engagement in the process and by commenting on case study drafts.

We have learned through this process that in general, although included as a small part of their job description, there is marginal time for NCCs to reflect, document and capitalise on experiences and learning.

¹ Both available at <http://nutritioncluster.net/what-we-do/>

Abridged versions of each case study are presented below.

Overall findings

There are largely two types of Nutrition Cluster identified in this review, those that are Inter-Agency Standing Committee (IASC) mandated and focus on nutrition coordination in response to an emergency (Somalia, South Sudan, Yemen, Ukraine) and those established by the IASC in response to an emergency but now continue as part of government structures (Bangladesh, Philippines).

As a sector, we seem to have a default response in emergencies: treatment of acute malnutrition, infant and young child feeding (IYCF) and a focus on children under 5 years of age. There are questions, therefore, about how the Nutrition Cluster can best support the assessment and targeting of other vulnerable groups and promote an understanding of the need to assess and address other forms of malnutrition in varying contexts. The case studies demonstrated the range of nutrition issues (anaemia, stunting, elderly person's nutrition needs and non-communicable diseases) which can be present in an emergency but are not often addressed. The GNC needs to consider how to move forward on these challenges technically and programmatically, as well as through advocacy measures.

Integration of severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) treatment programming and reporting is limited; this raises questions about how the GNC can collectively address this issue and support countries to identify the advocacy/influencing routes to a greater continuum of care for the wasted child.

Integration of nutrition across sectors is challenging in all contexts and particularly so in crises. How nutrition can be better represented in other cluster efforts in order to contribute to better nutrition outcomes, through targeting of nutrition sensitive activities such as cash and food transfers and health programming, is a work in progress but hugely valuable. As the role of cash programming in emergencies appears to be rapidly increasing, there is a need for some working guidance from the GNC to support NCCs in ensuring that these programmes maximise nutrition impact.

Engagement in preparedness and longer-term coordination mechanisms is variable and there are questions as to 'how' to do this, especially in contexts where a formal IASC activation is not needed or wanted. Furthermore, setting out the pros and cons of where to position the nutrition sub-cluster or when a stand-alone cluster is advised would be helpful.

There have been gaps in coordination capacity in several (not all) countries at national and sub-national levels, resulting in decreased coordination and lack of clarity on the role of the Cluster Lead Agency (UNICEF) in the absence of coordination staff. There appears to be intrinsic difficulties to recruit and retain suitable staff

for new emergencies. Gaps ranging from several months up to one year without an active NCC in Level 3 emergencies (the highest classification) were identified as significant constraints. This reflects difficulties around recruitment and gaps in global capacity on nutrition in emergencies (NiE). At the same time, in settings where partner technical capacity is low, NCCs can spend significant time supporting the technical side of programmes (in Bangladesh, the NCC has been heavily involved in trying to roll out community based management of acute malnutrition (CMAM), as well as preparedness activities) at the expense of coordination. Experience from Somalia and South Sudan demonstrates that having significant human resources for nutrition programming and information management allows staff to focus on coordination. There is also a challenge in providing only short-term staffing for coordination in some contexts. For example, in the Philippines, the NCC was also acting as the programme technical specialist for UNICEF but now that the funding for Typhoon Haiyan has ended, the NCC post is no longer present. The challenge here is to maintain residual NiE activities (with a focus on preparedness) in countries like Bangladesh and Philippines where emergencies are recurrent but not ever present.

Priority learning needs

Through discussion of the above points at the 2015 GNC annual meeting, there was agreement to continue to institutionalise learning at the country cluster level. Eleven priority areas for documentation of learning were highlighted, including:

1. Situational analysis and response planning when GAM is low

2. Assessment and nutrition programming for other populations (adults and pregnancy and lactating women)
3. How to effectively link MAM and SAM management
4. Nutrition sensitive cash programming
5. How to respond to a non-breastfed population - experiences with breast-milk substitutes
6. Experiences of integrating nutrition into other sectors (food security; health; and water, sanitation and hygiene)
7. Transition planning and process with the Ministry of Health
8. Preparedness and systems building
9. Impact of coordination on improving emergency response
10. How Nutrition Clusters adapt to long-term chronic emergency
11. Nutrition in urban areas

In conclusion, through these case studies, the GNC now has a strong body of documentation on a range of coordination challenges, e.g. South Sudan information management; Somalia programme rationalisation in a highly complex and political emergency; and the context challenges to the normal modus operandi of the nutrition cluster, e.g. Bangladesh, Ukraine and Turkey (ENN, 2015), which could be utilised to support guidance or learning tools. The GNC KM work demonstrates the potential value of detailed case studies and the commitment of NCCs and other actors to document their learning.

References

- ENN (2015). *Coordinating the response to the Syria Crisis: the southern Turkey cross border experience*. Field Exchange 48, November 2014. p138. www.ennonline.net/fex/48/coordinating



The needs of older people are not adequately considered in nutrition cluster response. This 77 years old man receives food vouchers to augment his pension; he was injured and his family killed by shelling in the Ukraine.



Yemen

Scaling up nutrition services and maintaining service during conflict in Yemen

Lessons from the Hodeidah sub-national Nutrition Cluster

By Dr. Saja Abdullah, Dr. Rasha Al Ardi, and Dr. Rajia Sharhan



Dr. Saja Abdullah is Chief of Nutrition with UNICEF Yemen



Dr. Rasha Al Ardi is Health and Nutrition Office and Sub-cluster Coordinator for Hodaida zonal office, Yemen.

Dr. Rajia Sharhan is a Nutrition Specialist with UNICEF (formerly based in Yemen). She has worked in the CMAM programme in Yemen for 10 years, working to scale up nationwide from 2006 up to 2015.

The ENN team supporting this work comprised Valerie Gatchell (ENN consultant and project lead), with support from Carmel Dolan and Jeremy Shoham (ENN Technical Directors). Josephine Ippe, Global Nutrition Cluster Coordinator, also provided support.

This article is a summary of a case study produced in a collaboration between ENN and the Global Nutrition Cluster (GNC). The full case study is available at www.ennonline.net/ourwork/networks/gnckm.

The findings and recommendations documented in this case study are those of the authors. They do not necessarily represent the views of UNICEF, its Executive Directors or the countries that they represent and should not be attributed to them.



WFP/Amnar Bamatzaf

Location: *Yemen*

What we know: Yemen is the poorest Arab nation, embroiled in lengthy political crisis and ongoing conflict. Malnutrition is a major and chronic problem; international humanitarian access is compromised.

What this article adds: The Nutrition Cluster was established in the Yemen in 2009, co-led by the Ministry of Public Health and Population and UNICEF. There are five sub-national clusters. Through 2012-14, scale up of nutrition services (SAM and MAM treatment, IYCF, micronutrient supplementation, strengthened reporting), combined with multi-sectoral interventions led to an improved nutrition situation in Hodeidah governate. The majority of programming has been government led; local NGOs have been an integral part of the provision of health and nutrition service delivery. Ongoing challenges include poor integration of SAM/MAM services, failure to address prevalent stunting, funding gaps and escalating conflict compromising service delivery and access further. The SUN Movement multi-sector plan, finalised and pending implementation, offers an opportunity to connect emergency and development programming.

Country overview

Yemen is the poorest Arab nation, characterised by high unemployment (40%, geopoliticalmonitor.com), rapid population growth (45% of the population are below the age of 15) and diminishing water resources. The economy, heavily dependent on dwindling oil supplies (expected to end by 2017), has been severely disrupted by a lengthy political crisis and conflicts on several fronts spanning a number of years. Fighting escalated in March 2015, exacerbating an already severe humanitarian crisis with large scale population displacement, destroyed civilian structures, including hospitals and schools, and near collapse of basic services. There are widespread fuel shortages (reducing export earnings) and extremely limited access to water in many areas.

Health, nutrition and food security

An estimated 8.4 million people lack access to basic healthcare and maternal mortality is high. An estimated 13.4 million people lack access to safe drinking water and 12 million people have no proper sanitation facilities (UN OCHA, 2015). Malnutrition is a major and chronic problem in Yemen. Stunting is prevalent (47% in 2011; IFPRI, 2014); acute malnutrition is estimated nationally at 16% (DHS 2014), although there are areas where this is significantly higher. Yemen suffers from the double burden of malnutrition; 46% of adults are overweight and 17% are obese (WHO, 2008). Anaemia affects 38% of women

of reproductive age and 27% of school-aged children are vitamin A deficient (IFPRI, 2014). While breastfeeding is common in Yemen (97% of all women breastfed), infant and young child feeding (IYCF) practices are characterised by low timely breastfeeding initiation rates (40%) (MICS, 2006), very low exclusive breastfeeding rates (12%) (UNICEF 2003), and a high level use of feeding bottles (42% use in 0-3 months, Yemen Family Health Survey, 2003).

Nearly half (46%) of the population (12 million people) are food insecure (WFP Sit Rep #8, 28 May 2015). Almost all food (90%) is imported and prices have increased due to disruption in food supply routes and sporadic transportation services. Meanwhile, household incomes have decreased due to the devaluation of the local currency.

The Nutrition Cluster

The Nutrition Cluster (NC) was established in August 2009 following a large-scale Yemeni military response to the Houthi rebels in Sa'ada, northern Yemen. The NC is co-led by the Ministry of Public Health and Population

¹ International NGOs: International Medical Corps, Action Contra La Faim, Save the Children International, Mercy Corps. Local NGOs: Charitable Society for Social Welfare (CSSW), Soul Yemen. UN agencies (WFP, WHO, UNICEF) and the International Organisation on Migration.

(MoPHP) and UNICEF at both national and sub-national levels. A steering committee comprised of both international and local NGOs¹ identifies key strategic areas of focus for the work plan and reviews progress of response and emerging priorities. At national level, there are 35 active partners, approximately 25% of which are local NGOs (LNGOs). At sub-national level, local NGOs often make up a higher percentage of partners. An Information Management officer (IMO) supports both national and sub-national clusters. An Assessment Officer coordinates nutrition assessments for the cluster. There are five sub-national nutrition clusters at governorate (state) level. These are led by the UNICEF programme officer and supported by UNICEF IMOs (who support UNICEF programmes and all the UNICEF-supported clusters simultaneously). The NC is the only coordination mechanism for nutrition response in emergencies in Yemen, although under the Scaling Up Nutrition (SUN) movement, there is an ongoing initiative to establish a development-orientated food security and nutrition coordination platform.

Hodeidah and Hajjah Sub-Cluster Response 2012-2014

UNICEF has been involved in supporting health and nutrition activities in Hodeidah and Hajjah

governorates since the 1990s, with specific support to vaccinations and Integrated Management of Childhood Illness (IMCI), community-based nutrition activities (2000) and a community-based, maternal, neonatal care programme was started in 2007. In 2008, UNICEF started community management of severe acute malnutrition (SAM) programming in Hajjah and in 2009 in Hodeidah. In 2011, the SAM caseload increased and with anecdotal evidence of deteriorating nutrition, UNICEF conducted SMART surveys in November 2011 in Hodeidah and in May 2012 in Hajjah. The surveys revealed that acute malnutrition was high in both Hodeidah (global acute malnutrition (GAM) 31.7% and SAM 9.1%) and Hajjah (GAM 19.8% and SAM 3.7%). High levels of GAM and SAM were most likely due to a long-term, gradual increase in a number of risk factors (long-term food insecurity, sporadic conflict, poor IYCF practices, and limited access to quality health care).

In response, high-priority districts, potential partners and capacity gaps for local non-governmental organisations (LNGOs) were identified collaboratively with the cluster partners and the government. Partners responded quickly to the needs in Hodeidah; however there was less partner interest in Hajjah, largely due to their limited

capacity to expand operations. Sub-national clusters were established for each governorate.

Response – national level

In 2012, the National Nutrition Cluster (NNC) developed a costed, integrated, strategic response plan (SRP) for nutrition to massively scale up services to treat acute malnutrition and prevent undernutrition in Hodeidah and Hajjah and other governorates of Yemen. This plan was used at a national and international level to advocate for funding for nutrition and for a multi-sectoral response to the nutrition situation. The NNC also actively engaged in the Scaling Up Nutrition (SUN) Movement (see Box 1).

Response – Hodeidah and Hajjah governorates

The following nutrition activities were undertaken in Hodeidah and Hajjah:

- **Therapeutic Feeding Centres (TFC) or Stabilisation Centres (SC)** – at district level to provide inpatient care (as per WHO protocols) for severely acutely malnourished children (under five years) with complications. Training on inpatient care was provided to Health Facility (HF) staff.
- **Outpatient Therapeutic Care (OTP)** – at HF level (fixed and mobile teams) to treat children (under five years) with uncomplicated SAM. Children were provided with ready-to-use therapeutic food (RUTF), as per the Yemen National CMAM Guidelines. Training on outpatient care was provided to HF and mobile team staff.
- **Treatment of Moderate Acute Malnutrition (MAM)** – at HF level and within mobile teams, alongside outpatient therapeutic care. Ready-to-use Supplementary Food (RUSF) was provided to moderately acutely malnourished children (under five years).
- **Integration of IYCF activities** – including IYCF ‘corners’ in HF and training of community health volunteers (CHVs) on IYCF-best practice. IYCF messages were also integrated into UNICEF-supported Community Development activities.
- **Micronutrient supplementation** – including vitamin A supplementation and de-worming (for children under five), iron/folic acid supplementation for pregnant and lactating women, and multiple micro-nutrient powders for internally displaced persons.
- **Community mobilisation** – activities included training community health volunteers on screening for acute malnutrition through the measurement of mid-upper arm circumference (MUAC). Additionally CHVs were trained on communication and counselling around infant and young child feeding.

Approximately 20% of programming was taken on by NGOs and 80% by government. The Government Health Office (HO) took on the responsibility for increasing and scaling up treatment of SAM and MAM in fixed HF (with UNICEF support for supplies). Local and international NGO partners agreed to fill capacity

Box 1 The SUN movement in Yemen and links with the Nutrition Cluster

The Government of Yemen joined the SUN movement in November 2012 and appointed the Minister of MoPIC as the SUN focal point. In April 2013 the MoPHP presented the nutrition situation of women and children in Yemen to the cabinet. Following this the Prime Minister advised key ministries to develop an integrated, multi-sectoral response plan to address the nutrition situation and establish a technical consultation platform to support it. The MoPIC was assigned responsibility for convening and coordinating the movement and its steering committee by a government decree.

The SUN steering committee convenes a regular monthly meeting, chaired by the SUN focal point. The committee is comprised of key ministries (including MoPHP, Education, Agriculture, Fisheries, Water & Environment and Communication), UN organisations (UNICEF, WFP, WHO, UNDP and FAO), donors

(UK AID, USAID, WB, EU), academia (University of Sana'a), the private sector (chamber of commerce representative) and civil society organisations. A SUN technical committee also meets regularly; the national-level NCC actively participates in this forum.

Under the SUN framework, finalisation and costing (USD \$1.2 billion) of the five-year, national, multi-sectoral nutrition plan (MSNAP) together with the Ministries of Health, Water, Agriculture, Fisheries and Education has been concluded. The Nutrition Cluster was heavily engaged in this process and as a result the MSNAP includes costed interventions for emergency preparedness and response in addition to longer-term, developmental nutrition actions.

The aim was to introduce the plan into the 2015 government planning and budget cycle, but due to intensified conflict and the shifting political context it is currently ‘on hold’.



and training gaps in temporary HFs, and establish mobile teams to access areas without services and support community mobilisation. WFP provided supplies to NGOs and the HO for treatment of MAM.

Capacity development of HF staff was required to expand CMAM activities, which included training all HW in fixed or temporary HF on CMAM protocols by the HO (with UNICEF support); technical support from international NGOs to HW working in temporary sites; and mobile teams established by international NGOs to access areas with no HF.

LNGOs have been a significant part of the provision of health and nutrition service delivery since 2011 and have been critical for the response post-2015 due to the evacuation of international NGOs. As of mid-2015, eight LNGOs were working in Hodeidah and Hajjah. The Charitable Society for Social Welfare (CSSW) and the Yemen Family Care Association (YFCA) are national and sub-national Nutrition Cluster partners; others are partners only at the sub-cluster level.

Given its extreme levels of SAM, treatment was prioritised in Hodeidah, while there was a stronger push for prevention activities in Hajjah.

Results

During the response, the number of cluster partners increased from three to 21 partners from 2012 to 2014 in Hodeidah and Hajjah. The scale up in nutrition service provision is reflected in the following results:

- **OTP service:** In Hodeidah, the OTP was expanded from 52 sites (end 2011) to 353

(early 2014), covering 94% of all fixed and temporary health facilities. In Hajjah, OTP sites increased from 82 sites (early 2012) to 177 (in 2014), representing 72% of all HF in Hajjah (fixed and temporary).

- **Coverage of SAM treatment:** Coverage surveys (Semi Quantitative Evaluation of Access and Coverage (SQUEAC)) were conducted in two districts in Hodeidah and two districts in Hajjah from 2013 to 2014, reporting point coverage of 49-64%. On average, this is above SPHERE standard for rural areas and has caused other governorates to adopt the CMAM model.
- **Integrated services:** Integration of inpatient TFCs and SCs into district-level HF increased from one (2011) to 10 (2014) in Hodeidah, while in Hajjah, the number increased from two in 2012 to three in 2014.
- **MAM treatment:** Supplementary feeding for children with MAM and pregnant and lactating mothers was increased in Hodeidah from four (early 2012) to 274 (end 2014) HF. In Hajjah, it increased from 11 (2012) to 121 (2014) HF providing services for MAM.
- **Mobile teams:** Mobile teams implementing integrated health and nutrition services increased from zero (2011) to 23 (2014) in Hodeidah and from three to 12 in Hajjah in the same time period.
- **Staff capacity development:** Community mobilisation efforts resulted in an increase in community health volunteers (CHVs) trained in nutrition from zero (2012) to 2297 (2014), increasing further to 1551 (2014) for Hajjah. Additionally, a total of

1,645 community leaders were sensitised in both Hodeidah and Hajjah.

- **SAM enrolment and outcomes:** In Hodeidah, SAM enrolment increased from 8,878 (2012) to 21,026 (2014). Cure rates, initially 41% (2012), increased to 70% by 2014, while default rates decreased from 54% (2012) to 26% (2014). In Hajjah, SAM enrolment increased from 3,748 (2012) to 10,216 (2014). Cure rates increased from 61% (2012) to 81% (2014) and default rates decreased from 35% (2012) to 15% (2014).
- **IYCF:** The number of breastfeeding corners in health facilities increased from zero (2012) to 60 (2014) in Hodeidah and from one to 34 in Hajjah during the same period.
- **Monitoring:** From 2010 to 2012, only 25% of OTPs delivered HO monthly reports on time in Hodeidah and Hajjah, many of which were incomplete. Additionally, 10% of OTPs had supply stock-outs due to irregular monitoring and unclear supply mechanisms. To address this, in 2013 UNICEF funded monitoring training and support (transport money, daily allowance) for 26 district and six zonal monitors in Hodeidah and 31 district and six zonal monitors in Hajjah. By early 2013, 90% of HF monthly reports were received on time and there was significant improvement in stock-outs as observed by the HO and UNICEF.

SMART surveys were conducted again in both Hodeidah (March 2014) and Hajjah (May 2014) (see Table 1). The improvement in the nutrition situation in Hodeidah is attributed to the high coverage of nutrition interventions (64% in Jabal Ras district, May 2014), complemented by a range of multi-sectoral interventions. Absence of multi-sector interventions (lack of partner capacity) and the lower coverage of nutrition interventions explain less progress in Hajjah (49% in Aslem district, May 2014).

Challenges from the 2012-2014 response

Integrated treatment and reporting of SAM and MAM

With different UN agencies providing support for SAM and MAM treatment, there was not always geographic overlap in service provision as UNICEF and WFP prioritise districts differently. WFP has expanded its target area based on advocacy from the nutrition sub-cluster, with ongoing cluster advocacy for further WFP expansion into UNICEF SAM treatment areas. Additionally, different reporting structures for treatment of MAM and SAM are used, with UNICEF providing support to district and zonal monitors and WFP providing support only at the governorate level. District-level monitoring has supported the development of a strong reporting system for SAM; reporting for MAM is less timely, specific and reliable.

Addressing stunting and prevention as part of emergency response

It was recognised that stunting was a problem in the situational analysis prior to 2012. The

Box 2 Experience with mobile teams (MTs)

In 2012, the HO alongside the nutrition sub-cluster identified several areas of Hodeidah and Hajjah with no health and nutrition services. Partners agreed with MTs to provide outpatient treatment for SAM and MAM (where possible with WFP supplies/support), Integrated Management of Childhood Illness (IMCI) services, vaccinations, reproductive health services, vitamin A supplementation and IYCF counselling. Once no new cases of SAM are identified, all current cases are referred to the nearest HF to complete treatment.

NGOs supported the development of 23 mobile teams (from 2012 to end 2014) to cover vulnerable districts of Hodeidah. In Hajjah, six local and international NGOs implemented mobile teams, but gaps in coverage remained. In response, the Hajjah HO developed mobile teams, building capacity of district-level health workers on mobile and key health services, and renting vehicles.

As a result, coverage of health services dramatically increased. In 2011, 1,345 children under five with SAM were enrolled from 32 districts (all of Hajjah) with a 12%

cure rate. Hajjah HO MTs were launched in 2012 in three districts. By the end of the year, 1,690 SAM children under five years were enrolled (67% cure rate, 28.7% default rate). In 2013, 1,925 SAM children under five years with SAM (92% cure rate, 7% default rate). The HO mobile team had the highest performance indicators of all implementing partners. Vaccination coverage of children under one year of age dramatically increased, from 13% (2014) to 100% in six targeted districts.

The cost for an HO-implemented mobile team (US\$3,000) proved much less than that of an NGO team (US\$5,000-7000) with added value in building capacity of government health services.

Advocacy efforts by the HO and nutrition sub-cluster has meant WFP will provide MAM treatment supplies for all MTs from 2015. By the end of 2014, the HO (with UNICEF support including vehicle rental and health worker daily fees) was supporting nine mobile teams. Plans for expansion are on hold due to increased insecurity but mobile services have continued and reacted to displaced population needs.

Table 1 Prevalence of nutrition in Hodeidah and Hajjah since 2011^a

	Hodeidah		Hajjah lowlands		Hajjah highlands	
	2011 SMART survey (November)	2014 SMART survey (March)	2012 SMART survey (May)	2014 SMART survey (May)	2011 SMART survey (December)	2014 SMART survey (March)
Global Acute Malnutrition	31.7%	18%	19.8%	18%	9.3%	9.2%
Severe Acute Malnutrition	9.9%	3%	3.7%	2.9%	0.9%	1%
Underweight	59.6%	50%	46.2%*	40.4%*		
Stunting	55%	63.5% (53.8% lowlands)	55%**	44.1%**	66%**	53.2%**

^aAll survey results are available at sites.google.com/site/yemennutritioncluster/documents/nutrition-survey-reports

*These surveys included both lowlands and highlands as data were not disaggregated.

** The difference in the prevalence of stunting from 2011/2012 to 2014 decreased but not statistically ($P < 0.005$).

2012–2014 SRP, whilst focused on CMAM scale up, included a community component (IYCF and peripheral health centre (PHC) interventions) to address the underlying causes of undernutrition. The community component was expanding with time, but increased insecurity has limited roll-out.

Funding

Lack of funds for the nutrition response in general remains a challenge and has resulted in areas with limited or no nutrition services.

2015 conflict

International NGOs pulled international staff out of Yemen in April 2015. The current crisis has affected all governorates more directly than in 2011–2014; currently three districts in Hajjah are experiencing intense fighting and all HF have closed down indefinitely. HFs in Hodeidah generally remain open, although access is security-dependent. In response to the escalation of conflict, the nutrition sub-cluster has shifted from development-orientation to a focus on emergency response. This is modelled on the 2012–2014 response across 23 sub-governorates, with increased use of MTs.

On-going operational challenges in 2015 include:

- A lack of clear figures of IDPs due to on going insecurity and related continual movement.
- Shortage of fuel has negatively impacted transport, delivery of supplies and implementation of mobile teams. In collaboration with other clusters, the Nutrition Cluster has advocated for and accessed alternative sources of fuel, including stock from private companies, government authorities, existing partners, the black market and renting vehicles already fuelled. UNICEF has procured additional RUTF supplies from Djibouti, delivered directly to Hodeidah by boat (all main airports destroyed in early 2015).
- Ongoing conflict has constrained access to affected and vulnerable communities. The conflict situation and supplies are monitored daily by HF staff, communicated

to the HO by mobile phone and reports are hand-carried to the HO.

- Communications are largely conducted by mobile phone; coverage is limited in some areas. Electricity to charge mobile phones is also often scarce. Internet services are still available in Hodeidah and Hajjah but sporadic.
- Evacuation of international staff in April has meant remote management by international staff, resulting in delayed decision-making and reporting. LNGOs (30% of nutrition cluster partners in Hodeidah and Hajjah) have been involved in the response since 2012 and continue to play a critical role in service delivery, based on their expertise and capacity.

Learning

Yemen is a complex and challenging country that has achieved significant scale-up of nutrition services, particularly in treating acute malnutrition, despite increasing conflict and limited access. The following points of learning from this experience have been identified:

- **Importance of local NGOs in service delivery.** As has been shown in Yemen, international NGOs often have limited access in a crisis, with local NGOs able to provide more frontline and continuity of response. Mapping of, and investment in, LNGOs capacity is critical from the outset to support and sustain implementation, and eventual transition of cluster activities.
- **Importance of building local government capacity.** While it can be challenging to build local government capacity, long-term impact can be significant. In the Yemen, successful government-led interventions have included the development of a cost-efficient mobile service delivery, and seen improved reporting and supplies management. Building capacity of local government in logistics and transport can facilitate future transition of services (and implementation in insecure areas).
- **Integration of treatment and reporting for SAM and MAM.** Geographic integration of

MAM and SAM services remains low (25%), presenting a huge challenge for service delivery. While joint planning was conducted, shortage of funding (WFP) and different geographic areas of priority between UNICEF and WFP limit service overlap. Advocacy is required at all levels to ensure integration of service delivery, even if this means a 'one agency/one programme approach'. Standardised reporting of both SAM and MAM programmes is useful and has been achieved through open discussion and flexibility of partners.

- **Addressing stunting through prevention initiatives as part of emergency response.** The high-stunting context of Yemen was recognised, but has not led to programming to directly address the problem. The high level of stunting in spite of decreased wasting in Hodeidah highlights the challenge of treating and preventing stunting in this kind of complex emergency.
- **Multi-sectoral programming.** The multi-sectoral response in Hodeidah contributed to significant improvement in the nutrition situation, enabled by a strong National Nutrition Cluster Coordinator, continued advocacy across sectors at national and governorate level, and partner capacity.
- **Engagement in the SUN Movement.** NC engagement in the SUN movement is critical to ensure that emergency preparedness and response is part of the national multi-sectoral plan. This engagement should be institutionalised within the NC at national level. Additionally, it is apparent that intense conflict and political unrest can slow down progression of SUN processes, as evidenced by the lack of movement in endorsing SUN budget lines within the national budget.

Conclusions

Nutrition coordination in Yemen remains challenging, given the continued violence and insecurity that are restricting movement and programming. However, local government and agency staff are committed and working hard to implement nutrition services where security permits. The SUN multi-sector plan that covers both emergency preparedness and development initiatives offers a key platform around which to collaborate on improving nutrition outcomes for the people of Yemen.

For more information, contact:

Dr. Saja Abdulla, email: sabdullah@unicef.org

Dr. Rasha, email: ralardi@unicef.org

Dr. Rajia Sharhan, email: rsharhan@unicef.org

References

IFPRI, 2014. *2014 Global Nutrition Report: Actions and Accountability to Accelerate the World's Progress on Nutrition*. International Food Policy Research Institute 2014, Washington DC.

UN OCHA 2015. *Yemen Humanitarian Needs Overview, 2015 (Revised)*. UN Office for the Coordination of Humanitarian Affairs. June 2015. www.humanitarianresponse.info/en/operations/yemen/document/yemen-humanitarian-needs-overview-2015-revised



Philippines

Philippines Nutrition Cluster

Lessons learnt from the response to Typhoon Haiyan (Yolanda)

By Aashima Garg, Andrew Rene Bucu and Rene Gerald Garela

Aashima Garg is Nutrition Specialist based in UNICEF New York. At the time of writing, she was Nutrition Manager with UNICEF Philippines leading the nutrition emergency and regular programmes. She has over 11 years of experience in the area of Public health Nutrition programming across South Asia.

Andrew Bucu, MD, MPH is a SAM Management Scale Up Consultant, engaged by UNICEF Philippines.

Rene Galera MD, MPH is a Nutrition Specialist with UNICEF Philippines.

The ENN team supporting this work comprised Valerie Gatchell (ENN consultant and project lead), with support from Carmel Dolan and Jeremy Shoham (ENN Technical Directors). Josephine Ippe, Global Nutrition Cluster Coordinator, also provided support.

The authors would like to acknowledge the following Government colleagues working in the National Nutrition Council, Department of Health who contributed to the document: Asec. Maria-Bernardita T. Flores, CESO II, Assistant Secretary of Health and Executive Director/Chair of the National Nutrition Cluster; Maria Lourdes A. Vega, Chief of the Nutrition Policy and Planning Division; Margarita D.C. Enriquez, Nutrition Officer II/IMO and Secretariat of the National Nutrition Cluster.

This article is a summary of a case study produced in a 2015 collaboration between ENN and the Global Nutrition Cluster (GNC). The full case study is available at www.enonline.net/ourwork/networks/gnckm.

The documented findings and recommendations are those of the authors. They do not necessarily represent the views of UNICEF, its Executive Directors or the countries that they represent and should not be attributed to them.

©UNICEF Philippines/2014



A dredging ship, carried inland by the Typhoon Haiyan, being used as a temporary shelter by more than 20 families

Location: *The Philippines*

What we know: The Philippines is a middle-income country vulnerable to a wide range of natural hazards, such as cyclones, earthquakes and volcano eruptions.

What this article adds: In 2013, Typhoon Haiyan hit the Philippines causing huge devastation and population displacement. The existing government-led Nutrition Cluster (NC) sought international support in the response. Informed by 2011 data, the Strategic Response Plan initially focused on SAM treatment, IYCF support and preventing donations of BMS with some micronutrient and complementary feeding provisions. Targets and scope was subsequently revised based on more current data, focusing on health system strengthening, expansion in IYCF support and capacity building (IYCF, CMAM, nutrition in emergencies). Challenges included lack of government capacity on coordination in the early response; over-focus on CMAM amongst agencies contributed to by lack of preventive programme experience; gaps, lack of capacity and inconsistencies in information management systems; dominance of breastfeeding support in IYCF response to the detriment of complementary feeding; and poor identification and needs provision for non-breastfed infants. Actions to improve future responses emphasise preparedness and include capacity mapping and capacity development, pre-positioning IM tools and systems; and plan for transitioning early in the response with emphasis on building existing systems and government capacity. Identified gaps include guidance on how to operationalise an emergency response that considers stunting and how to manage non-breastfed infants in an emergency. Whilst gaps were identified, post-Typhoon, the Philippines is now stronger government capacity, availability of guidelines and policies for nutrition.

Country overview

The Philippines is a middle-income country vulnerable to a wide range of natural hazards. It is affected by 20 cyclones a year on average and experiences frequent earthquakes and eruptions from 23 active volcanoes. On November 8 2013, Typhoon Haiyan (nationally known as Typhoon Yolanda) swept through central Philippines and was recorded as the strongest typhoon in the world. The damage to life and property was overwhelming, displacing 4.1 million individuals, including 1.7 million children¹. Three regions in the country were directly hit: a number of provinces in Regions VI and VII (Western and Central

Visayas) were devastated, while Region VIII (Eastern Visayas) suffered the brunt of the damage, prompting the government to declare a state of calamity. In the wake of the devastation, the government requested international support to coordinate and implement the response.

Nutrition response to Typhoon Haiyan

Cluster leadership and governance

The government of the Philippines officially adopted the cluster approach in 2007 after an international response to Typhoon Durian

¹ Nutrition Cluster SRP for Typhoon Haiyan, November 2013.

(locally named Reming). Since then, sectoral coordination mechanisms, with a mandate to address both emergency response and preparedness, have been permanently integrated into government departments. These mechanisms are referred to nationally as 'clusters', although they are never deactivated. They focus on preparedness in normal times and respond to all emergencies when they hit. In response to large-scale emergencies where international assistance is requested, the 'clusters' receive international support (funding and human resources) through United Nations (UN) partners.

At the time Haiyan struck in late 2013, the National Nutrition Council (NNC) was still familiarising itself with its new role as government lead of the Nutrition Cluster (NC); it had limited experience and capacity to lead and manage the response. There was no focal unit in the NNC for emergencies and the internal coordination mechanisms, roles and responsibilities had yet to be clarified. UNICEF suggested that it co-lead to support coordination and technical assistance until the NNC was able to assume a full leadership role. Sub-national nutrition clusters were activated for coordination in the Haiyan-affected regions in Tacloban (Region VIII), Cebu (Region VII) and Roxas (Region VI) cities. The sub-national NCs in Regions VI and VIII followed the same arrangement as the NC and were led by sub-national NNC with UNICEF in a co-lead role. However in Region VII, after initial coordination support from UNICEF, the NNC led the sub-regional cluster for most of the response phase with technical support from UNICEF as required/requested.

Nutrition situation assessment and initial response to Haiyan

When Haiyan struck, acute malnutrition prevalence was 8% and stunting was 30% nationally, with regional variation. Exclusive breastfeeding prevalence rate (34%) and minimum dietary diversity (15% in children aged 6-24 months) were low and anaemia prevalence was high, affecting 39% of infants (6-12 months) and 25% of pregnant women. A review of secondary data on the nutrition situation prior to Haiyan was conducted to inform the development of the Strategic Response Plan (SRP). The most recent data was from the National Nutrition Survey (NNS 2011) which indicated the following:

- Wasting in children under 7.8% to 8.5% across affected areas
- Exclusive breastfeeding rates of 50 to 70% across affected areas
- Malnourished lactating women (10%) and pregnant women at risk of malnutrition (16 -33%)
- Widespread distribution of breastmilk substitutes (BMS).

At the time the SRP was developed, updated nutrition data was not available as the results of the 2013 National Nutrition Survey had not been released. It was perceived that acute malnutrition would increase due to the crisis. Partners working in the Philippines at this time had experience with Community based Management

of Acute Malnutrition (CMAM), due to the largely CMAM-based response to the emergency in Mindanao in 2009. The SRP developed in December 2013 therefore focused on:

- Treatment of acute malnutrition for children and pregnant and lactating women
- Infant and young child feeding (IYCF) support (with a focus on support to breastfeeding mothers and caregivers of children 0-23 months)
- Monitoring BMS donations.

Limited activities on the following were also included in the SRP:

- Micronutrient supplementation for children (vitamin A) and pregnant women (iron and folic acid)
- Treatment of moderate acute malnutrition (six-month supplementary feeding programme supported by the UN World Food Programme (WFP))
- Distribution of micronutrient powders (MNPs) (short-term distribution by WFP of UNICEF supplies).

While IYCF counselling and complementary feeding were mentioned in the SRP, corresponding activities were not included in the partners' funding agreements with UNICEF (Programme Cooperation Agreements (PCAs)), nor were the indicators included in the SRP to monitor and measure support to complementary feeding promotion activities.

Revised nutrition response

SMART surveys conducted in February 2014 (three months post-Haiyan) indicated that both global acute malnutrition (GAM) and severe acute malnutrition (SAM) among children 6-9 months old were low (4.1% and 0.3% respectively), but confirmed that stunting was high (30.6%). Based on these figures, it was clear that the original SRP overestimated the burden of acute malnutrition. Thus in May 2014, the SRP was realigned. Targets were recalculated, resulting in a decrease from 6,000 to 800 children with SAM to be treated, and the response was expanded to encompass a more comprehensive approach of managing SAM while preventing stunting. The aim was to increase and expand IYCF activities (improved complementary feeding with micronutrient powder supplementation and skilled counselling); capacity building (for IYCF, CMAM and nutrition in emergencies (NiE)); and strengthening of health systems (creation/ revitalisation of local nutrition committees to oversee all nutrition action in the local government units).

All seven local and international implementing partners supporting the nutrition response were receiving funding from UNICEF through PCAs. UNICEF reviewed and revised the PCAs with partners to adjust target numbers and shift focus of implementation and corresponding activities. Excess stock of ready-to-use therapeutic food (RUTF) (due to initial expectations of high case-load) was reallocated to other areas in the country with ongoing emergencies (Zamboanga City and Cotabato City).

Key challenges to the initial analysis and programme response were:

- Limited government capacity for coordination due to the recent shift in leadership of the NC
- High turnover of the NCC position at the outset of the response
- Situational analysis leading into the SRP did not reflect the breadth or scale of nutrition challenges (i.e. stunting and micronutrient deficiencies)
- Focus of partners on CMAM
 - Agencies were slow to shift away from CMAM due largely to their lack of experience and capacity in preventative nutrition programming
 - Closed partner selection processes by UNICEF created tension among cluster, government and partner staff
- Supplementary Feeding Programmes (SFPs) were ended after six months (due to WFP funding constraints) with no gradual phase-out
- Large number of BMS donations and lack of understanding of communities and partner staff on how to report violations of the International Code of Marketing of Breastmilk Substitutes (the Code)
- IYCF-specific challenges included:
 - Lack of national guidance on IYCF in emergencies (IYCF-E) generally beyond breastfeeding support and lack of international guidance on how to manage non-breastfed infants
 - Lack of a reporting mechanism for the identification, monitoring and reporting on non-breastfeeding mothers
 - No reliable reporting system in place for community health and nutrition workers and counsellors to track progress in counselling of breastfeeding mothers
 - Lack of skilled staff support on IYCF counselling in affected communities
 - Large focus on support to breastfeeding at the cost of provision of support to complementary feeding.

Information Management (IM)

At the time of the Haiyan response, multiple health management information systems (HMIS) were already in place and only two nutrition indicators (exclusive breastfeeding rate and vitamin A supplementation) were included in one of the systems. While other indicators, including timely initiation of complementary feeding, multiple micronutrient supplementation and iron-folic acid supplementation were included, they were not being reported.

To strengthen IM, crucial to a quick and timely response, external support was provided by UNICEF through the deployment of three IM officers (IMOs) (one national, two regional) a few weeks after Haiyan hit until mid-late 2014. IMOs worked with government and partner staff to organise a reporting system and website for the cluster as no common pre-crisis reporting system was in place and different indicators were being used to assess undernutrition in different areas. Information in the reporting



The destruction caused by Super Typhoon Haiyan (local name Yolanda) in the city of Tacloban, Leyte, Philippines

system included results of activities conducted by government and non-governmental organisation (NGO) partners on IYCF, CMAM and micronutrient supplementation programmes. The system supported regular cluster reporting such as bulletins and situation reports through email and the website.

Challenges to the IM in response to Haiyan included:

Reporting: Various forms existed at sub-national level for nutrition data collection and the full range of indicators outlined in the NC monitoring and evaluation plan and SRP was not included in any one form. In many areas during the early response, forms were not available to cluster partners and transmission of data was sporadic and unreliable (due to poor communication lines and long power cuts) when frequent reporting updates were expected. For some indicators (i.e. MNPs), data were received from inappropriate proxy locations (site distribution) rather than Rural Health Unit (RHU) or household-level recording/reporting.

Limited capacity building: While the IM officers worked alongside local staff, there were limited mentoring opportunities to support knowledge transfer to the local staff.

No existing system within which to build or integrate: While there was interest and buy-in from the government on IM, there was no existing surveillance system to build or integrate IM systems into and there was lack of clarity on who would collect what data at community level.

Limited local systems/structure for IM: Strengthening of local IM capacities was identified as an urgent need by the NNC during the response. While there were plans to build local IM capacities, at the time, there was no nutrition-specific IM training package endorsed by the Global Nutrition Cluster (GNC) or the NNC.

Capacity building for nutrition programme response

Lack of available experienced and competent implementing partners has been a recurring constraint in emergencies in the Philippines, including the Zamboanga City siege (September 2013), the Bohol earthquake (October 2013)

and the protracted Autonomous Region of Muslim Mindanao (ARMM) conflict (started 2009). At the time Haiyan hit, UNICEF and partner NGOs were already responding to these other emergencies, which limited their capacity to support areas affected by Haiyan. The limited capacity on the ground for programming in nutrition highlighted the need for capacity building during the Haiyan response.

To this aim, UNICEF conducted a 'training of trainers' with partners and provided funding and technical support (an IYCF-E consultant) to partners to further train local health workers to strengthen the capacities of service providers at provincial and municipal level in the delivery of quality nutrition services. UNICEF also conducted cluster coordination training in July 2014 to build the capacity of NNC staff and Nutrition Programme Coordinators at sub-national level in coordination. Additionally, UNICEF provided technical support to NNC's Surveillance Division to build capacities on how to conduct and manage SMART surveys.

Challenges to capacity building

Long-term development activities for nutrition were included in the National Nutrition Plan but implementation was variable across the regions and did not always correspond to quality nutrition service delivery (pre-Haiyan). Haiyan highlighted gaps in non-emergency nutrition service delivery and emergency preparedness for nutrition. While a training package to orient and train community workers on nutrition in emergencies had been adopted nationally, it had not been rolled out at the time of the response. Several partners were unaware of this, which resulted in overlap in the content of trainings run by partners. While there were plans at sub-national level for capacity development activities, there was no overarching capacity development action plan at national level. While a capacity mapping exercise was conducted, the resulting database did not include government nutrition response preparedness capacities. In an effort to complete activities before the funds expired, implementing partners often ran simultaneous trainings, which resulted in a competition for participants and significant absences of local health staff thus compromising health service delivery².

Transition

In line with the recommendation by the IASC (the primary mechanism for inter-agency coordination of humanitarian assistance) that formally activated Clusters are only a temporary coordination solution to be used when existing coordination and response mechanisms are overwhelmed or constrained, the NNC was quick to initiate a transition³ process back to the government-led emergency response coordination mechanism. The government decided shortly after the response began that the NC leadership and functions would transition back to the NNC in June 2014. This date was decided despite the SRP funding for a year (through October 2014) and in the absence of a capacity assessment of the government cluster lead agency.

The transition process included a series of activities: setting the structure and documentation framework for regular NC coordination meetings, developing capacity mapping tools, and initiating work on the nutrition cluster preparedness and response plan and the nutrition cluster advocacy plan. Some of these actions were initiated as part of the transition process but were completed after the cluster had officially transitioned, as the date for transition was pre-decided and not tied to activities or indicators of capacity. The transition process and challenges to this are fully outlined in the case study report on the Philippines transitioning experience post-Haiyan⁴.

Learning from the Haiyan response

Key lessons from the response to Typhoon Haiyan include the following:

Treatment of acute malnutrition is not necessarily the most appropriate response to a natural disaster, particularly in a middle-income country. CMAM has been seen as the default NIE response, but other interventions may be more appropriate. Initial assessment and analysis should consider prevalence of acute malnutrition, stunting, micronutrient deficiencies, food access and availability, IYCF indicators and non-communicable diseases. To ease the situational analysis process required for the SRP in future responses, the NC has drafted a situational analysis with data depicting various potential scenarios. This has been developed and included in the preparedness plan of the NC, which will be used as a guide for future emergency response.

There was limited experience amongst traditional emergency response partners in the prevention of stunting. The programmatic shift from emergency CMAM programming to more developmental nutrition programming (with a focus on IYCF and micronutrients) took time, largely due to lack of capacity of partners at country

² Minutes of the Region 8 NC meeting, January 24, 2014.

³ Transition for the Philippine context entails the shifting cluster leadership back to government through a series of both formal and informal capacity building activities to help strengthen existing systems and ensure its sustainability.

⁴ Case Study Report by the International Solutions Group - Nutrition Cluster Transitioning Study on the Philippines experience post-Haiyan (2015)

level to re-orient their response. There is limited documentation and guidance on how to operationalise an emergency response that considers stunting, how to develop capacity in coordination and surveillance as part of the response, and what capacity this requires of partners.

A more comprehensive IYCF response was needed. In addition to increasing efforts to uphold and enforce the Code, approved national guidance is needed on how to identify and support non-breastfeeding mothers, non-breastfed infants and complementary feeding. Standard Operating Procedures (SOPs) are also required for how to report Code violations. Guidance and SOPs should be included in any community-level NiE training, as part of preparedness efforts.

IYCF in Philippines emergencies should include counselling on exclusive breastfeeding and complementary feeding, as well as cater for the needs of non-breastfed and mixed-fed infants. Essential competencies for implementers include skills in hand expression of breastmilk, alternative feeding methods such as cup feeding, relactation, and knowledge on the sourcing and preparation of appropriate complementary foods.

Social media and strong leadership from existing mother support groups facilitated the convergence of volunteer mother support groups, a valuable resource for the government during times of disaster. Future responses would be enhanced if a mechanism existed for nurturing, sustaining and recognising social media and existing groups to augment local health workers and government responders.

Response should focus on building existing systems and government capacity. Planning for cluster transitioning should be initiated as early as possible and aim to restore adequate and sustainable coordination and IM mechanisms. From the onset, the focus of all surge and regular staff should be on supporting government functions and building the capacity of the Government in emergency nutrition response, coordination and IM.

Engage sub-national nutrition clusters and government regularly to share information, make strategic decisions, discuss operational issues and develop plans and proposals. Regular calls between national and sub-national coordinators and cluster IMOs in the different regions should be scheduled regularly. Partner selection and PCA development should be discussed at national and sub-national level with the NCC to ensure that partners are working alongside government for common objectives. The SRP and project proposal development processes should be consultative and involve cluster coordinators at national and sub-national level as well as government and cluster partners to ensure its effectiveness.

Conduct capacity mapping and capacity development. Capacity-mapping that includes programme and coordination capacity of government and partners should be conducted (and regularly

updated) as part of preparedness activities. This information would be beneficial to cluster members and if reviewed in monthly meetings could support an overall capacity development plan. It would be useful to develop a capacity development plan (including government and partner trainings), a central repository for all common training materials, and an overarching monitoring and evaluation framework early on in the response (or as a preparedness action) to provide a framework and direction for future capacity development activities. Capacity building activities should be part of preparedness plans and linked to on-going capacity mapping activities. Where possible, consideration should be given to timings of trainings so as not to compromise health service delivery.

Capacity building efforts should support existing government staff and related systems as well as existing training mechanisms. Development of core competencies in NiE should be the outcome measure for training, not number of trainings or participants. Preparedness planning efforts on capacity mapping of partners should identify which partners (including local NGOs) have the technical and operational capacity to deliver specific programmes. Pre-response standby agreements should be developed through PCAs/Memoranda of Understanding, facilitating a fast-track future emergency response. Transfer of roles from surge staff to ministry should be an opportunity for capacity development. A responsibilities matrix with generic roles would serve as a helpful document to guide leadership on the process of who should prepare what, for whom and when.

IM

If prepositioned, forms and IEC materials would be more accessible to local governments and implementing partners. Pre-standing contracts with printing companies would allow for rapid printing during an emergency. It is necessary to establish or strengthen the existing Nutrition Surveillance system and nutrition reporting systems to support long term IM. A standardised training package for IM requires development, linking to nutrition surveillance both under regular and emergency programmes.

Transition

A transition plan should be developed at the onset of the emergency through open discussion at sub-national and national levels, based on government capacity and encompassing all activities in the SRP with an agreed timeframe.

Funding

It is challenging to raise funds for preparedness activities and surveillance systems, which are essential yet not as visible as actual service delivery. Funding for preparedness should be included in the NC advocacy plan and a fundraising strategy for nutrition preparedness developed, consistent with the Scaling Up Nutrition (SUN) costed national plan of action.

Rehabilitation and recovery activities should be incorporated in the SRP alongside nutrition

interventions. The SRP should reflect the various stages of the emergency and include interventions, indicators and targets for rehabilitation and recovery activities and initiatives in the nutrition sector plan.

It is important to engage with development actors on preparedness activities. While the cluster may have access to resources for preparedness, discussion on activities needs to be held in collaboration with development actors (both nutrition and non-nutrition sectors). Funding, capacity development and advocacy for nutrition are all areas where the cluster could collaborate with development actors under an umbrella of preparedness.

Conclusion

The response to Haiyan highlighted the pre-existing capacity gap for nutrition in terms of government-approved NiE policies, IYCF capacity, surveillance systems, a capacity development strategy for nutrition, and official reporting formats and mechanisms for nutrition. However, in response to Haiyan, NC efforts have addressed many of these gaps and the Philippines is in a stronger place currently in terms of government capacity, availability of guidelines and policies for nutrition. Although the international response to Haiyan has officially ended, NC staff and partners continue to work together to influence and develop long term nutrition plans to address the outstanding gaps. There is significant potential for the Philippines to leverage the momentum of the SUN Movement, which the Philippines joined in 2014, to support the integration of emergency nutrition response and preparedness and include this within the costed, multi-sector plan for nutrition.

For more information, contact: Aashima Garg, email: aashi07@yahoo.com; agarg@unicef.org



A man carrying his children in Tacloban, Leyte, Philippines, after Super Typhoon Haiyan (local name Yolanda) hit the province



South Sudan

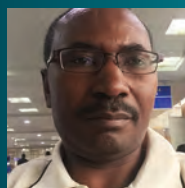
Overcoming nutrition information challenges

By Ismail A.R Kassim and Isack Manyama



Ismail A.R Kassim is a Nutrition information Manager with UNICEF and Chair of the Nutrition

Information Working Group.



Isack Manyama is the Nutrition Cluster Coordinator in South Sudan.

The authors gratefully acknowledge the contributions of Qutab Alam (Nutrition information Specialist of the Nutrition Cluster) and Mabasa Farawo (Nutrition Information Specialist of UNICEF). The ENN team supporting this work comprised Valerie Gatchell (ENN consultant and project lead), with support from Carmel Dolan and Jeremy Shoham (ENN Technical Directors). Josephine Ippe (Global Nutrition Cluster Coordinator) also provided support.

This article is a summary of a case study produced in a 2015 collaboration between ENN and the Global Nutrition Cluster (GNC). The full case study is available at www.ennonline.net/ourwork/networks/gnckm.

The findings and recommendations documented in this case study are those of the authors. They do not necessarily represent the views of UNICEF, its Executive Directors or the countries that they represent and should not be attributed to them.

Location: *South Sudan*

What we know: Since 2013, ongoing conflict has led to mass population displacement; resulting in a large scale, challenging humanitarian response.

What this article adds: The Nutrition Cluster has been active since 2010, co-chaired by the MoH and UNICEF. Cluster coordination is well capacitated, supported by equally strong UNICEF technical and information management capacity. A Strategic Advisory Group and Working Groups support cluster activities. The NC has prioritised information management due to significant gaps impeding programming quality and coverage. Actions have included development of a validation process for SMART surveys (with ACF and CDC support); training of partners and government; development of a nutrition information system; harmonisation of MAM/SAM reporting; and successful advocacy to integrate nutrition indicators in the Food Security Monitoring System. Strong leadership, cluster independence from UNICEF's technical role, and transparent communication with engaged partners have been critical to successes. Outstanding challenges include capacity in information management, engagement with development actors in preparedness planning and sustainability of staff and funding.

Overview of crisis in South Sudan

On 15 December 2013, violence broke out in South Sudan's capital Juba, quickly spreading to Jonglei, Unity and Upper Nile states. More than two million individuals fled their homes to internally displaced person (IDP) camps, United Nations (UN) compounds, other communities and neighbouring countries. Ongoing conflict has prevented them from returning to their homes. A Level Three emergency (the highest level) was declared in March 2014. The humanitarian community has responded with a wide array of interventions supporting emergency health, nutrition, protection, distribution of non-food items and education. However, due to continued conflict, the ability of humanitarian agencies to deliver food aid, provide basic health and other life-saving services and assess affected communities has been severely affected.

Nutrition Cluster (NC) governance

The NC has been active since 2010, co-chaired by the Director of Nutrition at the Ministry of Health (MoH) and UNICEF. At national level, the cluster coordination team is comprised of a NC Coordinator (NCC) (funded by UNICEF), a NC co-coordinator (funded by ACF and covers NCC role when NCC is away), a Deputy Cluster Coordinator (funded by WFP; 80% dedicated to the NC), an Information Management Officer (IMO) (funded by UNICEF; 100% dedicated to the NC), and a Monitoring and Evaluation Specialist (funded and seconded by the UN Office for the Coordination of Humanitarian Affairs (UNOCHA); 100% dedicated to the NC). The UNICEF nutrition team works closely with the NC team and is comprised of a Nutrition Specialist (P3), an Information Manager (P4) and two Assistant Information Managers (P3). Additionally, most non-governmental organisations (NGOs) have programme nutritionist/s who participate in cluster discussions and technical working groups.

All states have coordination focal points, usually identified among active partners. Through remote support and frequent visits, the NC national team support coordination and capacity development in cluster coordination and information management at sub-national levels.

The NC is supported by a Strategic Advisory Group (SAG) which advises the cluster on strategic issues and oversees activities implemented by the NC and partners. The SAG is comprised of technical representatives from international non-government organisations (INGOs), UN agencies and the Director of Nutrition, MoH. Additionally, the Government and NC partners participate in three technical working groups (WG): Nutrition Information Working Group (NIWG), Community Management of Acute Malnutrition Technical Working Group (CMAMTWG) and the Infant and Young Child Feeding Technical Working Group (IYCFTWG). WGs discuss technical issues in scheduled meetings and identify activities to develop technical capacity. Ad hoc committees are also created to address other technical needs.

Nutrition information

Prior to 2013, nutrition information was collected through multiple mechanisms with varying quality and limited coordination in decision-making. Key challenges to nutrition information management in 2013 included:

- Limited capacity within the MoH and partners on information management and poor quality reporting;
- Limited technical capacity among the MoH and NC partners on assessments led to poor-quality SMART surveys at different times of the year (and were therefore incomparable);
- Limited role of the NIWG in coordination, high turnover and variable engagement of NIWG staff and lack of robust survey validation methodologies led to inability to accurately advise on survey validation;
- Separate reporting forms for programmes addressing moderate acute malnutrition (MAM; World Food Programme (WFP)) and severe acute malnutrition (SAM; UNICEF) resulted in confusion and disputed numbers of reported beneficiaries;
- Poor quality and limited number of coverage surveys; and poor representation of nutrition in the Integrated Phase Classification (IPC) analysis;
- Poor quality, presentation, interpretation and timing of reporting of programme performance



WFP/Giulio d'Adamo

data led to an overall lack of understanding of the nutrition situation and needs.

As a result, during the crisis of 2013, interventions were uncoordinated, duplicative and nutrition information was contested, thereby failing to provide evidence for decision-making. The need to respond effectively required reliable nutrition information and it was agreed that a coordinated, validated Nutrition Information System (NIS) was necessary. From 2013 to date, the NC, with significant support from UNICEF, has worked to develop an NIS and build capacity in assessments to overcome these challenges.

Nutrition Information Working Group

A NIWG existed pre-2013 with a remit to review nutrition surveys for validation. One of the main challenges that limited the effectiveness of the group was the lack of consistency of individuals attending the NIWG meetings. Advocacy at the cluster meeting on the importance of continuity and technical capacity aimed to address this, and from 2014 onwards, partners were assigned to review survey results ahead of the presentations, which encouraged partners to identify staff with technical capacity in nutrition assessment to represent and regularly attend the NIWG. An annual calendar of NIWG meetings was developed for partners to plan their attendance in advance. While these efforts have resulted in a stronger, more coherent group, staff turnover remains a challenge.

Lack of individual partner capacity to review survey proposals and results confidently was also a challenge. This resulted in reliance on a few members to review surveys and proposals. However, several SMART trainings were conducted for partners in 2014 that built the confidence of NIWG members to participate more effectively.

Overall strengthening of the NIWG was addressed by revising and expanding its terms of reference to include the following:

- Technical streamlining of nutrition survey planning, implementation, information management and reporting;
- SMART survey protocol review and validation of results (see below);
- Platform for discussion of nutrition information issues;
- Direct technical support and guidance on nutrition surveys;
- Lead for the nutrition component of the IPC;
- Support to nutrition information management functions of the government;
- Building a repository of nutrition information from SMART surveys, routine data and other assessments with a nutrition component.

The NIWG is now comprised of members from UN agencies (FAO, WFP, WHO and UNICEF), MoH and national and international NGOs involved in nutrition and related programme interventions in South Sudan. The NIWG is chaired by the UNICEF Nutrition Information Manager. While the MoH agreed to hold the secretariat functions, this has yet to happen due to limited capacity within the MoH. A member of the NC team attends all NIWG meetings. The NIWG officially reports to the NC.

Nutrition assessment validation and capacity development

From 2011 to 2013, the NIWG collectively identified geographic areas in need of SMART surveys. Partners working in these areas committed to implementing the surveys in their areas of operation during pre- and post-harvest periods. More than 20 surveys were conducted annually during this period. Despite the review and validation of the surveys by the NIWG, the capacity of the group to review assessments confidently was questioned by humanitarian agencies in 2013. Delays in the validation process were also common. To address this, a revised survey validation process was developed and the capacity of the NIWG in nutrition assessments was strengthened.

Revised validation process

In 2014, UNICEF commissioned a review of the survey validation system. This recommended strengthening nutrition information through an externally supported/validated system, based on a similar system established in Somalia in 2011. The NIWG developed a new system for validating SMART surveys which initially included external support from the Global SMART Team (Action Against Hunger) (ACF) and the Centers for Disease Control (CDC) to review survey quality and build capacity of the NIWG. However by August 2014, external support was provided only upon request and not as a routine part of the survey validation process. The revised process for survey validation is as follows: All partners share their proposals for SMART assessments and the NIWG (which includes a South Sudan Government (GoSS) official) reviews, provides feedback on improving the proposals and ultimately validates them. Once a proposal is validated, the partner conducts the assessment. Preliminary results and data sets are submitted to the NIWG for review, suggestions and finally validation. The entire process from submission of protocol to validation could take about one to two weeks. CDC is only involved if there are concerns about survey results.

Nutrition assessment findings are communicated in the cluster meeting every two weeks and uploaded on the NC website alongside the final reports for the wider audience. Based on broad understanding of the process, open discussion of proposals and visibility of survey report findings, all partners now comply with this process.

Capacity development in assessments

Since early 2014, the NC has supported a large effort to build capacity in nutrition assessment. Various UNICEF-funded trainings on SMART survey methodology for partners and government were conducted by ACF as a special effort to build government and cluster-partner capacity. Trainings specifically for NIWG members and their agencies on how to review and check survey results have been conducted to build the confidence and technical capacity of the NIWG. Guidance has also been provided to partners to standardise methods and reduce the number of surveys conducted in the peak lean season to allow for increased comparability.

Improvement in programme data-harmonised reporting of a new Nutrition Information System (NIS)

The nutrition programme database prior to 2013 suffered from significant gaps and it was challenging to understand the nutrition situation, needs and trends prior to and shortly after the crisis. Routine programme data quality was poor in terms of completeness, accuracy and timeliness and availability of monthly reports. Additionally, partners were using different programme-reporting tools (one for the NC and one for WFP) and reporting separately to both WFP and the NC for Targeted Supplementary Feeding Programmes (TSFP). WFP received most of the reports and reported a considerably larger MAM caseload compared to that reported by the cluster, which created confusion.

Partners agreed that a new overall information system for programme data was needed, which involved a strategic collaboration between the NC, UNICEF and WFP. The NIWG led the process of collaboratively developing tools for data collection and designing a new NIS for emergency nutrition site-level programme data and information (including therapeutic feeding programmes, TSFPs, micronutrient interventions and infant and young child feeding (IYCF) programmes). This aimed to enable partners and the NC to improve nutrition programme data quality in terms of completeness, accuracy, timeliness and storage. It also facilitated the monitoring of cluster achievements against the Strategic Response Plan (SRP) targets.

As part of this process, the NC and WFP worked together to harmonise the TSFP monthly reporting tool and update the reporting mechanisms. Reports are now submitted through a common email account automatically linked to WFP and the NC IMO. WFP also informs the NC of the number of expected TSFP sites in each of their field level agreements (FLA) with partners. As a result, all partners that have a FLA with WFP now report information to both WFP and the NC. The harmonisation has assisted the cluster and WFP to track the number of

TSFP sites that are operational; this was not possible under the former system.

The overall NIS has introduced an online reporting function with a flexible submission period of two weeks. Once reports are submitted online, they are simultaneously received by MoH, WFP, UNICEF and the NC. The NC analyses and triangulates the reports against organisational programme information and sends the analysis to the Ministry before sharing with partners in the NC meeting. Monthly statistics are presented in NC meetings and partners not submitting reports are identified. The NIWG played a key role in reviewing the NIS reporting tool, pilot-testing and rolling out a training plan for utilising the NIS. The NIWG remains heavily involved in supporting the running of the NIS, advocates for report submissions, reviews and analyses reports and identifies reporting bottlenecks.

The NIS was launched in May 2015 in a number of counties supported by NGOs. A total of 520 outpatient therapeutic programme (OTP) sites and 460 TSFP sites contribute to the NIS (as of October 2015). More than 60 participants from 37 partners (NGOs and UN agencies) have been trained on the use of the system (as of August 2015). At the end of the month, a list of partners who have reported is compiled and shared at the next NC meeting. This new process has resulted in huge reporting improvements for sites by NGO partners from 30% (2014) to 85% (2015).

In order to continue to develop capacity for NIS within NC partners, the NC is supporting several ongoing initiatives. A pool of 'master trainers' on the NIS has been developed directly by the NIWG (who were initially trained themselves and then rolled out training of trainers) and is available to support individuals or other organisations in developing their capacity in using the new NIS. A state-level training is also planned. Additionally, the cluster IMO has an open-door daily surgery from 14:30 to 15:30 for partners for coaching on information management.

Integration of nutrition in Integrated Phase Classification (IPC)

The IPC is run by a technical WG comprised of Ministry of Agriculture (MoA; chair), MoH, UN and NGO partners. Implementation of the IPC is divided into food security (Led by the MoA) and nutrition (led by the NIWG) components. The MoH approves the attendance of the nutrition partners and facilitates the attendance of the state MoH nutritionist in the IPC workshop.

Initially Mid-Upper Arm Circumference (MUAC) was the only nutrition indicator in the IPC; as a result of NIWG advocacy, weight and height are now collected and calculated as part of the IPC analysis. IPC nutrition situation maps for South Sudan (see map) are now possible. Colours identify the category levels of malnutrition. The level of malnutrition is agreed based on a variety of information sources where SMART survey results (providing county level data) are prioritised. Other assessment results (such as Food Security and Nutrition Monitoring System (FSNMS) surveys that are state-level and mass MUAC screening data) are used where SMART survey results are not available.

Integration of nutrition indicators and improved quality of the Food Security Monitoring System (FSMS)

The FSMS is a joint collaboration between WFP, FAO and UNICEF to conduct food security assessments (including MUAC assessment) at state level three times a year. The NIWG provides technical support on behalf of the NC in planning, implementation and analysis of nutrition data.

The FSMS faced many challenges, including low capacity and high turnover of staff (with capacity), resulting in poor data quality. To address these challenges, in the first quarter of 2015 WFP, FAO and UNICEF carried out a training of trainers (TOT) targeting state-level focal points. The training covered a wide range of topics, including methodology and standardisation tests for SMART survey. After the TOT, the training was cascaded out to state-level teams with support from national-level UN and NGO trainers.

As a result of advocacy by the NIWG, nutrition indicators have been added to the assessment (July 2014). The renamed Food Security and Nutrition Monitoring System (FSNMS) now reports detailed, state-level estimates of global acute malnutrition (GAM) which provide information in areas where SMART surveys have not been conducted. The combination of food security assessment with anthropometric indicators provides a comprehensive understanding of the overall situation at the state level. This information is available to partners, including the MoH, for planning and developing the SRP.

The quality of data from the first round of FSNMS was limited, which resulted in a lack of precision and confidence in the results. The NIWG reviewed and recommended ways to improve data quality, including increasing the sample size and advocating for partners to supervise and monitor assessment fieldwork. State-level trainings have been implemented and a learning exercise was led by UNICEF. While there are still challenges in FSNMS data quality, these initiatives have contributed to an overall improvement in quality of nutrition indicators compared to the first round, as evidenced by a decrease in the rejection of state survey results based on SMART plausibility assessments.

The assessment is now jointly funded by UNICEF, WFP and FAO with strong involvement from MoA, MoH, the Humanitarian Wing of the Government of South Sudan (GoSS), the Relief and Rehabilitation Commission (RRC) and the Bureau of Statistics (who conduct the sampling), to ensure GoSS ownership. The MoH focal points at national and state level are all involved in the training, data collection and other critical functions within the FSNMS and IPC data management and utilisation from start to finish.

Learning

Reflection on the process of improving the nutrition information capacity and systems in South Sudan from 2013 to 2015 highlights the following points of learning:

- Strong leadership of the NC and teamwork between NC and UNICEF's Nutrition Section supported increased collaboration and coordination

to move forward initiatives to improve processes and systems. Furthermore, the separation of line management and physical offices within UNICEF of the NC and UNICEF Nutrition Section allowed the NC to retain an element of independence from UNICEF.

- The large team of technical support (UNICEF nutrition staff, UNICEF nutrition information staff and partner technical staff) feeding into and supporting the NIS has allowed for NC staff to focus on core cluster functions.
- Honest, open collaboration with partners around issues and challenges resulted in innovative ways to move forward collectively. Harmonising programme data reporting is a good example of this. The consultative, collaborative process allowed for the development of a common understanding, resolution of misunderstandings and sharing of experience and expertise.
- Improved understanding of assessments, data analysis and survey validation against standard criteria has enhanced transparency and credibility of the NIWG and the NC at national level. It is recognised that gaps still remain within the MoH at state level. Advocacy by NC partners is crucial to build MoH understanding of the importance of information systems in relation to preparedness and response planning and to assign more MoH staff to work on this technical area, both nationally and sub-nationally.
- Capacity building has been, and continues to be, a process of trainings, one-on-one support and supervision and feedback that needs to be tailored to the situation. Information system capacity development efforts have focused on building skills of the NC partners and, to some degree, MoH staff. The capacity of the MoH to lead and implement the NIS and engage technically in the NIWG remains limited. Given the high turnover of NGO staff and the importance of embedding capacity within MoH to ensure sustainable management of the NIS system and effective future response to nutrition crises, capacity development efforts of the NC should focus on building capacity of MoH at national and sub-national level. It is recognised that this is a long-term process and may require a shift in strategy leveraging the collective technical capacity of the NC.

Conclusion

As a result of the combined efforts of NC staff, the NIWG and partners, the NC is in a much stronger position to report on and advocate around the nutrition situation across South Sudan. An improved NIS and capacity to manage and analyse data will greatly support future responses.

While challenges remain in terms of MoH capacity in information management, engagement with development actors in preparedness planning and sustainability of staff and funding, the NC is equipped with increased capacity and credibility to work through these issues.

For more information, contact: Ismail Kassim, email: ikassim@unicef.org, or Isaack Manyama, imanyama@unicef.org



Somalia

Changes to Nutrition Cluster governance and partnership to reflect learning and operational realities in Somalia

By Samson Desie



Samson Desie is Nutrition Specialist working in the sector for more than a

decade and currently working as Nutrition Cluster Coordinator, with UNICEF Somalia.

The ENN team supporting the development of this case study comprised Valerie Gatchell (ENN consultant and project lead), with support from Carmel Dolan and Jeremy Shoham (ENN Technical Directors). Josephine Ippe, Global Nutrition Cluster Coordinator, also provided support.

The author would like to acknowledge all the members of the Somalia Nutrition Cluster Strategic Advisory Group for their review and input into this document and their support in the process.

This article is a summary of a case study produced in a 2015 collaboration between ENN and the Global Nutrition Cluster (GNC). The full case study is available at www.enonline.net/ourwork/networks/gnckm.

The documented findings and recommendations are those of the authors. They do not necessarily represent the views of UNICEF, its Executive Directors or the countries that they represent and should not be attributed to them.



Women from Kabasa Internally Displaced People's camp return from fetching water from the river Jubba

Location: *Somalia*

What we know: Somalia has a long history of conflict and insecurity and is a particularly challenging operational environment to coordinate nutrition programming. The nutrition situation is chronically poor, characterised by prevalent acute malnutrition.

What this article adds: This case study details the limitations around the rapid expansion of nutrition services in Somalia in response to the 2011-2012 famine and subsequent rationalisation of the Nutrition Cluster to improve nutrition coordination, governance and service delivery. Key learning from this process is identified. The new way of working is centred on accountability to affected populations, greater partner inclusivity, a more representative steering advisory group, focused working groups, two dedicated in-country coordination positions, and attention to sub-national coordination. The Nutrition Cluster is engaged in a nascent SUN movement in Somalia. Outstanding challenges include lack of funding, insecurity and difficult monitoring.

Country overview

Since the early 1990s, Somalia has been plagued by violence and insecurity, resulting in large population movements and several internally displaced people's (IDP) camps in the south. Insecurity remains a large threat due to clan fighting and Al-Shabaab activity. Since September 2012, Somalia has been guided by an internationally supported plan (Vision 2016) with the aim of federalising by the end of 2016.

Somalia suffers from a chronically poor health and nutrition situation, characterised by prevalent acute malnutrition (national prevalence of GAM > 15%, higher amongst the displaced); micronutrient deficiencies (iron deficiency anaemia, vitamin A) at WHO emergency levels, and poor feeding practices (5.3% exclusive breastfeeding rate, 17.1% timely introduction of complementary foods¹).

Nutrition service delivery

Nutrition service delivery is guided by the Somalia Nutrition Strategy (SNS). The Joint Health and Nutrition Programme (JHNP) implements a Basic Nutrition Services Package (BNSP) that includes

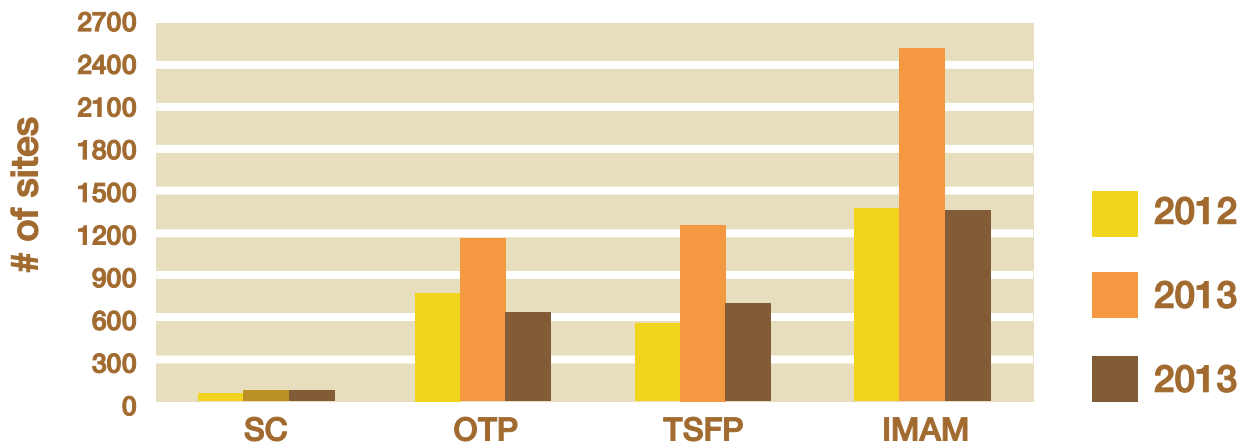
Maternal and Child Health, Expanded Programme on Immunisation, Nutrition, and Hygiene Sanitation promotion, and that encompasses management of acute malnutrition. However, nutrition service delivery is fragmented and there is duplicative humanitarian/development programming.

Nutrition Cluster (NC) partners largely work under these policies and services to address acute malnutrition through an Integrated Management of Acute Malnutrition (IMAM) approach. In 2011, in response to the 2011-12 famine, the NC launched a rapid scale up of IMAM services including inpatient therapeutic care via Stabilisation Centres (SC), outpatient therapeutic care programmes (OTP), and supplementary feeding programmes (SFP). IMAM service plans outlining services to be delivered and identifying partners were developed for each district with partners, UNICEF and local authorities.

Limitations and challenges as a result of scale-up

Because of the urgency of the famine response, ex-

¹ FSNAU National Micronutrient and Anthropometric Survey, 2009

Figure 1 IMAM service expansion 2012-2014


pansion and opening of new service delivery points was driven largely by need and access rather than as part of a strategic process. While integration of the delivery of health and nutrition services was promoted at the strategic level (e.g. Strategic Response Plan (SRP)), at an operational level, health and nutrition service delivery remained largely fragmented due to institutional segmentation and parallel health systems and structures, with different modalities for financing² in the South Central Zone (SCZ). Some areas were “over-served” while others had limited service, with multiple and mixed layers of agency partnership and consequent duplicative funding and administrative mechanisms.

Rationalisation 1.0

Towards the end of 2012, there were noticeable improvements in the nutrition situation and a decline in humanitarian funding. In response, in 2013, the NC embarked on a consultative programme rationalisation process (Rationalisation 1.0) to develop district service plans for nutrition in SCZ. (Rationalisation refers to the process of reviewing nutrition needs geographically and redistributing partners to cover gap areas.) The process considered capacity, access, expected caseload and clan affiliation among

other issues. Through this process, one partner was selected based on its comparative advantage over others to deliver services in a given district.

While Rationalisation 1.0 was conducted collaboratively and partners were identified to provide nutrition services across SCZ, major challenges remained around service delivery, selection of partners and monitoring. These are detailed below.

Nutrition programme service delivery challenges

- There was no clear strategy for integrating nutrition into primary health care services.
- The rollout of JHNP/BNSP (which aimed to shift from vertical to horizontal programming and integrate health and nutrition services) began towards the end of 2013, in the middle of Rationalisation 1.0. No guidance was provided on how to account for other programmes and funding streams in the district planning process.
- Post-emergency integration of IMAM into state services was not feasible due to absence of a long-term nutrition plan. Additionally, there was no guidance on what should constitute a long-term IMAM service plan and what should be considered a short-term emergency/surge (preparedness) programme.
- Lack of flexibility from a few partners in readjusting their programme plans to conform to the rationalised service plans resulted in overlap of programmes in some areas and gaps in services in other areas.
- Lack of standardisation of admissions criteria for OTPs and SFPs led to lack of operational alignment in some districts.
- Partners largely had funding for one nutrition service (for example, inpatient treatment of acute malnutrition) with no capacity for other related nutrition services (minimum nutrition services were only agreed in November 2015). Children in OTPs were therefore not discharged to SFPs or admitted to the inpatient care facility as needed.
- Lack of clear criteria for defining mobile OTP and TSFP sites sometimes led to arbitrary and unverifiable sites (that were not located in Somalia).

Selection of partners

- In some regions (e.g. Bakool, Bay, Galgaduud, Benadir), consensus amongst implementing partners on geographic areas of programme coverage was not possible due to some partners’ inability to shift due to access and funding issues. In such cases, the NC, in collaboration with UNICEF and WFP, chose the implementing partners they would support.
- Clan and access considerations made it difficult to settle on one or two partners per district and in some cases, clan authorities recommended multiple partners.
- The absence of harmonised risk management criteria and transparency across agencies resulted in different levels of risk assessment for partners and inconsistent approaches to securing partners as a result.
- A parallel planning and selection process for BPHS was being undertaken with differing criteria and timeframes, which created challenges for partnership selection.
- Some partners did not share details about their longer-term funding and therefore plans of some long-term partners could not be factored into the rationalisation process.

Monitoring

While the Food Security and Nutrition Unit (FSNU) surveys are conducted twice a year, there is no routine nutrition surveillance mechanism in Somalia (i.e. there is no routine growth monitoring at health centres or OTP/SFP sites). Partners had limited capacity to produce quality reports (reports produced were often incomplete and delayed) and conduct informative, rapid assessments. This has led to a slow response to emerging hotspots. Additionally, verification of a partner’s capacity and operations was limited due to insecurity and access. While third-party monitoring was thought to address this, conflict of interest and collusion have caused this to be largely ineffective.

² These include: public sector funding (2-4% of the total budget is ear-marked for health); United Nations Development Assistance Framework (UNDAF) humanitarian funding; the SRP (CHF, CERF); JHNP (funding mainly from DFID, AusAID, Sweden, USAID, Finland and Swiss); and Islamic Organizations Cooperation (IOC) funding (UAE, Turkey, Qatar, etc.).



Sebastian Rich, UNICEF Somalia 2015

Rationalisation 2.0

As a result of the challenges to service delivery identified above in early 2015, the NC embarked on a second rationalisation process, Rationalisation 2.0. This aimed to revise service delivery collaboratively with a focus on ensuring services to the most vulnerable. It also aimed to decrease the overall number of partners implementing nutrition services without compromising service delivery. The concept of primary, secondary and tertiary partners was introduced whereby the primary partner is accountable for ensuring nutrition services for the entire district whenever and wherever possible. Primary partners would be able to work in partnership with either the secondary or tertiary partner to ensure complete geographic coverage of all services throughout the district. Secondary and tertiary partners were identified in case a primary partner failed to secure resources, could not cover the entire district, and/or failed to provide services on time.

While there is no systematic linkage to the cluster, in consultation with partners and the JHNP team, the NC gave priority to JHNP partners in districts where JHNP exists. As primary partners, it is assumed that they can absorb the nutrition caseload. However, if acute malnutrition increases and surge capacity is needed to support a greater number of cases, the NC has a secondary and tertiary partner in place to support the additional need.

The process for Rationalisation 2.0 has consisted of:

- I. Mapping current service delivery, verified by the Strategic Advisory Group (SAG) (independent geotagging of sites to be conducted).
- II. Review and/or development of IMAM service plans (including therapeutic feeding and supplementary feeding) with defined criteria for static, outreach/mobile services.
- III. Selection of organisations to implement the IMAM service plan using defined eligibility criteria and taking into account potential caseloads and partner capacity.

The NC coordinated a network of 141 active partners (pre Rationalisation 2.0), of which almost 80% (111) are national NGOs, mostly based in SCZ. Almost all national NGOs worked in partnership with INGOs and UN agencies, often with an overlap of contracts and/or a chain of sub-contracts. After Rationalisation 2.0, there were 99 partners, of which 71% (70) are national NGOs.

Mutual respect and accountability have guided the process, upheld through the partners' common commitment to the principles of partnership. Value for money and ensuring economies of scale were also considered in partner selection.

While the process is ongoing, experience to date highlights the need to delicately manage conflict of interest (arising from partners influencing government officials and local authorities) and partner/government expectations, given the reduction in number of partners resulting from the process. Allowing time for these issues to

be addressed has extended the process but has enabled wider discussion on accountability to affected populations, which has dispelled some of the competition among partners. A concurrent shift in NC governance has supported this new approach to service delivery.

Nutrition Cluster governance 2011-2013

The NC was fully functioning and led by a Nutrition Cluster Coordinator (NCC) and Information Management Officer (IMO) during the rapid scale-up and Rationalisation 1.0. However since late 2013, nutrition coordination has been significantly weakened, in large part due to a 10-month absence of an NCC, weak government engagement in the NC (due to lack of technical capacity and political instability) and a policy shift in the coordination forum (moving coordination from Nairobi to Mogadishu). Regular coordination functions essentially collapsed.

National NC coordination meetings were being held on a monthly basis in Nairobi, Kenya until 2013, but due to international pressure to support the Transitional Government of Somalia (TGS), nutrition coordination was officially relocated to Mogadishu in November 2013. Mogadishu meetings are chaired by a national Cluster Support Assistant and co-chaired by the MoH representative from the Federal Government of Somalia. These meetings have been largely ineffective, due mainly to the limited number of partners regularly operating in and around Mogadishu and the absence of decision-makers at meetings. Due to insecurity, international staff, including the Nairobi-based coordination team, are unable to travel to Mogadishu to participate in the meetings. Additionally, NC partners from different parts of Somalia faced security challenges in travelling to Mogadishu.

During this time, Somali sub-national nutrition coordination mechanisms also came to a standstill. UNICEF programme staff supported coordination efforts in terms of collecting reports

at sub-national level in some areas. Additionally, UNICEF programme staff represented the cluster in the Inter-cluster Coordination Group (ICCG) and Humanitarian Country Team. This shift of representation from dedicated cluster staff to UNICEF programme staff ("double-hatting" to cover cluster coordination functions) created confusion among partners regarding the responsibilities of UNICEF as a partner and as the Cluster Lead Agency (CLA) for Nutrition.

Cluster functions in Somalia were poor and limited to a few operational tasks during this period. The 2014 Somalia Nutrition Cluster Performance Evaluation also indicates that five out of seven key cluster functions were "weak". These were: informing strategic decision-making of the Humanitarian Coordinator/Humanitarian Country Team (HC/HCT) for the humanitarian response, planning and strategy development, advocacy, contingency planning/preparedness, and accountability to affected population.

The NCC post was eventually filled in December 2014 and a review of the cluster and coordination mechanisms was conducted. A two-day (12-13 January 2015) consultative workshop was organised to revitalise the coordination mechanism and identify a more systematic and integrated approach. This involved 66 participants representing the management and technical team of all partners and stakeholders, high-level MoH officials (Director Generals) and the UNICEF Representative for Somalia. Plans for maintaining coordination in Nairobi, restructuring zonal nutrition cluster sub-coordination mechanisms, activation/ re-establishing of key working groups and rationalisation of partners were reviewed and agreed.

The workshop also endorsed the strategic documents developed by the NCC, including a roadmap for the NC, the Somalia NC strategic operating framework and annual work plan (2015), Standard Operating Procedures (SOPs) for nutrition surveys and assessments, an annual calendar for zonal nutrition cluster sub-coordi-



Sebastian Rich, UNICEF Somalia 2015

nation and draft simplified guidance for estimating severe acute malnutrition burden and target caseload. Following the workshop, relevant guidance notes, NC SOPs and terms of reference for Working Groups were developed and endorsed.

Shifting to this new structure and way of working has been a gradual process. Each structure was reviewed and agreed upon through a series of consultations at Nairobi and field level.

New governance structure and way of working (2015)

Accountability to affected populations (AAP). The new way of working is centered around ensuring AAP through coordinated and inclusive systems. Partners are required to sign a Memorandum of Understanding articulating their accountability to the population and committing to uphold AAP principles.

Inclusivity. As a result of the workshop, cluster partners agreed to function in a more inclusive and integrated manner. To this end, key cluster functions will be shared with specific partners and working groups for collective accountability, responsibility and shared vision and/or ownership with full oversight of the cluster coordination.

SAG. The SAG was re-established as the highest decision-making body for the cluster and it was collectively agreed that the SAG would maintain neutrality, independence and representation of the cluster partners. The SAG is composed of nine members; three local NGO representatives (increased from one previously), two international NGO representatives, two UN (UNICEF & WFP), one government official (Director General) and a representative of the Somalia Nutrition Consortium (which is made up of four INGOs). While UNICEF and government hold permanent seats, others rotate annually for membership and biannually for chairmanship among the members. The government will continue to co-chair the various meetings wherever and whenever possible.

Working groups. Working groups are to be specific and partner-led with oversight from the SAG. A working group on Assessment and Information management (AIMWG) has been established and is chaired by the Food Security and Nutrition Analysis Unit (FSNAU).

Human resources. Through strong backing and support of UNICEF as the CLA, two new posts for in-country coordination have been agreed upon. Hiring of these staff was ongoing as of October 2015. Additionally a capacity development plan is being developed by the CLA and strong technical partners to strengthen technical capacity of all partners and improve service delivery and AAP.

Sub-national coordination. Chairs and co-chairs for 11 sub-national coordination mechanisms have been elected.

Coordination meetings. Sub-national coordination and working group meetings have been streamlined so that discussions and outputs of

one meeting feed into the next. Sub-national and Mogadishu-based meetings will be held on a monthly basis with available partners. These feed into quarterly sector coordination meetings chaired by government (with NC coordination representation and support) in Mogadishu. Outcomes and follow-up actions of the monthly cluster and quarterly sector coordination meetings will inform the agenda of the Nairobi level cluster coordination meeting, which will be held on a quarterly basis. Finally, the SAG and AIMWG will convene monthly and on an ad-hoc basis as necessary.

The NC and Scaling Up Nutrition (SUN)

Somalia joined the SUN movement in March 2014, although there was limited traction until a new Prime Minister was appointed in September 2015. Somaliland and Puntland have also joined the SUN movement and have already developed multi-stakeholder platforms. Currently a committee is working to establish the multi-stakeholder platform for Somalia-Mogadishu. The NC is fully engaged in supporting the SUN movement as documented in the Strategic Response Plan (2016) and it is actively linking its network of partners on the ground. The NCC or NGO co-chair engages in the SUN platform meetings.

Lessons learned

Reflection on the process of rationalisation and restructuring the governance and way of working highlights the following points of learning:

- An extended gap in presence of an NCC and lack of NC architecture led to absent NC coordination. Shifting coordination responsibilities to UNICEF programme staff (double-hatting) created confusion amongst partners on the role of the NC and the CLA.
- While politically appropriate, moving coordination activities to Mogadishu has necessitated the continuation of Nairobi-based coordination activities, thus adding an additional layer of coordination.
- The new way of working, grounded in strong leadership by the NCC, has fostered increased trust, transparency, openness and working relationships among partners and strengthened credibility of the NC. It has resulted in increased support and buy-in around cluster activities (eg leading working groups, SAG membership) and honest discussion around issues leading to effective solutions.
- Expansion of SAG membership to include three local NGOs (instead of just one), together with clarity of SAG role, has increased NC credibility, partner engagement and the feeling of inclusiveness.
- Incorporating AAP at the highest level in the NC to focus on the affected population has resulted in greater sharing of resources to cover a vulnerable area and recognition of partners' comparative advantages and capacity when selecting primary, secondary and tertiary partners in the Rationalisation

2.0 process.

- Expansion of the SAG's role in coordination, increasing partners' role in working groups and securing additional staff to support cluster functions distributes the NC workload and allows for wider participation of partners. In the absence of an NCC, working group activities can still move forward with leadership and direction of the lead agency and the SAG.
- There is need for a political analysis when programming through local partners within a clan-based governance system. Including Director Generals of Health from Somaliland and Puntland in NC meetings and dialogue has fostered a wider understanding of nutrition coordination issues faced in these other regions and has improved Director Generals' support for nutrition coordination initiatives launched by the NC.
- Strong leadership from the NCC combined with robust technical capacity of the NC team members and partners has allowed the NCC/NC staff to focus on coordination issues.

Conclusion

While there have been significant advances in nutrition coordination through 2015, the rationalisation process and governance restructuring still face challenges including lack of funding, insecurity and weak monitoring. Yet, due to the strength of the collective and strong leadership, nutrition coordination in Somalia is now in a very strong position to advocate for and implement nutrition priorities. Additionally, there is potential for the NC to guide and support the SUN movement, particularly with regard to integrating preparedness planning and emergency response planning in multi-sector plans. This would strengthen nutrition capacity in Somalia significantly.

For more information, contact: Samson Desie; somalia.nut@humanitarianresponse.info or sdesie@unicef.org



Sebastian Rich, UNICEF Somalia 2015



Bangladesh

Bangladesh Nutrition Cluster

A case in preparedness

By Andrew Musyoki and Anuradha Narayan



Andrew Musyoki is a Nutrition Specialist with UNICEF Bangladesh

Anuradha Narayan is the Chief of the Nutrition Section, UNICEF Bangladesh.

The authors would like to acknowledge the financial contribution of ECHO and UNICEF in the implementation of the cluster project. The contributions and work of all cluster partner member organisations is highly appreciated. Special thanks to the case study working group members comprised of ACF, WFP and SCI.

The ENN team supporting this work comprised Valerie Gatchell (ENN consultant and project lead), with support from Carmel Dolan and Jeremy Shoham (ENN Technical Directors). Josephine Ippe, Global Nutrition Cluster Coordinator, also provided support.

The authors would like to thank all Nutrition Cluster (NC) partners for their work and acknowledge the NC working group that supported the development of this article: Dr. Ojaswi Acharya, Head of Department, Health and Nutrition, Action Contre La Faim (ACF) Bangladesh; Dr. Golam Mothabbir, Senior Advisor, Health and Nutrition, Save the Children Bangladesh; Rachel Fuli, Head of Nutrition, World Food Programme Bangladesh; and Dr. Alamgir Murshidi, Institute of Public Health Nutrition (IPHN), Government of Bangladesh.

This article is a summary of a case study produced in a 2015 collaboration between ENN and the Global Nutrition Cluster (GNC). The full case study is available at www.ennonline.net/ourwork/networks/gnckm.

The documented findings and recommendations are those of the authors. They do not necessarily represent the views of UNICEF, its Executive Directors or the countries that they represent and should not be attributed to them.

WFP/Kamrul Mithon



Location: *Bangladesh*

What we know: Bangladesh is particularly prone to natural disasters, such as cyclones and floods. Acute and chronic malnutrition are prevalent.

What this article adds: In 2012, the Government of Bangladesh (GoB) established a non-IASC national cluster system for all sectors focused on emergency preparedness. A Nutrition Cluster Coordinator provides both technical support to UNICEF programming (including SAM treatment scale up) and coordination (<50% time). Strategic areas of focus are nutrition coordination, assessment, information management, capacity development, nutrition programme support and cross-sectoral engagement. Challenges include district levels gaps in data collection and coordination capacity; lack of funding for preparedness; absent community based SAM treatment; and lack of a multi-sectoral framework. Sub-national clusters have been effective in response, partnerships with academic institutions have enabled training, assessment and capacity development. Coordination is currently in transition to develop one national streamlined forum to coordinate nutrition programming.

Country overview

Bangladesh has the highest percentage of its total land area and 97.7% of its population at risk of multiple hazards (World Bank, 2005). The country also has the second-highest absolute and relative mortality risk for floods (UN, 2009). Over 20 districts are highly vulnerable to cyclones, floods, flash floods and water-logging. Bangladesh also has persistently high levels of acute malnutrition (wasting) across the country, with a national average of 14% global acute malnutrition (GAM), of which 3% is severe acute malnutrition (SAM). Stunting is 36% nationally and underweight is 33%. While stunting decreased from 51% to 41% over 2007 to 2011, Bangladesh is unlikely to meet the World Health Assembly target of a 40% reduction in stunting of children under five years of age by 2025. The exclusive breastfeeding rate significantly decreased from 2011 (65%) to 2014 (55%), while quality and diversity of meals for children aged 6-23 months is low (Bangladesh Demographic and Health Survey, 2014). Prevalence of anaemia in pre-school age children is at 33.1% and 26.0% among pregnant and lactating women (National Micronutrient Survey, 2013).

History of the Nutrition Cluster (NC)

The Nutrition Cluster (NC) in Bangladesh was initially activated in 2007 in response to Cyclone Sidr. However, unlike other clusters, no dedicated NC coordination staff were put in place (UNICEF nutrition staff chaired a few initial national-level cluster meetings), and there was no consolidated NC response plan. NC partners, including UNICEF, WFP and a few national and international non-governmental organisations (NGOs) implemented responses mainly related to IYCF, blanket supplementary feeding and targeted distribution of multiple micronutrient powders in cyclone-affected areas. Programme discussions were held in the Nutrition Working Group (NWG) meeting, an information coordination group recognised by both the Ministry of Public Health (MoPH) and the Institute of Public Health Nutrition (IPHN), co-chaired by UN agencies and NGOs.

During this time it became clear that national emergency response experience was very limited. Not one of the 36 local NGOs prequalified by the UN agencies to undertake emergency response had the capacity to respond to nutri-

tion. While some nutrition policies provided structure and guidance for emergency response (such as the IYCF and anaemia strategy), there was an absence of guidance on management of acute malnutrition, assessments and supplementary feeding.

A UNICEF-commissioned review, four months post-SIDR, recommended actions for preparedness and suggested how national and sub-national level coordination structures should be organised and led (and by which government body), with support from UNICEF. Recommendations were not reflected in subsequent UNICEF and government plans due to ongoing discussions on how to harmonise nutrition functions across the government (IPHN, the Nutritional Nutrition Programme (NNP) and MoPH). Additional analysis conducted by UNICEF in 2012 again documented gaps in nutrition emergency response capacity and preparedness. These were:

- Weak pre-crisis/routine nutrition programming within government facilities, including mainstreaming of proven direct nutrition interventions into the existing health system, especially management of SAM.
- Inadequate nutrition information systems for routine monitoring at national and sub-national levels (including acute malnutrition).
- Low capacity of service providers, cluster members and partners in Nutrition in Emergencies (NiE), including area-based nutrition assessment, planning and response.
- Lack of national guidelines on area-specific nutrition assessments.
- Weak orientation of district and sub-district authorities on NiE.
- Lack of strong coordination within the nutrition sector in general, impeding linkages between development and humanitarian actions.

In August 2012, after years of advocacy and lobbying by humanitarian actors (including donors) for a formal mechanism to address NiE and preparedness, the Government of Bangladesh (GoB) established a national cluster system for all sectors to focus on preparedness for a predictable response (this is not an IASC-mandated cluster system, but one mandated by the GoB). For nutrition, this mandated mechanism complements other nutrition coordination forums such as the UN Ending Child Hunger and Undernutrition Partnership (UN REACH), Scaling Up Nutrition movement (SUN) and the NWG. UN REACH works on upstream nutrition advocacy issues, bringing together the different UN agencies and supporting the SUN movement. The NWG brings together nutrition stakeholders to discuss and share emerging issues in nutrition. The NC is a member of the NWG and has been engaged in the preparation of advocacy documents, such as the common narrative on undernutrition in Bangladesh produced by UN REACH.

Bangladesh Nutrition Cluster: purpose, national and sub-national governance and funding

The aim of the NC in Bangladesh is to support the GoB in the coordination of effective emergency preparedness and response to humanitarian crisis that meets core commitments and standards, through strengthening the collective capacity of humanitarian actors working in the area of nutrition in Bangladesh. The structure is outlined in Figure 1. The NC operates under the Government's policy body for emergencies, the Local Consultative Group-Disaster Emergency Response (LCG-DER). The LCG-DER is mandated to ensure effective coordination of the national and international stakeholders in the broader scope of disaster management (risk reduction,

preparedness, relief/response and recovery/ rehabilitation) and is the central forum for decision-making on disaster management. Under the LCG-DER is a Humanitarian Coordination Task Team (HCTT), a government body that functions in a similar way to the Humanitarian Country Team (HCT) mechanism in IASC cluster countries. The HCTT is led by the UN Resident Coordinator (UNRC) with a co-chair from the Ministry of Disaster Management (MoDM). Membership of the HCTT is composed of all cluster leads, a representative of the NGOs and donor agencies (European Commission Humanitarian Aid and Civil Protection Department (ECHO) and DFID).

The NC focuses particularly on preparedness and is available to provide support to the GoB and LCG-DER in times of both slow and sudden-onset emergencies. For example, the NC provided support to people affected by floods in Satkhira district through blanket supplementary feeding to over 1,000 beneficiaries.

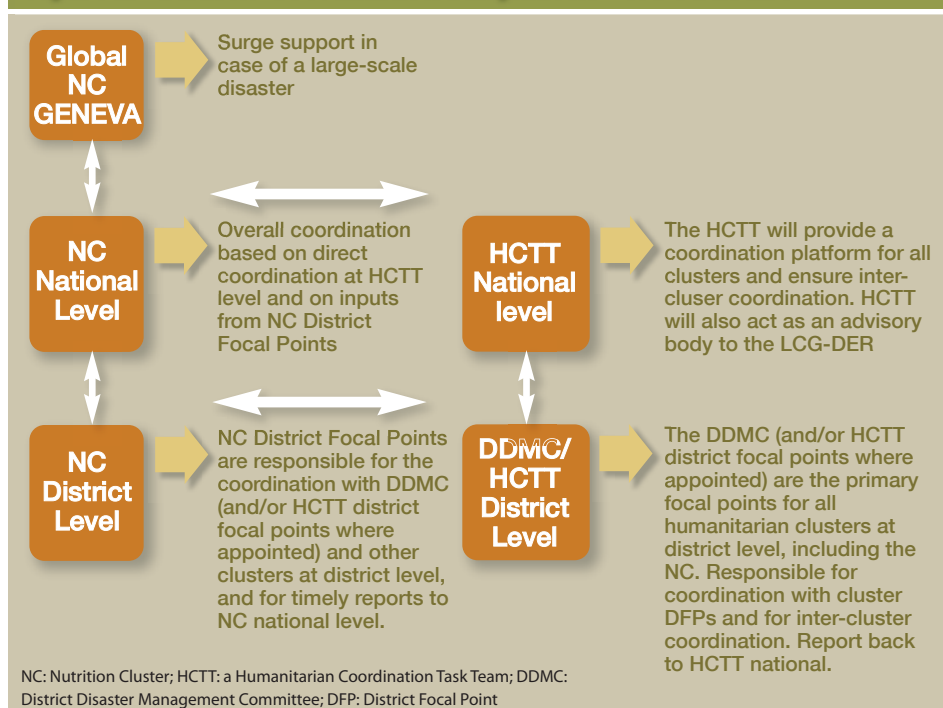
UNICEF and the IPHN, which sits under the Ministry of Health and Family Welfare (MOHFW)¹, co-chair the National Cluster. The NC consists of over 15 member organisations, including UN agencies, international and local NGOs, national institutes and research/academic institutions. At sub-national level, the civil surgeon leads the district-level nutrition coordination, while UNICEF's District Nutrition Support Officers (DNSO) act as facilitators and co-lead.

The national NC has two working groups focusing on acute malnutrition and assessments; IYCF issues are addressed by the active IYCF alliance movement in Bangladesh. Other working groups are established as needed. There are clear lines of communication from district to national level in the event of a disaster.

In addition to emergency response coordination, sub-national NC forums are used to further the agenda of mainstreaming Direct Nutrition Interventions (DNIs) into the health sector and to engage other sectors in nutrition-sensitive interventions. DNSOs have actively been engaging multi-sectoral partners (including health, education, agriculture and water) in routine coordination meetings to identify and address bottlenecks to mainstream DNIs; to set DNI targets and to review progress. The dual focus of emergency response coordination and routine district nutrition programming was determined the most cost-effective use of district resources.

The NC in Bangladesh is managed by two UNICEF nationally based, full-time staff, an NC Coordinator (NCC) and an Information Management Officer (IMO). Both provide technical support to UNICEF's Nutrition Programme

Figure 1: Disaster Coordination Bangladesh – NC Structure



¹ The cluster works under the Ministry of Health and Family Welfare as the technical ministry; however actual disaster preparedness and response falls under the Department of Disaster Management (DDM). The clusters usually come under the DDM umbrella as part of the humanitarian coordination task team (HCTT).

(>50% time) and support to NC activities and coordination. The NCC is also the focal point for the scale-up of management of SAM and is in charge of nutrition mainstreaming in the field, providing day-to-day technical support and supportive supervision to over 40 field-based nutrition staff.

The NC has been largely funded by ECHO since 2013 with co-financing from UNICEF (annual 2015 budget: 0.5 million USD). UNICEF is funding the sub-national cluster coordination through internal resources. Cluster partner organisations have also contributed staff time in some of the cluster activities.

NC strategy

The NC has six strategic areas of focus, elaborated below:

Nutrition coordination

At the national level, the NC has developed and routinely updates cluster documents, including a “4W mapping” (who, what, when and where), cluster contingency plan, and cluster contact list. The national NC organises monthly cluster and ad hoc meetings, provides orientation on coordination for district-level cluster focal points, supportive supervision during initial meetings, and ongoing technical support and mentoring to government and partners.

The sub-national NC has trained over 300 members of disaster management committees on NiE interventions in 16 disaster-prone districts. The sub-national NC actively supported post-Cyclone Viyaru relief efforts in Barisal and Chittagong divisions in May 2013; nutrition coordination forums were organised and partners were assigned operational areas to avoid duplication of efforts.

Nutrition assessment

In 2013 it was recognised that the lack of a standardised methodology/guideline for implementing small-scale, area-based nutrition surveys was resulting in poor data quality and challenges in comparing assessments and monitoring over time. In response to identified gaps (2013 needs assessment), the cluster organised a training course on the SMART methodology for 17 partner staff. The Rapid Nutrition Assessment Team (RNAT) was subsequently formed, comprised of national staff and housed within Dhaka University’s Institute of Nutrition and Food Science (INFS). The RNAT has since carried out three localised nutrition surveys and has supported other organisations to implement surveys. The team is available for quick deployment to any disaster-affected area to carry out nutrition assessment and individual staff may be hired by agencies. In non-response time, the team has worked to integrate the SMART methodology into the nutrition curriculum for undergraduate students.

The NC has also supported the GoB to develop National Nutrition Assessment guidelines based on the SMART methodology. An Assessment Working Group has been formed to support organisations to conduct quality nutrition surveys.

Nutrition information management

The NC has focused on improving the availability and utilisation of nutrition information. NC advocacy resulted in the establishment of the Nutrition Information and Planning Unit (NIPU) at the IPHN, which saw to the inclusion of standard nutrition indicators in the Health Management Information System (HMIS). District coordination meetings have also contributed to the improved availability of data. Data are published by the NIPU in reader-friendly “nutrition bulletins” (two issues have been printed to date), which are circulated among district and national stakeholders. While this reflects progress, the NC has had limited engagement in overall information management for preparedness in response.

Capacity development

To address training needs identified in 2013, the NC, in partnership with Helen Keller International (HKI) and INFS of Dhaka University, contextualised the Global Nutrition Cluster’s Harmonised Training Package (HTP) for NiE for Bangladesh. This package was then used by INFS and UNICEF to roll out trainings in ten disaster-prone districts and among partner staff at national level. Partners have also used the materials to train staff countrywide. Collectively, more than 400 people have been trained, most of whom are members of district disaster management committees (DMC). The cluster plans to reach an additional 175 partner staff with NiE training and 150 members of DMCs in 2015.

Discussions with other sectors, such as Food Security, WASH (water, sanitation & hygiene) and health, indicate gaps in knowledge on NiE issues. To address this, the NCC has advocated with other clusters to integrate key issues on NiE in their training packages. With support of the IMO, nutrition indicators have been added to the Food Security Cluster’s assessment tool. The IPHN has also integrated NiE in its five-day, basic nutrition training package for frontline government health workers in community clinics and sub-district hospitals.

NiE interventions are now included in the National Nutrition Policy and the national operational plan of the IPHN incorporates NiE as an area of focus. The contextualised HTP has also been incorporated into the government’s basic nutrition module aimed at frontline health workers.

Working with multiple stakeholders and pushing the nutrition agenda has been challenging. Additionally, significant follow-up is required to ensure that the NiE materials incorporated in different areas are utilised in the correct way.

Nutrition programme support

For many years, management of SAM has been led by NGOs due to the absence of nationwide programming within government-led facilities. Due to the geographical focus of NGOs, SAM programming has been limited to pockets in certain districts, despite the relatively even dis-

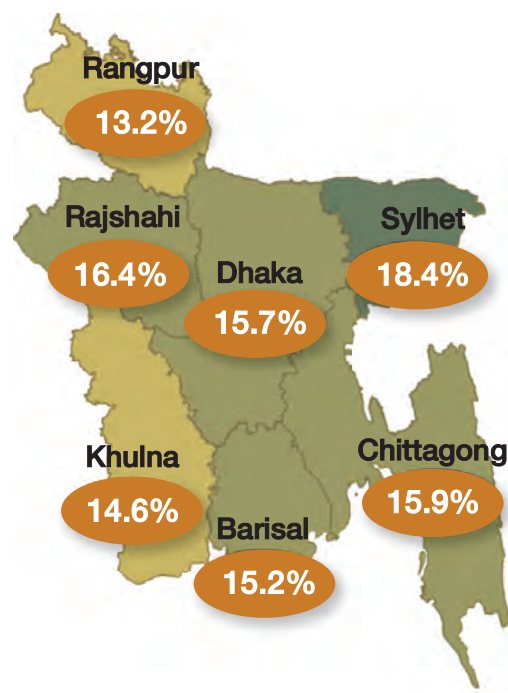
tribution of wasting throughout the country (see Figure 2). The NC has therefore focused on supporting the management of SAM given the high burden in Bangladesh and the extremely limited capacity in this area.

While national guidelines on the management of SAM were approved in 2008 and all districts are now implementing inpatient treatment of SAM (to varying degrees), the Government has yet to approve a strategy for rollout. Additionally, as the GoB does not allow the use of Ready-to-Use Therapeutic Food (RUTF), community management of SAM is impossible. The NC and UNICEF have therefore focused efforts on capacity-building, supply provision and the development of a database for inpatient treatment, while WFP has focused on the management of MAM.

To expand SAM programming, the NC has supported the MOHFW to scale up SAM management through dedicated use of the NCC’s time and the coordination support from the Acute Malnutrition Working Group (AMWG) comprised of the GoB and NGO partners. The AMWG has reviewed SAM management tools and guidelines and implemented a bottleneck analysis (conducted in collaboration with IPHN) addressing identified issues. The NCC reviews monthly SAM reports regularly and provides feedback to implementing teams. The NCC and AMWG also provide ongoing technical support to public health facilities.

At national level, the NC has supported the establishment of a database housed and managed by IPHN. Discussions are at an advanced stage to incorporate the SAM reporting tool in the HMIS. A training of trainers at central level has been conducted and over 1,000 government health workers in 102 hospitals have been pro-

Figure 2: Wasting (WHZ<-2) prevalence at divisional level



vided with on-the-job training in inpatient SAM management. This represents 76% of all hospitals targeted for SAM management (21% of all hospitals in the country). Submission of monthly reports has improved by 50% (from less than 30% to over 80% of facilities submitting reports). Consequently, the number of facilities providing inpatient management of SAM has been scaled up from five facilities at the start of 2013 to 134 by end of 2014.

The main challenges to the scale-up of SAM management include lack of rollout strategy; low capacity of health workers on inpatient management; absence of community-based option due to ban on RUTF importation (government policy) and no local production; health worker motivation to take on the burden of SAM treatment; and regular and accurate reporting.

Work is needed to ensure that performance indicators are maintained at desired levels and capacity development initiatives for health workers continue since the trainings so far have reached a small percentage of health workers. Coverage and access to SAM management services remain low since the community based option is not available, and only about 30% of government hospitals offer services.

Cross-sectoral engagement

The NC actively collaborates with other clusters and humanitarian coordination team activities. In addition to district level work, the national NC has collaborated with the Food Security Cluster on assessment initiatives, including the Integrated Phase Classification (IPC). The NC has supported planning, training, field data collection, analysis and reporting of nutrition surveys, which have fed into the IPC analysis. In collaboration with the IPC, the NC conducted the very first IPC nutrition pilot in 2014 that has provided the foundation and informed subsequent pilots globally. IPC analysis maps have

informed prioritisation of most vulnerable areas for programming and applied in ranking the most needy areas whenever a joint needs assessments (JNA) is under taken. The NC has also engaged actively in the JNA of the HCTT with data collection, reporting and response.

The NC participates in sectorial coordination mechanisms such as the NWG and food security and WASH (water, sanitation & hygiene) clusters. The NC has collaborated with the WASH and Food Security Clusters to develop a joint emergency response plan which was used following flooding in 2013 to channel funding for both WASH and food security interventions.

While UN REACH is represented in the NC, the NC has not had any meaningful interaction with the SUN movement in-country. This is largely due to the fact that SUN architecture is located at a high level within government and at a level where the NC is not represented.

Challenges

Capacity gaps remain. While district nutrition coordination is improving in the 16 target districts, huge technical capacity gaps remain among health workers on collection, analysis and utilisation of data. Many facilities have limited nutrition services and are not reporting nutrition indicators or are not capturing data accurately. Additionally, coordination gaps are evident in non target districts. While there has been considerable training undertaken, it remains to be seen if this translates into actual capacity to respond in a future emergency.

Building preparedness capacity in high burden and high-risk context requires long-term funding. The cluster has received limited funding for its preparedness activities (e.g. capacity-building of DMCs) and thus these have been implemented in a phased manner.

Coverage of SAM treatment is limited due to the lack of community services for managing SAM. Given the huge burden of SAM in Bangladesh, scale-up of outpatient therapeutic services to the community level is necessary.

Sustaining interest in the cluster mechanism and preparedness efforts in a development context is a continuing challenge. The NC does not have influence on funding for disaster/emergency response as is the case in IASC-activated clusters, where there is mobilisation of resources around the costed Humanitarian Response Plan.

Additional funding is needed to sustain and increase sub-national coordination and expand treatment of SAM. UNICEF has been advocating for pooled funds to address these nutrition gaps.

Cross-sectoral engagement and advocacy has been challenging, particularly in the absence of a policy document on nutrition-sensitive actions or a framework on how this could be facilitated.

Learning

Key lessons emerging include:

- The provision of technical support by the NCC to routine UNICEF programming is

time-consuming and has taken priority over the core responsibilities of the cluster. This has resulted in a missed opportunity to build greater emergency preparedness.

- While the NC has built capacity in information systems for nutrition and nutrition assessments, work remains to be done in information management for preparedness.
- While momentum and advocacy for linking emergency and development approaches for nutrition preparedness and programming is building at national level through the UN REACH and SUN movement, guidance documents and a policy framework are essential to forge these links and inform actors involved in nutrition-sensitive programming.
- Leveraging other sectors to implement nutrition-sensitive activities is challenging due to time required and lack of evidence and guidance on how to do this effectively. UNICEF is increasing efforts to engage with the SUN secretariat in Bangladesh to define and address multi-sectoral approaches.
- Sub-national clusters can be effective in co-ordinating a response. As witnessed by the response to Cyclone Viyaru in May 2013 where DNO preparedness activities built the foundation for the coordinated response.
- Partnerships with academic institutions and government bodies can have great benefits in terms of designing and conducting assessments, developing training materials and capacity-building.

Moving forward

Nutrition coordination in Bangladesh is in transition. A deliberate effort is being made to transform the nutrition architecture at country-level to ensure that coordination forums adequately support the Government to strengthen routine nutrition programming. The goal is to establish coordination forums that address routine development programming, preparedness and emergency response. It is envisaged that one coordination forum led by the IPHN and co-led by UNICEF will be set up at national level with a mandate to support nutrition programming. A key focus of this new forum will be increased advocacy for preparedness. Sub-working groups within this forum will address various nutrition issues, such as NiE (currently the NC); Capacity and Learning (currently the Nutrition Working Group); IYCF (currently the IYCF Alliance); and Information Management (currently the Information Management Group). Discussions with the Government and multiple partners are underway to agree on roles and responsibilities in a new structure. The new architecture is expected to be in place effectively by the end of 2016 or early 2017.

For more information, contact: Andrew Sammy, email: asammy@unicef.org

References

UN, 2009. Global Assessment Report, Disaster Risk Reduction.



WFP/Kenneth Witterton



Ukraine

Nutrition coordination in Ukraine

Experiences as a sub- cluster of health

By Anna Ziolkovska



Anna Ziolkovska is the Information Management Officer with the Global Nutrition Cluster Rapid Response Team, UNICEF. She was deployed to Ukraine twice, for a

scoping mission in February 2015 and as a Nutrition Sub-Cluster Coordinator in March-May 2015.

The ENN team supporting this work comprised Valerie Gatchell (ENN consultant and project lead), with support from Carmel Dolan and Jeremy Shoham (ENN Technical Directors). Josephine Ippe, Global Nutrition Cluster Coordinator, also provided support.

This article is a summary of a case study produced in a 2015 collaboration between ENN and the Global Nutrition Cluster (GNC). The full case study is available at www.ennonline.net/ourwork/networks/gnckm.

The documented findings and recommendations are those of the authors. They do not necessarily represent the views of UNICEF, its Executive Directors or the countries that they represent and should not be attributed to them.

Location: *Ukraine*

What we know: Strong coordination and technical capacity to plan, steer and implement programming is necessary in mounting a nutrition response in emergencies.

What this article adds: A case study on nutrition country cluster coordination experiences in the Ukraine was carried out in 2015. Lack of national capacity (government and UNICEF country office) in nutrition coordination and technical knowledge, high turnover of 'surge' staff stop-gapping coordination needs, and limited nutrition and emergencies expertise of partners on the ground greatly impeded the humanitarian response. An early scoping assessment proved a crucial step in understanding the context and raising nutrition profile. IYCF and complementary feeding were the primary nutrition focus with particular challenges around managing non-breastfed infants and micronutrient supplementation; stunting, non-communicable disease, anaemia and the needs of older people were not considered. Amongst donors, nutrition was not a priority in the absence of acute malnutrition; a costed activity plan remains largely unfunded. Key lessons include coordination and information management capacity should be prioritised in UNICEF recruitment and funding processes..

Background

Political unrest began in March 2014 in the Donbas region of eastern Ukraine forcing many people to flee their homes, settling in densely populated urban areas. Violence has escalated significantly since mid-January 2015 with civilian casualties and infrastructure destruction. In August 2015, only MSF was given accredited access by de facto authorities' – other agency activities were suspended.

It is estimated that more than five million people have been affected since the start of the conflict. Over 1.4 million people are officially registered as internally displaced people (IDPs). Approximately two million people living along the conflict line are reliant on assistance and face persistent threats and insecurity.

Impact of the conflict

In conflict-affected areas, basic services have been disrupted and there is need of medicines, food, basic household items and shelter. Reports indicate that many of those remaining in the conflict zone close to the frontline are living in unhygienic, overcrowded, underground shelters with no WASH (water, sanitation and hygiene) facilities and electricity. Limited access to the population has hampered the movement of humanitarian aid.

In non-government controlled areas (NG-CAs), the banking system has collapsed and pensions and social benefits are unavailable. Restriction of movements across the frontline due to the introduction of special permits exacerbates the situation. Many registered IDPs have exhausted their financial resources and face difficulties in paying for accommodation, heating, food and non-food items.

Humanitarian response

The cluster approach was activated on 23 December 2014 and the following clusters were established: Education (led by UNICEF); Emergency Shelter & non-food items (NFIs) (led by UNHCR); Food Security & Nutrition (FS&N), (co-led by WFP and UNICEF); Health (led by WHO); Livelihoods/Early Recovery (led by UNDP); Protection (led by OHCHR/UNHCR); and WASH (led by UNICEF).

A Humanitarian Response Plan (HRP) was developed in November 2014 targeting 900,000 people for humanitarian assistance in the various sectors. Given the deterioration in the situation, numbers were revised in February 2015 to target 3.2 million of the five million estimated to be affected.

Nutrition situation

Based on the available data (mostly 15 years old), pre-crisis stunting and acute malnutrition rates were perceived to be low, while anaemia prevalence was 24.1% nationwide (MoH statistics, 2014).. Poor infant and young child feeding (IYCF) practices existed (MICS 2012), and there are widespread violations of the International Code of Marketing of Breastmilk Substitutes (the Code).

An IYCF-E (Infant and Young Child Feeding in Emergencies) survey conducted by the Centers for Disease Control (CDC) with support from UNICEF¹ in June 2015 found no cases of severe acute malnutrition (as measured by mid-upper arm circumference (MUAC)) and 0.5% moderate acute malnutrition, in under 2's.

The exclusive breastfeeding rate was low (25.5%), 42.4% of mothers stopped breastfeeding without any specific reasons and 30% stopped

¹ Conducted among IDPs in Kharkiv, Dnipropetrovsk and Zaporizhia oblasts by the Centers for Disease Control



Displaced families
living in a railway car
in Sloviansk, Ukraine

due to conflict-related stress. Poor IYCF practices are manifest, with early introduction of non-milk fluids and widespread bottle-feeding practiced by IDPs in eastern Ukraine. Mothers are often told by doctors to give their children water, formula or other complementary foods before six months, with some health providers even offering formula in the birth clinic if the baby cries or is perceived to be hungry. The majority (70.5%) of the families surveyed received baby food in the food basket as part of the humanitarian assistance, while more than half (51.2%) of the families with an infant less than six months received infant formula.

A survey in December 2014 (by People in Need) indicated that 71% of those surveyed regularly face food shortages due to lack of cash to buy food as a result of exhaustion of financial resources, unemployment, lack of access to savings, non-payment of pensions and benefits, increased food prices and rising energy prices. Pensioners, the elderly, the socially vulnerable and people living in active fighting zones and non-government controlled areas (NGCAs) were particularly at risk of food insecurity.

Water supplies are available but are irregular due to the damaged water network. Maintaining water quality is a concern due to lack of access to the main water sources, which are very close to the front line.

Basic health services have been significantly disrupted. At least 32 hospitals in NGCAs are not functioning, while 17 have been shelled and damaged but continue to offer limited care. There are risks of shortages in electricity and water supply in hospitals and lack of fuel for ambulances (ACAPS, 30 January 2015). In addition, between 30 and 70% of health staff have fled the conflict-affected areas of Donetsk and Luhansk oblasts. Low vaccination rates heighten the risk of outbreaks of vaccine-preventable diseases, as evidenced by the outbreak of polio in the west of the country in September 2015.

The drug and medical supply chain have totally collapsed and stocks are depleted. About

71% of people in Donetsk oblast reported having no access to medicine and 85% reported having no access to medical treatment (December 2014, People in Need).

Nutrition sub-cluster coordination

Pre-crisis, the UNICEF programme in Ukraine did not have a strong nutrition component as it was not considered a priority. Health programmes existed but capacity was low. When the cluster approach was activated, the UNICEF Health Specialist assumed the Nutrition Cluster Coordinator (NCC) role but left the position in Jan 2015. To fill the gap in both cluster coordination and technical capacity, the Global Nutrition Cluster (GNC) Coordination Team, in coordination with the Country Office, deployed a Ukrainian-Russian-speaking Rapid Response Team (RRT) member to Ukraine for two weeks (3-14 February) to review the nutrition situation, partner capacity, gaps in response and working arrangements for nutrition coordination (GNC, 2015). Based on the needs identified, the RRT member returned for an additional eight weeks (March to May 2015) to act as the NCC. A Senior Advisor at CDC was also deployed to Ukraine during this time to support design of assessments and provided technical assistance to the Nutrition sub-Cluster.

The RRT member provided coordination support for Ukraine while in the country for a total of ten weeks and provided remote support for four weeks from May-June 2015 via Skype meetings and following up with partners on issues raised during the visits. This focused support resulted in active engagement, follow-up on issues and bringing together of partners.

An Information Management Officer (IMO) employed by UNICEF supported nutrition and WASH coordination, as well as the national UNICEF programmes.

Nutrition coordination

Nutrition coordination was initially included as part of the Food Security and Nutrition (FSN) Cluster. During the scoping mission, the RRT member (acting as an NCC) reviewed the effec-

tiveness of nutrition coordination under the FSC and identified other potential mechanisms to improve nutrition coordination. It was agreed that, while there were advantages for the Nutrition Cluster (NC) to continue as part of the FSC (e.g. this promoted closer engagement with partners on complementary and supplementary feeding programmes and ability to monitor more closely violations of the Code in general ration distributions), there could be significant advantages to shifting nutrition coordination to the Health Cluster, such as:

- Existing systems: the Ministry of Health (MoH) had an existing system/structure and staff that IYCF activities could build on in terms of capacity development.
- Nutrition expertise: many partners in the Health Cluster have nutrition expertise globally which could allow for greater discussion around nutrition issues.
- Funding potential: donors are well represented in the Health Cluster meetings, allowing for a higher profile for nutrition.

Based on these arguments, it was agreed in February 2015 that nutrition coordination would best be supported under the Health Cluster with the Nutrition sub-Cluster providing day-to-day management of the nutrition coordination and holding separate nutrition coordination meetings, yet providing updates to the larger Health Cluster in their meetings. The proposed structure was presented to the Emergency Relief Coordinator who formally approved the Health and Nutrition cluster in Ukraine in February. Based on agreement among partners, the scoping mission recommended revisiting the need for a stand-alone nutrition cluster when developing the 2016 HRP.

To support various technical issues and discussions, the Nutrition sub-Cluster established a Complementary Feeding (CF) Task Force in March and an IYCF Advocacy Task Force (TF) in April. The CF TF fulfilled its aim of designing the composition of the complementary feeding ration and has ended. The IYCF Advocacy Task Force continues to develop advocacy documents (as of November 2015).

WFP/Abeer-Etefa



Food distribution centre where displaced families receive food vouchers, Kramatorsk, Ukraine

After the RRT deployment, UNICEF, as the Cluster Lead Agency for Nutrition, tried to maintain both nutrition programmatic and co-ordination capacities through a series of surge and technical support from UNICEF HQ, other UNICEF offices and CDC. However no dedicated nutrition coordination capacity has been identified (as of November 2015). This has resulted in significant gaps in nutrition coordination and the inability to sustain various efforts of surge staff.

Partners and technical capacity

In addition to the MoH, there are 18 Nutrition sub-Cluster partners including United Nations (UN) agencies (UNICEF, WFP and WHO), nine international non-governmental organisations (NGOs) and five local charity organisations. None have in-country technical capacity in nutrition. The Ukrainian MoH nutrition capacity is limited to the head of the Maternal and Child Health Department and has limited engagement in cluster discussions. Nutrition technical support for WFP was initially provided by the Regional Bureau, although it has recently (September) recruited someone based in Ukraine.

Local organisations are playing an important role in the response efforts. Two very large local charities, Akhmetov Foundation (AF) and Alexander Romanovsky Foundation (ARF), are providing significant amounts of food, medical and social support in affected areas, largely funded by private donors and other governments. Both agencies have extensive local volunteer networks (over 1,000 volunteers in ARF) in affected areas and attend Nutrition sub-Cluster meetings. Other local organisations with no technical expertise in nutrition are also involved in food distribution.

Nutrition response

The 2015 Strategic Response plan (SRP) developed in November 2014 had a very limited focus on nutrition. The only nutrition activity listed was “capacity building on food security and nutrition”. Nutrition was not considered a priority due to the lack of acute malnutrition (at a meeting in Dec 2014, UNICEF Health and Nutrition staff informed partners that no severe

acute malnutrition had been reported and that individuals have a high coping capacity and resilience). Based on gaps identified in the scoping mission, nutrition activities were expanded in the revised HRP (February 2015) to include needs assessments, IYCF support, complementary food support to young children, capacity development (focused on IYCF), continued monitoring of at-risk groups (children under two years, pregnant and lactating women and older people) and advocacy across sectors for a nutrition-sensitive response. Additionally, various assessments were planned/conducted and mechanisms for surveillance of older people and anaemia were proposed.

Food assistance

General distributions² as well as cash and vouchers are being implemented by several FSN cluster partners. In NGCAs, as of August 2015, WFP was distributing general rations to 200,000 food-insecure individuals for three months. Given that no fresh fruit, vegetables or fortified complementary foods for children are being provided, the Nutrition sub-Cluster has advocated the provision of complementary food baskets to young children. WFP has plans to distribute these complementary feeding baskets to 20,000 children aged 6-23 months for six months once funding and access are secured.

Two large local charities continue to distribute food rations to the affected population, involving sophisticated systems for IDP registration, monitoring of IDPs and targeted commodity distribution using text messages and multiple distribution sites. Baby-food baskets have been provided as part of their programmes.

A review of the components of the local charity food baskets during the scoping mission highlighted that breast milk substitutes (BMS) were being distributed alongside food baskets to children of all ages. As a result the Nutrition sub-Cluster Complementary Food Task Force, with support from UNICEF headquarters and WFP RO, developed guidance on the composition of complementary food baskets for children aged 6-23 months, with recommendations to separate complementary food baskets for children

6-11 and 12-23 months (Nutrition sub-cluster, 2015). The Nutrition sub-Cluster is advocating with WFP to disaggregate data to facilitate ease of monitoring of the food baskets going to various age groups.

IYCF

Limited cash reserves and lack of availability of BMS in the market, particularly in the NGCAs, has significantly constrained availability of supplies in a population where use is common and access to safe water and fuel for safe preparation of BMS is limited. Based on the Humanitarian System Monitoring report of December 2014, infant formula was the most highly requested food item by the conflict-affected population. Due to shortages, over-dilution of BMS was practised to prolong use.

The IYCF Advocacy Task Force, in collaboration with IFE Core Group at global level, developed a statement on the promotion of safe and appropriate IYCF practices. The statement was signed by the UNICEF Representative (on behalf of Nutrition Sub-Cluster), the WHO Representative (on behalf of the Health and Nutrition Cluster) and the MoH. It was issued in August 2015. A two-day workshop on IYCF was conducted by the Nutrition sub-Cluster with support from UNICEF HQ for partners and government staff in July 2015.

Micronutrient deficiencies (MND)

It was expected that anaemia prevalence in women and children would increase post-crisis and there are anecdotal reports of 60% anaemia in women in some areas, yet reliable data are not available. In March 2015, the Nutrition sub-Cluster proposed a surveillance system to document monthly reported cases of anaemia in pregnant women and infants from randomly selected health facilities in five priority oblasts in both government and NGCAs. UNICEF field monitors were to collect the data and develop the reports, although the system remains to be established.

Additionally, UNICEF proposed the distribution of multiple micronutrient powders (MMPs) for home fortification in the Nutrition Response Plan; however the product required MoH approval before being imported as it is not registered with MoH. Due to the lengthy process of new product certification in Ukraine, this activity has been dropped.

Nutrition for other vulnerable groups

In addition to children under two years, older people and pregnant women are considered particularly vulnerable groups. The Nutrition Response Plan suggests that some of the needs of these groups might be met through food dis-



Anna Ziolkovska, 2015

² As of February 2015, the WFP food basket consisted of canned beef, canned sardines, noodles, sunflower oil, ground rice, sugar, beans, salt and tea consisting of 2,600kcal per person per day (recommended kcal for winter months). Other partners provide oil, sugar, tea, cookies, flour, pasta, wheat porridge, oat flakes, semolina, buckwheat, rice, canned meat products, sardines in oil, canned sprats, chicken liver paté, cheese, beans, dried peas and tomato paste.

tribution activities of the FSC and social protection activities. It also recognises that the Nutrition sub-Cluster does not have the capacity to directly assess the nutritional status of older people (noted on pages 11-13), although it aims to review results from the nutrition screening of people over 70 in mobile health units conducted by WHO and develop a response if necessary. Additionally, the plan proposes anaemia surveillance for pregnant women. However neither of these activities have been conducted.

Monitoring and information management

An initial plan for monitoring and information management was established in the Nutrition Response Plan. However, as there have been no nutrition-specific programmes, there has been no programmatic information on which to report. While WFP received money for complementary food distribution and has identified partners, this has been halted due to the lack of access to the NGCAs (since August). The 4W (who, what, where, when) sheet was not updated between May and November 2015 due to the absence of a long-term NCC

The monitoring of Nutrition sub-Cluster Coordination performance is planned through a standard Cluster Coordination Performance Monitoring (CCPM) exercise; however a date for conducting the CCPM has not been established.

Funding

The cost of implementing the Nutrition Sub-Cluster Response Plan (February 2015) was estimated at USD 9.5 million, although this does not include funding secured by local organisations such as private foundations. It was costed in anticipation of capacity materialising where funding was available. By February 2015, the Nutrition component of the Health and Nutrition Cluster HRP was zero per cent funded. The

WFP/Abeer Etefa



Food distribution centre where displaced families receive food vouchers, Kramatorsk, Ukraine

RRT member, providing surge support to Ukraine in February, advocated directly with GNC partner agencies to support a nutrition response, while UNICEF HQ, UNICEF Ukraine, WFP HQ and WFP Regional Bureau advocated for funding with donors directly. As of September 2015, USD 4.01 million (mostly for health) has been received against the overall Health and Nutrition HRP. In addition, DFID has provided 600,000 GBP for nutrition (to UNICEF) and WFP has received limited funding for complementary food distribution, but it has not started yet (November 2015).

Challenges

Interviews conducted with a number of stakeholders identified the following challenges in effecting a coherent nutrition response to the Ukraine crisis:

- Nutrition has not been a priority for the humanitarian response given the absence of acute malnutrition. Other nutrition issues (such as anaemia and stunting) are widely considered development issues and the responsibility of government in a middle income country. Links between poor IYCF practices and nutrition/outcome are not clear to donors. A more pressing MoH priority was management of a polio outbreak.
- The areas affected by conflict are on average 9.5 hours (690km) from Kiev, the capital of Ukraine. There is no visible impact on those in the capital and thus it is a relatively 'silent' emergency.
- Nutrition coordination has fallen through the cracks. There is no dedicated capacity for coordination or information management, limited partner capacity, low prioritisation and coordination struggles within the HNC and FSC, and weak national UNICEF capacity. The NCC position remains unfilled 11 months after the identified need. Cross-sectoral coordination and engagement with local NGOs (who are many, with massive reach) has also been hampered as a result
- Lack of both technical nutrition capacity on the ground and experienced international agencies in the immediate response, coupled with high surge staff turnover, has limited progress on the Nutrition Response Plan.
- Lack of product approval from the government meant that MNPs could not be used to improve dietary quality for children.
- There was no guidance on what to do for non-breastfed/BMS-dependent infants. While all partners recognised this was a large challenge, there was limited leadership and authority on the ground (including agencies' headquarter technical nutrition staff) to make recommendations. This contributed to additional confusion among partners and the wider humanitarian community, including donors, and the population³.

At the time of writing (November 2015), the GNC and the UNICEF Country Office are working together to recruit a NCC as soon as possible; however due to lack of funding for a purely co-

ordination position, a Health and Nutrition Specialist position, which combines coordination with UNICEF programme functions, has been advertised. It is questionable how much time this person will be able to allocate to coordination of the emergency nutrition response. In the interim, short-term support staff are still being deployed to cover basic technical and coordination functions.

Lessons learned

The scoping visit was a crucial step in understanding the nutrition situation in Ukraine; it raised the profile of the nutrition situation at national and international level and galvanised support for assessments by INGO partners, including CDC.

Absence of acute malnutrition at the onset of the crisis indicated (incorrectly) to many in-country stakeholders that a nutrition response was not necessary. IYCF and complementary feeding issues attracted most attention, but stunting and NCDs did not.

Older people were a crucial vulnerable group in this context but were not included as a group of concern by the Nutrition sub-Cluster, and so were not reflected in the HCT funding and support requirements.

Future situational analyses should review the range of nutrition issues from the outset, including stunting and NCDs, and consider how a deterioration in other sectors will impact all aspects of nutrition, to guide the development of the response. Strong partner technical capacity is crucial. There remains a question as to how emergency response should address a previously existing chronic problem (poor child feeding practices) pre-conflict.

The Ukraine nutrition response (mainly IYCF support) is largely underfunded (97%), according to the HRP; there remains a lack of implementing partners even in the event of funding being secured. This raises the question as to whether funding requirements for a response should be based on assessed needs or on capacity to implement.

Dedicated coordination and information management support for nutrition is crucial, regardless where nutrition coordination sits, and should be prioritised in UNICEF recruitment and funding processes.

For more information, contact: Anna Ziolkovska, aziolkovska@unicef.org

³ Draft guidance has since been developed in relation to the European migrant crisis and work is underway at a global level to address this further in the coming year.

References

GNC, 2015. Report of the Global Nutrition Cluster Scoping Mission to Ukraine, 3-14 February 2015.

Nutrition sub-cluster, 2015. Key communication messages on IYCF in emergency in Ukraine, Nutrition sub-cluster, 13 May 2015. https://www.humanitarianresponse.info/en/system/files/documents/files/key_messages_iycf_eng.pdf



Care Groups in Emergencies Research Report and Recommendations Guide



Care groups (CGs) and other types of peer support groups are increasingly used in emergency settings to provide different types of support to those affected. International Medical Corps (IMC) received a grant from USAID's Technical and Operational Performance Support (TOPS) Programme to develop a Research Report and Recommendations Guide for the use of Care Groups in Emergencies. Three main emergency stages were distinguished: acute, protracted, and transitional.

Evidence was gathered on the use of care groups (CGs) and other types of peer support groups in emergency settings amongst 11 international NGOs in 14 countries, to analyse their application and develop recommendations. This involved literature review, stakeholder interviews, field visits (Philippines and Ethiopia) and a stakeholder workshop. Reported benefits

of CGs included large coverage, rapid dissemination of information, rapid behaviour change, peer support, trusted communication channel, and provides for a monitoring/screening/referral system. Challenges identified include intensive initial set up, short term funding, programme material development, finding qualified staff and volunteers, population mobility, community sensitisation and issues around monetary incentives. Specific recommendations are made to address implementation, ranging from targeting to meeting length, to volunteer recruitment to formative research.

The full documents can be accessed through the FSN Network Resource Library: <http://www.fsnnetwork.org/care-groups-emergencies-evidence-use-care-groups-and-peer-support-groups-emergency-settings>

Regional Multi-Sectoral Nutrition Strategy Global Learning and Evidence Exchange

In January 2016, SPRING, along with USAID's Bureau for Food Security and Bureau for Global Health, hosted the West Africa MSN-GLIE (Multi-sectoral Nutrition Strategy Global Learning & Evidence Exchange) workshop in Accra, Ghana. Similarly in March 2016, USAID's Bureau for Food Security and Bureau for Global Health, along with the FANTA III project, hosted the East and Southern Africa MSN-GLIE conference in Dar es Salam, Tanzania. A third workshop is scheduled in Asia in June.

Both workshops involved staff from the USAID Bureau for Food Security, Bureau for Global Health, USAID Missions in West Africa (Ghana) or East and Southern Africa (Tanzania), implementing partners, and host country governments who shared their experiences and research, to enable cross-country engagement and improve understanding of emerging concepts.

Experts in agriculture, economic growth, WASH (water, sanitation and hygiene), nutri-

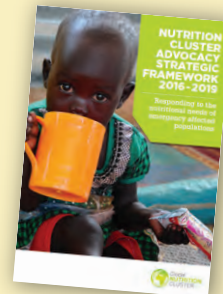
tion, and health programmes gave presentations and led interactive sessions on a range of topics designed to strengthen country-led efforts to improve nutrition. USAID's Multi-sectoral Nutrition Strategy and accompanying technical briefs formed the basis for the agenda. Sessions helped participants identify places where multi-sectoral nutrition programming approaches can be strengthened.

Presentations from the three day meetings are available online at (Ghana): www.spring-nutrition.org/events/multi-sectoral-nutrition-strategy-global-learning-and-evidence-exchange-west-africa-accra and (Tanzania): <http://www.fantaproject.org/news-and-events/fanta-hosts-msn-glee-tanzania>

USAID nutrition strategy: www.usaid.gov/nutrition-strategy

Technical briefs: <https://www.usaid.gov/what-we-do/global-health/nutrition/technical-areas>

Nutrition Cluster Advocacy Strategic Framework and Toolkit



The Nutrition Cluster Advocacy Strategic Framework (2016-2019) and Advocacy Toolkit is now available. The Strategic Framework aims to provide high level overall strategic direction and focus for Nutrition Cluster advocacy efforts to ensure linkages across global and country levels and cluster partners and to support the development of common messages and activities to leverage impact. It is accompanied by a country toolkit, as a practical guide for advocacy. The toolkit provides key questions for reflection, basic advocacy pointers and some advocacy tools to support Nutrition Cluster partners through the different stages of the advocacy cycle with a specific focus on advocacy for nutrition in humanitarian contexts. Previous advocacy experiences from the Nutrition Cluster and its partner organisations are used to illustrate the different areas in which advocacy can work.

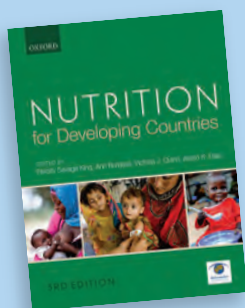
The Strategic Framework (English, French and Spanish) and Toolkit (English) are available at: <http://nutritioncluster.net/advocacy/>

Cluster Guidance for mainstreaming accountability to affected populations

Guidance for Mainstreaming Accountability to Affected Population (AAP) and Core People-Related Issues in the Humanitarian Programme Cycle Through the Cluster System has been jointly produced by the Global Nutrition and Global Food Security Clusters with the support of HelpAge International. It aims to support national clusters to implement their commitments on AAP and core people-related issues both before the beginning of a response (preparedness) and throughout the Humanitarian Programme Cycle. The guidance is accompanied by a Nutrition Cluster Operational Framework on AAP. This framework and associated tools are intended for use by nutrition clusters partners, cluster lead agencies and cluster coordination staff, responsible for policy and programme design, implementation and evaluation. They should be used in conjunction with each agency's own accountability framework, and serve as a bridge between actors and agencies, through the cluster, to negotiate common or collective approaches.

The Guidance (English, French and Spanish) and Operational Framework (English) are available at: <http://nutritioncluster.net/advocacy/>

Nutrition for Developing Countries 3rd edition now available



Nutrition is an essential component of the work of all health and community workers, including those involved in humanitarian assistance. This fully revised and updated third edition of Nutrition for Developing Countries has been prepared by an international team with extensive field experience in Africa and Asia. Using clear, simple language and many illustrations it brings together the essential basics of nutrition in a way which is accurate, up-to-date, and suitable for a wide range of readers.

The book explains nutrients, nutrient needs, meal planning, and how to ensure good nutrition over the life cycle - during pregnancy, infancy and childhood, adolescence, and adulthood, including old age. Emphasis is given to the most vulnerable periods especially the first 1000 days from conception to the second birthday. It addresses the causes, diagnosis, prevention and treatment of undernutrition, and micronutrient deficiencies, as well as overnutrition and obesity. It also covers food and nutrition security, and describes Essential Nutrition Actions including breastfeeding, and complementary feeding. It explains how to work with households and communities so that they can keep well nourished, and manage their nutrition challenges. It gives many ideas for nutrition training. Appendices include recommended nutrient intakes, food composition tables, anthropometric standards, and useful websites.

The paperback is available from Oxford University Press (OUP): full price - UK£34.99 and US\$59.50 + postage- see <https://global.oup.com/academic/product/nutrition-for-developing-countries-9780199685226>.

A 30% discount is available until 31 March 2017 for up to 10 copies to individual (non-trade) customers using the promotional code AMPROMD9. Postage charges/delivery times vary by location. Order online or call +44 (0) 1865 452640 if you need to pay by cheque or postal order. For discounts on orders of more than 10 copies and postal charges, contact richard.church@oup.com.

The paperback is also sold by other distributors (at varying prices) including Teaching-aids At Low Cost (TALC). The e-book is sold by Amazon and other distributors. The online book is available from OUP on annual subscription to libraries and institutions/Pricing varies by size of institution, number of users, etc, see www.oxfordmedicine.com/page/subscribe/how-to-subscribe.

ENN hosted Wasting-Stunting Technical Interest Group meeting

By Tanya Khara, ENN WaSt Project Consultant

On January 29th 2016, the ENN with USAID OFDA and Irish Aid funding convened the second meeting of the Wasting and Stunting (WaSt) Technical Interest Group (TIG) in London, UK. The TIG, comprising approximately 30 experts working on different aspects of wasting and stunting in research, programmes and policy, had been set up in 2014 as part of ENN's project to further understand the relationship between wasting and stunting. This project was born out of previous ENN work which concluded that wasting and stunting tend to be dealt with separately in policy documents, are targeted by separate programmes, funded by different donor and government departments and are the subject of separate research. Answering the question(s) as to whether such a separation is justified, and how it might be bridged for the benefit of the children and families being targeted, has been the focus of the work of the TIG over the last two years. Outputs linked to the TIG have included reviews of available literature (Khara & Dolan 2014) (Briend et al 2014), a research prioritisation exercise (Angood et al. In Press PLOS One) and a panel on the burden of concurrent wasting and stunting in the 2015 Global Nutrition Report¹. General advocacy by TIG members through international fora or local interactions, for the need to investigate and address these two forms of undernutrition simultaneously, has also been ongoing.

The meeting allowed the TIG to take stock of the work to date and discuss the way forward for the new phase (2016 and 2017) of the project. It was agreed that the specific focus for this phase is to answer outstanding research questions identified in 2014-15 and prioritised during a research prioritisation exercise. In the meeting, the TIG identified those questions that might be answered by utilising available cross sectional and longitudinal data.

A number of TIG members presented their data from existing research projects, surveys or programmes (including Demographic Health Survey (DHS) compilations, the REFANI² research project and MALED³ data) and outlined the opportunities these data offer for answering some of the identified priority questions on the relationship between wasting and stunting. Lively group discussion followed. In a number of instances, discussions within the TIG group itself served to identify specific ways that those presenting

data could scrutinise it in order to contribute better to our understanding of the relationship between wasting and stunting. The group also identified a number of concrete opportunities for specific re-analysis of data, in particular from the Medical Research Council programme in The Gambia, and from compiled SMART survey data sets. It was agreed that these two projects would form part of the work plan for sub-sections of the group in 2016-17.

In general, the meeting concluded that there is value in looking into existing data, whilst being cognizant of its limitations. In the longer term, the need to look for funding for simple trials leading on from the findings of such investigations into existing data was highlighted. The TIG also agreed to redraft for submission a viewpoint article on the relationship between wasting and stunting calling for more joined up research, programming and policy.

Finally, the meeting concluded that the inclusion of other individuals/groups who are gathering or utilising related data would be encouraged, as the WaSt-TIG offers a unique opportunity to discuss issues around wasting and stunting from a technical perspective for all stakeholders. Being coordinated by ENN enables a neutral and open space for these discussions to take place.

ENN encourages any organisation or institution with specific analysis/data that you would like to share and discuss with this group to be in touch with the project coordinators, Carmel Dolan (carmel@ennonline.net) and Tanya Khara (tanya@ennonline.net).

References

Khara T, Dolan C. The relationship between wasting and stunting, policy, programming and research implications. Technical Briefing paper. Oxford, UK: Emergency Nutrition Network; 2014.

Briend A, Khara T, Dolan C. Wasting and stunting—similarities and differences: policy and programmatic implications. *Food Nutr Bull.* 2015;36(1 Suppl):S15-23.

Angood C, Khara T, Dolan C, Berkley JA, and the WaSt Technical Interest Group. Research priorities on the relationship between wasting and stunting. *PlosOne.* In Press

¹ <http://globalnutritionreport.org/the-report/>

² Research on Food Assistance for Nutritional Impact. <http://www.ennonline.net/ourwork/research/refani>

³ The Interactions of Malnutrition & Enteric Infections: Consequences for Child Health and Development. <http://mal-ed.fnih.org/>

MAMI Interest Group meeting



On 27th January 2016, ENN, London School of Hygiene and Tropical Medicine (LSHTM) and Save the Children co-hosted a one day meeting of a Management of Acute Malnutrition in Infants under 6 months (MAMI) Interest Group¹ in London. The meeting was funded by Save the Children (Margaret A. Cargill Foundation grant for forwarding Management of Acute Malnutrition in Infants research) and ENN (Irish Aid). Twenty-nine participants represented WHO, UNICEF, UNHCR, CDC, OFDA, DFID, NGOs (Concern, Goal, Save the Children, ACF, IRC), field-based researchers (Malawi, Kenya), research institutions (LSHTM, UCL, Wellcome Trust, University of Tampere, KEMRI, Fogarty International Centre, Aga Khan University), neonatal and obstetric health, and ENN.

The meeting was prompted to facilitate exchange of experiences, policy and research relevant to MAMI, to identify opportunities to engage with reproductive and neonatal health, to share planned activities, and to spotlight emerging research priorities in order that partners can mobilise resources to address these moving forward.

Three presentation sessions (background/epidemiology, interventions and linking and learning with others) were followed by group work to identify priority actions and research. Presentations and research priorities were reviewed to see if they contributed to the top 15 MAMI research questions identified in a 2015 Child Health and Nutrition Research Initiative (CHNRI) MAMI research prioritisation², and the priority WHO research questions for this age group noted in the WHO Guideline on Updates on the Management of Severe Acute Malnutrition in Infants and Children released in 2013³.

Overview of presentations

A WHO update on the status of MAMI related guidance & training, reinforced important initiatives to engage with including an Integrated Management of Childhood Illness (IMCI) Strategic Review planned for early 2016.

Secondary analysis of DHS data identified risk factors for acute malnutrition in infants <6m as household sanitation, maternal education, maternal nutrition, domestic violence, antenatal care practices and early breastfeeding practices.

Operational research findings were shared from Bangladesh (Save the Children), Malawi (LSHTM) and Kenya (KEMRI clinical trial). An important research initiative currently being pursued is the Improved Breastfeeding Support to Treat Acute Malnutrition amongst Infants under 6 months (IBAMI) research, that is planned for inpatient and community (follow-

up) settings in Kenya. It aims to experiment with different approaches of home-based counselling (intensive/less intensive), borrowing approaches from mother-to-mother community support groups, which are working well in Kenya, and bring these into the clinic setting. The aim is to try to optimise breastfeeding as far as possible and see outcomes result.

Experiences of integrating infant screening (using MUAC) and programme admissions into operational settings were shared by GOAL from Ethiopia and with GOAL's GOAL's multi-country Nutrition Impact & Positive Practice (NIPP) Circle project.

An updated review of SAM treatment national guidelines reflected that community-based management of malnutrition in infants < 6m is not yet reflected in national protocols (one exception out of 46 national protocols). An overview of the C-MAMI Tool was presented. This ENN/LSHTM led initiative involving a peer review group of practitioners and experts, developed as a simple, first step stop-gap to help operationalise the 2013 WHO guidance regarding community based management of uncomplicated infants <6m.

Synergies and common ground between MAMI and both the Every Newborn Action Plan (www.everynewborn.org) and Intergrowth and INTERBIO-21st study (www.intergrowth21.org.uk) emerged in presentations and discussion.

Ongoing body composition research in Ethiopia is taking a fresh look at anthropometric criteria, looking to improve understanding on relations between growth and disease risk through life. An emerging hypothesis from this work is that MUAC reflects growth (nutritional vulnerability) while WLZ more closely reflects nutritional status.

Priority actions and research

Top priorities identified were:

- WHO should review the evidence base for the case definition of SAM in infants < 6m, with particular consideration to its association with the risk of death. Currently, weight-for-height (WHZ) is the sole anthropometric diagnostic criterion for SAM in children under 6 months. The possible use of MUAC and WFA and the need to keep WHZ as diagnostic criteria to identify high risk children should be critically reviewed. Existing evidence and further analysis of existing data could be made available to the review process. (*MAMI CHNRI research priority 1*).
- Pilot of breastfeeding interventions that target SAM infants <6m. Piloting the C-

MAMI tool was specified as a top priority. This supports the proposed IBAMI research. (*MAMI CHNRI research priorities 3, 4, 7*).

- There is a large gap in knowledge and associated interventions around maternal nutrition. In the context of MAMI, investigation of the impact of maternal supplementation when pregnant and when lactating is a priority. (*MAMI CHNRI research priority 28, 29*).
- More funding for MAMI research is needed; researchers are encountering significant challenges in securing adequate resources.

Second level priorities identified were:

- Update guidance and protocols, with specific reference to case definitions (*MAMI CHNRI research priority 1*).
- Research into recovery and outcomes amongst treated infants <6m, including post-discharge (*Research need not identified in MAMI CHNRI*).
- Research into risks and benefits of early complementary feeding in the context of SAM infants aged 4-5 months (*WHO priority research question; MAMI CHNRI research priority 58*).
- Research into the role of social/cash/non-food, psychosocial support interventions in MAMI (*MAMI CHNRI research priorities 20, 43*).

The meeting report is available online and presentations are available on request. For more information, contact: Marie McGrath, ENN, email: marie@enonline.net. Visit <http://www.enonline.net/ourwork/research/mami> for MAMI updates.

Since 2015, a 'MAMI' thematic area has been operating on en-net to support those working with this age group. Visit www.en-net.org to view and participate in discussions.

¹ The MAMI Interest Group is an informal network of researchers and practitioners involved in the care of nutritionally vulnerable infants under 6 months and their carers, coordinated by ENN.

² Angood C, McGrath M, Mehta S, Mwangome M, Lung'aho M, Roberfroid D, et al. (2015) Research Priorities to Improve the Management of Acute Malnutrition in Infants Aged Less Than Six Months (MAMI). *PLoS Med* 12(4): e1001812. doi:10.1371/journal.pmed.1001812

³ WHO, 2013. Updates on the management of severe acute malnutrition in infants and children. Guideline



En-net update

By Tamsin Walters, en-net moderator

Over the past four months (1st Feb to 19th May, 2016), 49 questions have been posted on en-net, generating 158 responses. Fifty-three vacancy announcements have been posted, which have accumulated over 13,000 views; and six upcoming trainings. Fifteen questions and notices have been posted on the in Scaling Up Nutrition (SUN) en-net, with 35 responses. Discussions have included examination of what makes a nutrition champion; how to galvanise political support for nutrition in SUN countries; and exploration of funding mechanisms for SUN Civil Society Alliances.

A discussion in the Urban Programming area of en-net focused on progress in developing a nutrition survey methodology for urban areas. While a variety of efforts are ongoing, there is as yet no approved standard approach. The World Food Programme (WFP) has been researching urban sampling methodology as part of the joint Global Food Security Cluster and WFP/VAM led project, Adapting to an Urban World. Examples of approaches include the use of remote sensing and satellite imagery to develop sampling frames in Mogadishu (UC Davies), www.pages.ucsd.edu/~jdriscoll/Methods_files/J_Surv_Stat_Methodol-2014-Driscoll-jssam_smu001.pdf; WHO using Google earth images to develop a sampling frame in Lilongwe (WHO), www.ncbi.nlm.nih.gov/pmc/articles/PMC4208578/; and the Jordan Emergency Services and Social Resilience project (JESSRP), which used population density mapping to identify dense populations and then selecting areas (GPS points) at random to allow for random sampling (REACH), www.reachresourcecentre.info/system/files/resource-documents/reach_jor_report_jordan_emergency_services_and_social_resilience_project_base-line_study_may_2015.pdf

The use of up to date satellite imagery can allow for identification of recent informal settlements. If satellite imagery or other mapping techniques can be used to identify more vulnerable areas of a city (areas of focus), it may be possible to send enumeration teams to the areas to conduct a household count within all target neighbourhoods prior to a survey.

UNHCR has recently developed an addendum to its Standardised Expanded Nutrition Survey (SENS) methodology for out-of-camp settings, [http://sens.unhcr.org/intro-](http://sens.unhcr.org/intro-duction/)

[duction/ out-of-camp-sens/](http://sens.unhcr.org/intro-duction/) to address the particular problem of measuring malnutrition among refugee populations in such contexts, including urban situations. The addendum proposes a variety of different methodologies depending on the context.

In response to questions about calculating household food consumption score (FCS) and its relationship with nutritional status of young children, WFP reported a recent update to its FCS guidance, dated November 2015. This includes eight standard food groups, plus 'condiments' which are not included in the calculation and is available here: www.documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp271449.pdf

In addition, WFP has developed the FCS-N to analyse nutrient adequacy of food groups consumed at household level, which requires adding seven sub-groups to the standard FCS. Experience with its use so far has yielded very interesting results. The guidance can be found at: <https://resources.vam.wfp.org/node/87> or www.documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp277333.pdf

Finally, en-net collaborated with the Sustainable Sanitation Alliance (SuSanA) forum in April to encourage the nutrition community to take part in a technical discussion on

Water, Sanitation and Hygiene (WASH) and nutrition. The specific issues under discussion were:

- 1) How are water, sanitation, hygiene issues addressed in nutrition interventions (WASH in Nutrition approach) at both household and community levels?
- 2) Where do you see advantages and where disadvantages in a one-way integration and a two-way integration of WASH and nutrition?
- 3) Approaching WASH and Nutrition in the development context and in the emergency context - where do you see the major differences?
- 4) How does advocating for nutrition differ from advocating for WASH & Nutrition integration?

A link to the discussions is available at www.forum.susana.org/forum/categories/243-the-matic-discussion-7-linking-wash-and-nutrition-acfgiz-march-2016. A summary of the consultation will shortly be shared on en-net.

To join any discussion on en-net, share your experience or post a question, visit www.en-net.org.uk. To go directly to SUN en-net, visit: www.en-net.org/sun

Contributions from AS, Charulatha Banerjee, Kathryn Ogden, Jona Toetzke and Caroline Wilkinson.

En-net forum now available in French

By Tamsin Walters, en-net moderator

ENN are delighted to announce that en-net is now available in French at: fr.en-net.org. The English and French en-net sites are not duplicate forums but mirror images of each other – the same discussions appear on both sites.

How it works

To maintain the promptness of getting posts online and fluidity of discussions, content that is posted on the English site is immediately translated to French by automatic translation to appear on the French site. Similarly, any questions or answers posted on the French site are immediately auto-translated to appear on the English site. Recognising that automated translation has limitations, there is an additional facility where any en-

net registered user can flag that a posting requires a manual translation review; an en-net translator is on standby to review and improve the text.

How to receive posts in French

You can now choose to receive posts in English or French – simply go to your profile on www.en-net.org and click on your preferred language. If you are not a registered user, it is simple to sign up at the same link.

As usual, we welcome any feedback on the new French facility and the en-net site in general. Please share widely with your French-speaking colleagues.

Maximising the nutritional impact of humanitarian food assistance – ECHO Desk review

Summary of review¹

In 2013, an 'Evaluation of European Commission integrated approach of food security and nutrition in humanitarian context' (Harver et al, 2013) highlighted key constraints of humanitarian food assistance (HFA) actions funded by DG ECHO in the consideration of nutritional needs of specific groups. A desk review was therefore commissioned from the Inspire Consortium² to map existing documents and tools relevant to maximising the nutrition component and outcomes of food assistance, evaluate their technical relevance and validity and to conduct a gap analysis.

Methods

The review considered resources relating to conditional and unconditional in-kind and cash/voucher transfers and resources relating to maximising the impact of programmes on nutritional status, including those of other sectoral interventions where appropriate. Resources were obtained from various stakeholders including UN agencies, ICRC and IFRC, NGOs, donors, academic bodies and think-tanks. Documents were evaluated and scored according to their coverage of a range of nutrition-sensitive elements. All emergency-related documents were evaluated for their reference to Sphere Standards or not. A variety of stakeholders also provided feedback on key constraints relating to achieving nutritional impact in HFA interventions. A detailed report has been produced in addition to a spreadsheet which outlines the coverage of the various nutrition-sensitive criteria by each resource reviewed. An inventory and

short synopsis of each document reviewed has also been created.

Summary of key findings, conclusions and recommendations

In terms of coverage of nutrition-sensitive criteria selected for the review, the highest scoring documents were: USAID's Multi-Sectoral Nutrition Strategy (2014); ACF's Nutrition Security Policy (2014); Save the Children / UNHCR's Infant and Young Child Feeding (IYCF) Friendly Framework (draft, 2015); ACF's Maximising the Nutritional Impact of Multisectoral Interventions (2011); ACF's Emerging Best Practice in Fresh Food Vouchers (2012); and FAO's Social Protection and Nutrition (draft, 2015).

Key gaps identified in policy and strategy resources reviewed included: the limited number of documents referring to Sphere HFA Standards (2011); limited reference to monitoring/minimising potential negative impacts of HFA; low coverage of issues of women's empowerment; limited reference to access to / coverage of interventions.

Key gaps identified in HFA guidance resources reviewed included: lack of reference to Sphere HFA Standards in cash transfer guidance; a lack of consensus on criteria to assess impact on nutritional status of emergency interventions and on how achievement of objectives should be measured. Other areas with limited coverage in guidance included: consideration of baseline/current IYCF practices; provision of nutritional supplements for specific groups, evaluation of outcomes relating to improved care practices

and mortality, consideration of cost-effectiveness /efficiency of nutrition-sensitive interventions.

A very significant gap was noted in relation to guidance on nutrition and cash-transfer interventions in particular, including: lack of consideration of specific nutritional needs of vulnerable groups and a lack of guidance on protection/promotion of IYCF.

Stakeholder feedback highlighted the increasing 'disconnect' between nutrition and food security sectors and the decreasing dissemination, awareness and use of technical guidance and standards relating to nutrition in food assistance programming.

The review suggests the following recommendations to ECHO in particular, but by extension also pertinent to other donors and agencies:

1. Identify key principles for nutrition in HFA programming and an associated checklist.
2. Identify and adopt basic rules/standards relating to Maternal and Child Nutrition and HFA programming.
3. Promote and facilitate increased engagement and participation of the nutrition sector in HFA programming, particularly cash-based programming.

References

Haver K, Harmer A, Taylor G, Khara Latimore T. (2013). *Evaluation of European Commission integrated approach of food security and nutrition in humanitarian context*. 10 July 2013. http://ec.europa.eu/echo/funding-evaluations/evaluations/thematic-evaluations_en

Brown R, Khara T. (2015). *Maximising the nutritional impact of Humanitarian Food Assistance*. Inspire Consortium. November 2015

¹ Brown R, Khara T. (2015). Maximising the nutritional impact of Humanitarian Food Assistance. Inspire Consortium. November 2015

² <http://www.urd.org/INSPIRE-consortium-Policy>

Update on guidance on infant and young child feeding in emergencies underway

The Infant and Young Child Feeding in Emergencies (IFE) Core Group is an established collaborative effort that develops guidance and resource material, documents lessons learned and builds aspects of capacity on IFE. Current members include United Nations agencies, international non-governmental organisations (NGOs), networks and expert individuals, coordinated by ENN.

In 2001, the IFE Core Group developed the Operational Guidance on infant and young child feeding in emergencies (OGIFE), a key policy guidance on the feeding-related needs of breastfed and non-breastfed infants and young children in difficult contexts. Endorsed in a 2010 World Health Assembly Resolution (WHA23.23), it has positively influenced agency policies, guidance, training materials and humanitarian action (it is the basis of Infant and Young Child Feeding

Sphere Standards (2011)). Its content is informed by research, normative guidance and programme experiences and challenges.

The current version of the OGIFE was produced in 2007 (an addendum update was added in 2010). Since then, there have been significant developments in technical guidance (e.g. HIV and infant feeding), the humanitarian architecture (e.g. evolution of the cluster approach) and new experiences and lessons from emergency responses. While the core principles and provisions of the guidance remain valid, the need to update the IFE-OG has become clear. An update is now underway by the IFE Core Group, co-led by ENN and UNICEF and funded by OFDA. An IFE Core Group meeting in February 2016 established editorial and review process and agreed topics for update that include addressing the needs of non-breastfed and breast-milk-

substitute (BMS) dependent infants at scale; meeting complementary feeding needs in high burden contexts; multi-sectoral roles and responsibilities; HIV; and infant feeding considerations in infectious disease outbreaks. Contributions and reviews will be invited across sectors, subject experts and country-based practitioners. The new version should be available by the end of 2016.

If you would like to contribute your experiences of using the OGIFE, please contact Marie McGrath, email: marie@ennonline.net. The current OGIFE is available in 14 languages; we welcome offers of support to translate the new version. For more information on the IFE Core Group, visit: www.ennonline.net/ifecoregroup



ENNs knowledge management project in support of the SUN Movement

By Tui Swinnen

Tui Swinnen is the Global Knowledge Management Coordinator at ENN

In early 2015, ENN began work on a five-year project to support Knowledge Management (KM) for the Scaling Up Nutrition (SUN) Movement under a DFID-funded Technical Assistance for Nutrition (TAN) programme. The programme is designed to support countries to seize the opportunity presented by the favourable political environment that has been created for nutrition globally and to maximise the benefits of membership of the SUN Movement. The Micronutrient Initiative (MI) is also funded under the TAN and aims to deliver technical assistance support to countries within the SUN Movement. With the SUN Movement now in its second phase (2016- 2020), TAN partners will provide ongoing technical and KM support to actors involved in scaling up nutrition.

ENN's KM work will focus on supporting actors within SUN countries to identify knowledge gaps, strengthen evidence on effective nutrition scale-up, and share know-how among actors involved in multi-sector programming and policymaking. ENN will pay particular attention to countries within the SUN Movement that are fragile and conflict-affected, recognising the unique challenges faced in these contexts. Furthermore, ENN will harness the opportunity to improve knowledge-sharing and coordination between actors in both humanitarian and development nutrition sectors that often exist side by side in fragile and conflict-affected contexts.

Field Exchange will be an important vehicle for SUN related KM over the coming four years and will capture the more detailed and technical learning coming out of countries in the SUN Movement, as well as at the global level.

Progress to date

ENN has undertaken extensive consultation with a wide range of stakeholders and regional scoping visits to Somalia, Kenya, Ethiopia, Zambia, Senegal, Myanmar, India, Bangladesh and Laos to understand the status of the SUN Movement in these countries and their KM needs. A dedicated team of KM specialists has been assembled to lead the KM work with a Global Coordinator based at ENN's sub-office in London. Three regional KM specialists are based in east/southern Africa, west/central Africa and in south Asia. The regional KM specialists bring extensive experience in the nutrition sector and involvement in the SUN Movement at country and regional levels, as well as strong networks in their respective regions. The ENN KM team will develop a thorough understanding of knowledge needs at country and regional levels within the SUN Movement and will foster intra- and inter-regional learning and exchanges. In addition to using existing ENN networks, publications and platforms, including en-net, Field Exchange and Nutrition Exchange, ENN will develop new tools and approaches for KM in order to meet the needs of actors involved in the SUN Movement at the national and sub-national level, i.e. more digital content and interactive online spaces to improve networking among country level actors and the capture and exchange of learning and know-how.

ENN will continue to expand its audience and network, engaging actors involved in scaling up nutrition from all sectors and networks, which will bring new voices, perspectives and lessons on scaling up nutrition to help strengthen the SUN Movement and the scale-up of nutrition. ENN will also ensure key KM-related materials are translated into the languages needed in order to reach out to new audiences at national and sub-national levels.

For more information, please contact Tui@enonline.net and follow us on Twitter @TuiSwinnen and @ENNOnline.

Linking agriculture and nutrition education for improved young child feeding



The final report of the Technical Meeting on Linking agriculture and nutrition education for improved young child feeding is now available. The meeting was jointly convened by FAO and the Justus Liebig University (JLU) Giessen, Germany and held at the FAO headquarters in Rome, Italy on 6–8 July 2015.

The report consists of two parts:

- Part I: Technical Meeting Report (meeting proceedings)
- Part II: Programme Lessons (integrating nutrition education and agriculture for improved young child nutrition)

The Programme Lessons were developed to include the main lessons and good practices identified at the July meeting. FAO subsequently revised these through a consultative process with a smaller group of meeting participants to reflect the experiences of practitioners and researchers from a range of agriculture-nutrition education interventions in Africa and Asia.

For more information, contact: Ellen Muehlhoff, FAO, email: Nutrition-Education@fao.org Website: <http://www.fao.org/food/en/>

Part I - Technical Meeting Report

<https://knowledge-gateway.org/?156lfqnm.r5.cxxb33>

Part II - Programme Lessons

<https://knowledge-gateway.org/?156lfqnm.dc.r6ystl>

Issue 6 of Nutrition Exchange now available



The sixth edition of ENN's publication, Nutrition Exchange, is now available in English, with French, Arabic and Spanish editions coming soon. Nutrition Exchange contains short, easy to-read articles on nutrition programme experiences and learning, from countries with a high burden of malnutrition and those that are prone to crisis. It also summarises research and provides information on guidance, tools and upcoming trainings in nutrition and related sectors.

Issue 6 features 13 articles, most of which are written by national actors. There is a focus on learning and experiences from the Scaling Up Nutrition (SUN) Movement, including interviews with key SUN Movement actors in Somalia and Kenya, as well as articles from Niger, Democratic Republic of Congo and Chad highlighting the practical challenges at the national level with the prevention and treatment of wasting. An article from the Americas, highlights how the Latin America and Caribbean Nutrition Clusters are working together and using a tool for the standardised definition and monitoring of regional and national nutrition preparedness and response capacity in a context with recurring natural disasters.

Content is being sought for Issues 7 and 8 (due out in early and mid 2017) on nutrition-specific and nutrition-sensitive programming, governance, coordination and financing. Articles written by national and sub-national actors are prioritised for publication and editing support is provided.

Please contact Carmel Dolan, Nutrition Exchange Editor, carmel@enonline.net

Issue 6 (and previous editions) are available at: <http://www.enonline.net/nex>

By Titus Mung'ou



At the time of writing, Titus Mung'ou was the Advocacy and Communications Manager at Action Against Hunger

(ACF) and the outgoing Chair of Kenya's Scaling Up Nutrition Civil Society Alliance (SUN CSA). He holds a degree in Education (Arts), Postgraduate Diploma in Mass Communication, Masters in Communication Studies, and is currently pursuing a PhD in Communications Studies at the University of Nairobi.

Group work during a media training workshop



Transforming media coverage of nutrition in Kenya

Location: Kenya

What we know: Kenya joined the SUN Movement in November 2012. While Kenya is on course to meet all the World Health Assembly maternal and child nutrition targets, malnutrition remains a significant public health problem.

What this article adds: In Kenya, the SUN Civil Society Alliance (SUN CSA) has engaged in targeted and innovative advocacy to elevate the status of nutrition in government structures, mainstream nutrition as a multi-sector development agenda, and increase nutrition resources (budgets and nutritionists). SUN CSA activities have included development of county-integrated development plans and budgets, nutrition position papers, and establishment of a network of nutrition-interest journalists. Workshops have sensitised political leaders, civil servants, nutrition stakeholders and journalists on their role in SUN. Advocacy impact has included development of specific budget lines for nutrition programmes in county plans, more county nutritionists employed, more quality media coverage on nutrition issues, including the Global Nutrition Report 2015 launch, and commitment of high-level nutrition champions.



Kenya joined the global movement for Scaling up Nutrition (SUN) in November 2012, thereby committing to addressing malnutrition at scale in a multi-sector approach. To date, Kenya has established six SUN networks, namely Government, United Nations, Donor, Business, Civil Society and Academia. These are harnessing various efforts to meet SUN Movement objectives. The Global Nutrition Report 2015 recognised Kenya as the only country on course to meet the 2025 World Health Assembly (WHA) targets. It notes: "Nearly every country (70 of the 74 for which data exist) is on course to meet at least one of the five global targets. This breadth of performance is good news. However, only one country (Kenya) is on course to meet all five WHA maternal and child nutrition targets, and only four (Colombia, Ghana, Vanuatu, and Vietnam) are on course to meet four targets." (Global Nutrition Report 2015).

Country situation

Kenya faces the double burden of malnutrition: undernutrition (i.e. stunting, wasting and micronutrient deficiencies) and overnutrition (i.e. overweight and obesity). Although prevalence of undernutrition (and often associated infectious diseases) remains high, there is a considerable concurrent rise in overweight and obesity rates (and associated non-communicable chronic diseases (NCDs)). While some progress has been

made over the last years in reducing stunting, the vast majority of regions are still not on course. Currently 26% of children under five years of age are stunted and 11% are underweight, while 4% are wasted. Stunting rates are similar for boys and girls; however there are regional disparities, with the highest level of stunting being in West Pokot, Kitui and Kilifi. Stunting remains more prevalent in the poorest households, although it still exists in the richest.

The estimated number of children under five who are overweight is growing rapidly; the current obesity prevalence is 4.6%. One third (33%) of women of reproductive age are overweight. According to the Kenya Demographic Health Survey 2014 (KDHS 2014), overweight increases with household wealth. Being overweight and obese are considerable risk factors for NCDs such as hypertension, diabetes and cardiovascular diseases. Micronutrient deficiencies (including vitamin A, iron, iodine, zinc and folic acid) are common among women and children, and ensuring adequate micronutrient status in women of reproductive age, pregnant women and children improves the health of expectant mothers and the growth, development and survival of their children.

Mobilising civil societies

The SUN Civil Society Alliance (SUN CSA) has three main issues in focus: advocacy to elevate the status of nutrition in government structures,

mainstreaming nutrition as a multi-sector development agenda, and increased nutrition resources (budgets and nutritionists). Two years after its establishment, the SUN CSA has mobilised 44 organisations at national level and 30 others at county level to join the network and advocate for scaling up nutrition. Most CSA members are non-governmental organisations (NGOs) and civil society organisations (CSOs), working in humanitarian, human rights, education, health, consumer and women's empowerment sectors.

Over the last year, members of SUN CSA have been involved in the development and review of county-integrated development plans and budgets, with a specific focus on health and nutrition components. Kenya's 2010 Constitution established 47 counties, which are responsible for policy decisions and allocation of resources to institutions in their jurisdiction. Following continual advocacy by SUN CSA and partners, at least five counties have created specific budget lines for nutrition programmes and employed more nutritionists in the 2015/16 financial year. The counties are Baringo, Taita Taveta, Kajiado, West Pokot, Wajir and Mandera.

The CSA has developed and presented six position papers on various nutrition issues. These include the Draft Kenya Health Policy 2014-2030 and Health Bill 2014; identified and sensitised over six county nutrition champions. The network is supporting the SUN Government

Focal Point and nutrition sector actors to disseminate the National Nutrition Action Plan, develop County Nutrition Action Plans and a national Nutrition Advocacy, Communications and Social Mobilisation Strategy. These activities are vital in promoting the country's nutrition agenda.

With support from the SUN Multi-Partner Trust Fund (MPTF), Population Reference Bureau (PRB), ACTION Global Health Advocacy Partnerships and individual members, SUN CSA has conducted 11 nutrition advocacy trainings and workshops in nine counties. The workshops have served as platforms to sensitise political leaders, civil servants, nutrition stakeholders and journalists on their role in SUN.

Nutrition visibility in the media

The goal of SUN CSA is to place nutrition on both the media and political agendas in order to increase funds for nutrition and to mobilise communities to embrace good nutrition practices. In Kenya, the role of the media in influencing policy decisions on health and nutrition is very important. Through the media, the public is sensitised on good nutrition, malnutrition cases, benefits of eating locally produced nutritious foods, exclusive breastfeeding and baby-friendly facilities, among other issues. Members of Kenya's SUN CSA support the Ministry of Health to ensure media coverage of nutrition events (almost 100 per cent media coverage), with some participating in media talk shows and discussions on topical issues.

Although the impact of the media on nutrition policies and achievement of WHA targets has not been studied, the catalytic role of the media in six counties targeted by SUN CSA resulted in more allocation of resources to nutrition. Sustained media advocacy and press articles on the need for more funds for nutrition was undertaken during the budgeting process, thereby influencing key decision-makers to act. Due to limited funds for media advocacy, sensitisation of journalists in the remaining 41 counties of the country remains a tall order, but is necessary to build capacity to push on key nutrition issues. Using local media benefits and influences both the public and the decision-makers who rely on the stations for their daily news.

Building capacity of journalists

Informed by recommendations from previous media workshops, SUN CSA organised national and county-level media trainings targeting journalists specialising in health and nutrition reporting. The aims were to sensitise journalists on nutrition programmes in Kenya and their role in SUN, to build journalists' capacity to report nutrition stories, and to strengthen the relationship between media practitioners and nutrition experts.

A national media workshop conducted by SUN CSA in February 2015 brought together nine journalists and three Community Health Workers (CHWs) from Nairobi and Embu counties. The journalists were drawn from the Nation Media Group, Kenya Broadcasting Corporation,

Standard Group, Science Africa and freelancers. Topics covered included introduction to the SUN Movement; Kenya's nutrition landscape and nutrition policy framework; and nutrition as a media agenda. The facilitators were drawn from the SUN CSA and Media for Environment, Science, Health and Agriculture (MESHA) (see www.meshakenya.org). Subsequently, with evidence and recommendations from media workshops conducted at the national and county levels, SUN CSA trained more than 25 journalists based in rural areas on nutrition reporting in May 2015. While a science reporters' network in Kenya exists, most journalists in the network do not have the skills to cover nutrition activities. Thus the key outcome of the SUN CSA county nutrition advocacy workshop in May 2015 was the establishment of a network of journalists interested in reporting nutrition stories. Members began a social media group (WhatsApp group: Nutrition Journalists) to share nutrition stories, alert each other on upcoming events and seek comments from experts on technical issues. At least three members of SUN CSA guide discussions on the social media platform.

Key recommendations from the media workshops conducted by SUN CSA include:

- *Mobilise funds for research and fieldwork logistics to enable journalists to write quality stories.* As a follow-up, CSA supported 15 journalists to cover nutrition stories in June 2015 in Baringo, Kajiado, Machakos and West Pokot counties. As a result, there was extensive reporting of nutrition stories in digital and print media. Major TV stations like Citizen, Nation and Kenya Television News (KTN) aired human-interest stories on nutrition, reported by the trained journalists. Most of the journalists submitted more than six stories within the month to their media stations. Besides improved quality of nutrition stories in the media during the period, the number of nutrition articles reported in the media increased from June 2015, according to Media Monitoring Report. To date, the journalists continue to report nutrition stories and often promote specific nutrition agendas when interviewing decision-makers in counties (see Box 1 for selection of articles generated).
- *Establish nutrition database accessible to journalists.* The Nutrition and Dietetics Unit and partners working on the Advocacy, Communication and Social Mobilisation strategy are providing technical support to and documentation of best practices (see www.nutritionhealth.or.ke).
- *Build the capacity of journalists to cover nutrition case studies and surveys.*
- *Establish social media accounts to enhance sharing of nutrition news.* The Nutrition and Dietetics Unit social media accounts have been revamped and provide timely information on nutrition.
- *Initiate a competition for journalists reporting nutrition stories.*
- *Sensitise media editors on nutrition issues in order to increase nutrition coverage (see Box 2).*

Nutrition visibly in the media

A media visibility study conducted by media monitoring firm Reelforge covering the period May 2014-May 2015, commissioned by SUN CSA in June 2015, found that: "Media coverage on nutrition related issues was highest on radio in terms of frequency during the period. This was attributed to the high number of outlets/channels. Television had the highest share of advertising for nutrition products and services value equivalents [value of non-advertisements on nutrition, e.g. news and feature stories, whose value is calculated using advertisement rates] despite a lower number of (nutrition) stories compared to other media types."

Recommendations from the media visibility report included:

- Nutrition actors should push for more coverage by regional and rural radio stations in particular to help address the malnutrition situation in the country, especially in areas most affected by malnutrition such as West Pokot and Turkana counties. This aims to encourage demand for health facility services and support adoption of optimal feeding practices. Current media coverage is skewed to urban areas.
- Increase efforts to profile nutrition stories in major media channels, such as television and print (newspapers) targeting key decision-makers in the country. Media sensitisation of leaders is expected to influence their decisions on development plans and budgets relevant to nutrition.
- Research findings on nutrition issues attract high media interest and coverage. Nutrition actors should support or partner with research firms to conduct nutrition surveys and inform the public regarding malnutrition trends in the country. Such data will act as evidence for planning and budgeting purposes.
- Most advertisements cited by the media as nutrition items were largely promotion of 'nutrition' products by herbalists; sensitisation on what constitutes good nutrition is needed.

Box 1 Links to media articles produced by journalists trained by SUN CSA

KTN TV – Malnutrition in West Pokot County (click minute 25 to watch)
www.youtube.com/watch?v=hVxdaw8vYI

K24 TV – Malnutrition in West Pokot County (link yet to be uploaded).

KTN TV – Malnutrition in Kajiado County
www.standardmedia.co.ke/ktn/video/watch/2000094733/-jamii-ya-isinya-kuhamasishwa-kuhusu-vyakula-muhimu-kwa-watoto

The Star Newspaper – Malnutrition in West Pokot County
www.the-star.co.ke/news/children-malnourished-pokot#sthash.BxeGlujF.dpbs

K24 ://www.the-star.co.ke/www.reelforge.com/reelmedia/stream/video_stream.php?itemid=2824409&encryptid=n54szfkwpdcv09y8hxr91b76t2jq3m&client_id=544&this_agency=1

Launch of Global Nutrition Report 2015

SUN CSA engaged Africa Practice on behalf of SUN networks to support media coverage of the launch of the Global Nutrition Report 2015 in Kenya. Africa Practice drafted the press release, op-ed for newspapers and media tool kit, among other items. The event brought together various stakeholders in Kenya, including politicians and representatives from SUN CSAs in East Africa from Uganda, Tanzania, Ethiopia, Rwanda and Burundi. Invitations were coordinated by SUN CSA. SUN CSA members documented and disseminated a report on the launch (see globalnutritionreport.org/files/2015/12/East-Africa-Launch-of-GNR-2015-Resized.pdf). Five nutrition-trained journalists from counties sup-

ported by SUN CSA were invited to join Nairobi-based journalists to report the launch. Thereafter, various media interviews and talk shows featured nutritionists who disseminated GNR 2015, with wide media coverage including:

- 23 journalists from print, radio, television and bloggers covered the event;
- GNR featured in 22 articles in print, online, radio and television, which translates to a PR value of Ksh.14,960,655 (USD149,607);
- Over 1,000 tweets were generated using the primary hashtag #NutritionReport, while others used the hashtag #GlobalNutrition-Report.

Links to some media articles are shown in Box 3.

Politicians and the media agenda

Kenya's nutrition stakeholders have embarked on the mobilisation of diverse players to integrate nutrition in their programmes and on the sensitisation of political leaders to elevate the status of nutrition and allocate more resources to nutrition programming. These can be achieved by positioning SUN in an office with powers to coordinate other ministries to implement nutrition programmes – the Office of the President.

SUN CSA and partners work closely with politicians to discuss topical issues through the press. A number of national and county leaders are invited to advocacy workshops, where they address specific issues relevant to their counties and make commitments to support efforts to tackle malnutrition. Some politicians and decision-makers often feature in the media discussing nutrition issues during major health events, while others write opinion pieces for the print media. Examples are given in Box 4.

Examples of the impact of such advocacy include:

- During a SUN CSA and Food and Agriculture Organisation (FAO) nutrition advocacy workshop in West Pokot County in August 2014, the County Government leaders committed to prioritise food and nutrition issues in the County Integrated Development Plan and budget. The need for legislation and employment of more nutritionists in a county where one nutritionist serves 85,331 people were echoed by the Deputy Governor, Hon Titus Lotee, and the Speaker of the County Assembly, Robert Katina. Subsequently, in the County's 2015/16 financial year, the Government allocated more funds for staff working in the nutrition department.
- In June 2015, Kajiado County Government announced the creation of a specific budget line for nutrition programmes. This followed sustained advocacy campaigns by SUN CSA through support from the US-based PRB. So far, three other counties (Baringo, Wajir and Mandera) have increased budget allocations for nutrition programmes.

Box 4 Statements by politicians in support of nutrition

"Despite the advances made on the causes of malnutrition and how to address the problem, we have not given nutrition matters enough attention as individuals, planners, leaders and even governments," said the First Lady of the Republic of Kenya, Her Excellency Margaret Kenyatta, who is also the Nutrition Patron, in her opinion article published in The East African newspaper on 6 June 2015 (see bit.ly/1OcmwNO) during the launch of the Global Nutrition Report 2014 in Dar es Salaam, Tanzania.

Member of Parliament and Parliamentary Health Committee Hon Stephen Mule is another strong nutrition advocate. In his commentary published in The Standard newspaper of 15 May 2015 (see bit.ly/1TBPJVx), Hon Mule called on policy-makers to support nutrition programmes: "With devolution in the context of Kenya's constitution, in which 96 per cent of nutrition activities are handled by the county governments, there is even greater need for advocacy in each of the 47 counties to ensure that nutrition is prioritised."

The role of politicians in nutrition advocacy was well-stated by West Pokot County Senator Prof John Lonyangapuo, whose County leads in cases of acute malnutrition (KDHS 2014). Speaking during a SUN CSA media editors' workshop in Nairobi, the Senator was categorical: "Kenyans listen to their politicians. You should come up with a well-crafted advocacy campaign targeting thousands of politicians, members of county assemblies, MPs, senators and governors. They should be trained on nutrition, while materials such as brochures should be prepared and sent to them to compliment the SUN campaign."

- At least six counties supported by SUN CSA have identified nutrition champions, including the county first ladies (wives of governors). SUN CSA conducted the first County Nutrition Champions Workshop on 16 December 2015 in Nairobi.

Conclusions

SUN Civil Society Alliance plans to mobilise journalists to join the network of journalists reporting nutrition that was established in May 2015, mobilise resources to strengthen nutrition media advocacy, build capacity of technical staff to work with the media, lobby media editors to create regular nutrition programmes, and identify nutrition champions in the media who will increase the profile of nutrition.

For more information, contact: Titus Mung'ou, email: advocacy.ke@acf-international.org

References

Global Nutrition Report 2015. Synopsis, page 3. <http://www.ifpri.org/publication/global-nutrition-report-2015>

Box 2 Sensitising media editors on nutrition

SUN CSA held a media editors' sensitisation workshop in Nairobi on 19 June 2015. More than 30 editors and senior journalists attended the workshop. Kenya's SUN Government Focal Point and Head of Nutrition, Gladys Mugambi, and West Pokot County Senator John Lonyangapuo were among the leaders and policy-makers who addressed the media editors' meeting.

The media workshop followed the release of KDHS 2014, which revealed that 26% of children under five years old were stunted, while wasting was at 4% and underweight at 11%. While acknowledging the challenges facing the nutrition sector, Ms Mugambi was upbeat: "Kenya deserves a pat on the back for meeting the Millennium Development Goals target for underweight children, which stands at 11%." She called on various stakeholders and the media to join hands with the government in promoting nutrition awareness: "The media has a big role to play in nutrition campaigns. We all know that media advertisements influence the choice of foods in the household."

Box 3 Media articles covering the GNR launch in Kenya

The Star

www.the-star.co.ke/news/nutrition-report-says-kids-too-short-age

Herald

www.herald.co.zw/more-effort-needed-to-end-malnutrition-in-africa/

Xinxua

www.globalpost.com/article/6700757/2015/12/07/more-efforts-needed-end-malnutrition-africa-experts

K24

www.mediamaxnetwork.co.ke/people-daily/185078/kenya-on-course-to-meet-nutrition-target/

NTV

www.youtube.com/watch?v=25KOZ3uQPuU

KTN

www.youtube.com/watch?v=ByJ6KELCOcQ&feature=youtu.be&app=desktop



By Aashima Garg, Anthony Calibo, Rene Galera, Andrew Bucu, Rosalia Paje and Willibald Zeck



Aashima Garg is Nutrition Specialist based in UNICEF New York. At the time of writing, she was Nutrition Manager with UNICEF Philippines

leading the nutrition emergency and regular programmes. She has over 11 years' of experience in the area of public health nutrition programming across south Asia.



Anthony P. Calibo MD, DPPS is a Medical Specialist IV at the Family Health Office, Department of Health, Manila. He is the current Chair of the CMAM and

IYCF National Technical working groups.



Rene Galera MD, MPH is a Nutrition Specialist with UNICEF Philippines.



Andrew Bucu MD, MPH is a SAM Management Scale Up Consultant, engaged by UNICEF Philippines.



Rosalie Paje MD, MPH is Division Chief, Preparedness Division, Health Emergency Management Bureau, Department of Health, Manila. She chaired the

CMAM Technical working group from mid to end 2015.



Willibald Zeck MD, MA is Chief of Health and Nutrition Section, UNICEF Philippines.

The authors would like to acknowledge colleagues from the National Nutrition Council, Department of Health – Asec. Maria-Bernardita T. Flores, CESO II, Assistant Secretary of Health and Executive Director/ Chair of the National Nutrition Cluster; Maria Lourdes A. Vega, Chief of the Nutrition Policy and Planning Division; Margarita D.C. Enriquez, Nutrition Officer II/IMO and Secretariat of the National Nutrition Cluster. Thanks also to Valid International for technical support in development of the National Guidelines, members of the National CMAM working group, and Christiane Rudert and Cecile Basquin from UNICEF East Asia and Pacific Regional Office.

Screening for SAM using MUAC

Management of SAM in the Philippines

From emergency-focused modelling to national policy and government scale-up

UNICEF, Philippines, 2015

Location: *The Philippines*

What we know: Access to essential health and nutrition services by the poor and marginalised in the Philippines is low, exacerbated by recurrent disasters and conflict. Malnutrition persists as an alarming concern in the country.

What this article adds: The emergency response to super-typhoon Haiyan in 2013 included successful, cluster-led programmes for treatment of severe acute malnutrition (SAM), but highlighted significant shortfalls in national policies, protocols, health system capacity, supplies and government buy-in. Subsequently, national guidelines for the management of SAM were developed and adopted by the Philippine Government in a participatory, consultative process led by the Department of Health, with UNICEF technical support, expert and partners' consultation, and SUN stakeholder involvement (under the auspices of the national CMAM working group). MAM guidelines are also in development, but issues around commodity supply costs at scale and competing agency mandates have hampered integration with SAM guidance and finalisation. A detailed scale-up plan for integrated SAM treatment is now in development for 16 priority provinces; supplies are one hundred per cent funded by the Department of Health's 2016 Annual Investment Plan.

Background

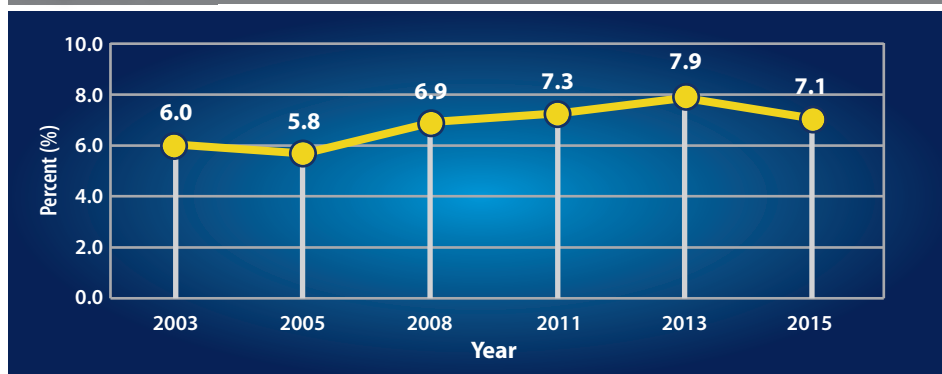
The Philippines is a middle-income country that has enjoyed reasonable economic growth in recent years. Progressive Gross Domestic Product (GDP) growth is projected for 2016, with a 6.3% increase from a 6.1% increase in 2014 (Asian Development Bank, 2015), positioning the Philippines among countries with the highest economic growth in Southeast Asia. However, compared to other countries in the Association of Southeast Asian Nations, the country's nutrition indicators are still lagging. While the 2015 Global Nutrition Report shows the Philippines to be "on course" towards achieving the stunting target, (although more recently released 2015 National Nutrition Survey data show an increase from 30% to 33.4% in 2015), the country is "off course" in progress towards the targets for wasting in children under five years old and anaemia among women of reproductive age by 2025.

The country showcases glaring, income-based inequities and its health systems are regularly challenged by natural disasters and armed

conflict. Political factors, weak policies and decentralisation resulting in muddled accountabilities at local and national levels have resulted in low access to essential nutrition and health services in remote, poor and minority communities. Political patronage and the lack of "voice" of the poor mean that health and nutrition expenditures are often skewed in favour of the rich. Research from the World Bank finds that the Philippines is one of only 20 countries in the world (among 69 assessed) where government expenditure on health is "significantly pro-rich" (Wagstaff, Bilger, Buisman et al, 2014). Being affected by more than 20 typhoons each year, the environmental context of the Philippines makes disaster preparedness and resilience particularly critical. It is the third-most disaster-prone country in the world, with high vulnerability not only to typhoons but also to flash flooding, volcano eruptions and earthquakes.

High burden of wasting

Despite substantial economic growth, the prevalence of wasting in the Philippines consistently

Figure 1 Increasing trend of national wasting prevalence from 2003 to 2015

Source: National Nutrition Survey 2015, Department of Science and Technology, Food and Nutrition Research Institute (DOST FNRI)

increased from 2003–2013, with only a slight decrease in recent years. According to the 2015 National Nutrition Survey (Figure 1), wasting increased from 7.3% in 2011 to 7.9% in 2013, but decreased to 7.1% in 2015. This translates into an estimate of nearly 1.5 million wasted Filipino children under five years of age, around a third (estimated 500,000) of whom are severely wasted. The same survey noted regional variations for wasting in children 0 to 5 years of age, reflecting increasing inequities across the country. Wasting is a major concern in the Philippines, particularly as it is a highly disaster-prone country and since the risk of developing wasting increases during humanitarian emergencies.

Lack of policies, standard protocols, systems and capacity for the management of acute malnutrition

Since the 1970s, treating a child for malnutrition in the Philippines meant admission to a malnutrition ward (MalWard), a delegated area within a hospital that focused on fully accommodating the special needs of children with malnutrition. Over time, priorities of hospitals were shifted away from malnutrition, leading to the deterioration or subsequent phasing out of the MalWards. Furthermore, the treatment of malnutrition was largely hospital-based, with clinicians using outdated protocols. Over the years, local government units (LGUs; equivalent to districts) have been resorting to supplementary feeding initiatives at the school or community level to treat wasting in young or school-age children. These initiatives were, and still are, managed by school or health workers who are neither trained on adequate, evidence-based management of wasted children, nor equipped with the necessary tools to identify or report such cases. The management of severe acute malnutrition (SAM) remained a key emergency response intervention during the recurrent natural disasters and conflicts in the Philippines from 2008 to 2013, but could not be carried out at scale in the absence of a national protocol and guidance to inform a coherent, country-wide scale-up.

When super-typhoon Haiyan impacted the Philippines in November 2013, the SAM management programme, which was led by the Philippine National Nutrition Cluster, was effective in saving the lives of around 1,000 children

with SAM as part of its strategic response plan, but again highlighted the lack of national policy, standard protocols, systems and capacity essential for the sustainability and scale-up of essential services for children with SAM. The experience from the Haiyan emergency response, coupled with the evidence-based advocacy efforts of the Nutrition Cluster and partners, also resulted in increased awareness and demand from LGUs on improving access and availability of essential services for children with SAM.

To address the high burden of SAM in the country, the Philippine Nutrition Cluster prioritised the urgent need to support the development of national protocols and policy on the management of SAM for children under five years of age. This was achieved through its community-based management of acute malnutrition (CMAM) working group led by the Department of Health (DOH). The broad objective of this prioritisation was to improve the access and availability of life-saving services for children with SAM through the institutionalisation of SAM management within the national and local health systems, in both emergency and non-emergency settings.

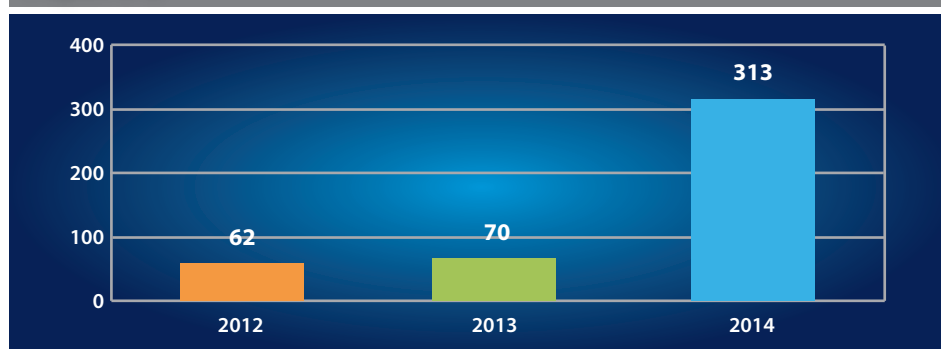
Development and endorsement of national protocols and policy for management of SAM in children under five years of age

In 2011, with the objective of institutionalising CMAM as part of health-systems strengthening, the Nutrition Cluster, supported by UNICEF, started the development of national guidelines for the management of SAM in the Philippines.

A consultative workshop was organised where various stakeholders, including staff from the DOH and members of the CMAM task force of the Philippines, were engaged to adapt generic protocols into the Philippine Integrated Management of Acute Malnutrition (PIMAM) protocols. However, due to the unavailability of essential commodities (ready-to-use therapeutic food (RUTF), F-75 and F-100) in the country, procurement concerns by the DOH, and lack of a defined operational component in the PIMAM protocols, the guidelines could not be adopted by the DOH.

Despite the lack of endorsement as a national policy, the PIMAM guidelines were used by Nutrition Cluster partners and the Philippine Government as a reference to deliver emergency nutrition services during several high-impact humanitarian emergencies. Between 2011 and 2015, the Philippines was repeatedly affected by several disasters (including tropical storm Washi, typhoons Bopha and Haiyan, the Bohol earthquake and armed conflicts in Zamboanga City and central Mindanao), where the protocols were implemented to provide life-saving care to affected children. In addition to emergencies, the draft PIMAM protocol was also implemented in the urban development context of Davao City in 2014.

The experiences of implementing SAM management programmes over the last seven years in various settings in the country have resulted in building local capacity in the programme areas and have generated the evidence necessary at local level to support national advocacy. The number of trained healthcare staff at national, regional and district levels has increased. In 2014 alone, 1,766 healthcare personnel (doctors, nurses, midwives and community nutrition/health volunteers) were trained on SAM management protocols. The number of functional outpatient and inpatient therapeutic care centres increased from 62 health facilities in 2012 to 313 community health stations and hospitals in 2014 (see Figure 2). These facilities have been providing life-saving services to children under five years of age with SAM since then (UNICEF, 2014). Although these experiences were successful in providing life-saving care to children with SAM, largely in emergency-affected contexts, they highlighted the critical gaps in the lack of national policy, DOH-endorsed standard pro-

Figure 2 Rise in number of health facilities in the Philippines providing life-saving SAM management services since 2012 (UNICEF Nutridash Data, 2014)



UNICEF, Philippines, 2015

A severely malnourished child receives RUTF

tolcols, systems and capacity essential for the sustainability of the initiatives and the scale-up of services for children with SAM in every *barangay* (village).

In mid-2014, realising the urgent need to integrate the services for management of SAM into the regular health system and to address identified critical gaps, with UNICEF's support the Nutrition Cluster reinitiated the process of updating the 2011 draft guidelines. Members of the DOH-led national CMAM working group (one of the four technical working groups under the National Nutrition Cluster) identified key gaps in facilitating the endorsement of the national guidelines and policy. These were: (1) Inclusion of the operational component into the national guidelines for integrating services for SAM into health systems; (2) A consultative and transparent guidelines development process involving national experts from various fields (practitioners, academicians, implementers, administrators and service providers); (3) Aligning the technical guidelines to the most recently updated World Health Organization (WHO) recommendations for the management of SAM in infants and children (WHO, 2013); (4) Passing the leadership for guidelines development on to DOH for increased ownership of the guidelines; and (5) Developing guidelines with a focus on implementation during both non-emergency and emergency settings.

While guidelines for the management of SAM were being developed, the Nutrition Cluster was also updating the guidelines for the management of moderate acute malnutrition (MAM) with technical support from the World Food Programme and Save the Children. The initial plan was to merge the two guidelines as one for endorsement by the DOH. However, the finali-

sation of the MAM guidelines and their integration into the SAM guidelines were hampered due to supplementary food supply cost at scale and competing agency mandates in developing the guidelines. There was a lack of consensus by the CMAM working group on the supplementary food to be used for the treatment and the high costs associated in using ready-to use supplementary food (RUSF) or a locally produced supplementary food for treating children with MAM at scale using national government resources. In light of the delays over finalisation of MAM guidelines, the cluster decided to move ahead with the endorsement of the guidelines and policy for SAM management. The MAM guidelines will now be integrated into the national guidelines on supplementary feeding being developed by the National Nutrition Council (NNC). However, both guidelines and policy on SAM management include and define the preventive linkages with MAM management in the community.

Under the leadership of the DOH, with technical support of UNICEF¹ and in consultation with partners and experts using the platform of the national CMAM working group, national guidelines for the management of SAM were developed and submitted to the Philippine Government for endorsement. This consultative and participatory process, which lasted for about one and a half years, led to an improved understanding and ownership of the government on the criticality of the SAM management programme within the ongoing health-systems strengthening. This, coupled with having a defined operational component for implementing the technical protocols with details on supplies and programme costing integrated into the health systems, resulted in DOH endorsing the national guidelines and the policy. On 1 October 2015, the *National Guidelines for the Management of SAM for children under 5 years* were signed by the DOH Secretary and launched on 5 November 2015 in Manila. In December 2015, the DOH issued Administrative Order 2015-055, its highest policy instrument for the health and

nutrition sectors, providing the policy and strategic framework to guide the adoption and implementation of the national guidelines at the local level. In parallel, DOH and UNICEF teams worked on developing a draft scale-up plan to implement the SAM management programmes in a phased approach. This process involved a series of technical discussions with DOH programme officers on essential supply requirements and product registration, caseload calculations, costing projections and identification of priority areas. A total of 16 priority provinces were identified² for Phase 1 of SAM programme scale-up by the DOH starting in 2016.

These actions show the commitment of the Philippine Government to achieve *kalusugang pangkalahatan* (universal healthcare) by integrating the services for management of children with SAM into the routine healthcare system. In line with the country's commitments to Scaling Up Nutrition (SUN), the Second International Conference on Nutrition, and the World Health Assembly Resolution on Maternal, Infant and Young Child Nutrition, the DOH has allotted US\$3.3 million in its 2016 investment plans for the scale-up of SAM management services, targeting 34,000 children with SAM in 16 priority provinces. The costs in the investment plans are for procurement of SAM programme commodities (RUTF, F-100, F-75 and basic medicines), together with some training and programme costs per province. The gaps in training component of the scale-up in 2016 are being supported by UNICEF, using emergency and development programme funds. The DOH has plans to fund the other phases of the SAM management scale-up, expanding it to all the provinces in the country. Under the SUN commitment, efforts are also being made by nutrition partners

¹ Valid International provided international technical expertise in the development of the national guidelines.
² Priority provinces identified were based on DOH's 43 priority provinces; those with high levels of wasting based on the National Nutrition Survey (2013); and those that are hazard-prone and have existing capacities for implementation of outpatient and inpatient therapeutic care services.



UNICEF, Philippines, 2015

Launch of the SAM MOP

Field Article

to raise more funds for nutrition in the Philippines. Given its middle-income country status, however, partners – including the UN – are finding it very difficult to raise funds for nutrition. While the annual budget of the DOH has been increasing (tripling in the last four years), only a small share is earmarked for nutrition interventions. The focus for SUN partners is therefore on strengthening the investment case for nutrition, with continued advocacy on increased government investment for nutrition. This effort is linked to developing the SUN Common Results Framework, which is aligned to the new Philippine Plan of Action for Nutrition (2017-2022).

Figure 3 summarises the step-by-step approach for the development of the national guidelines, policy and plans in the Philippines. The evidence generated from both emergency and development SAM programming facilitated the development of draft guidelines aligned to global updates and national policies. Using the CMAM working group platform with technical inputs from international and national experts, technical guidelines and the operational framework were finalised. Using a consultative and participatory process involving national and local actors, defining procedures, tools and indicators, the necessary consensus was built. This led to the ownership and endorsement of the national



A mother is counselled on infant feeding

UNICEF, Philippines, 2015

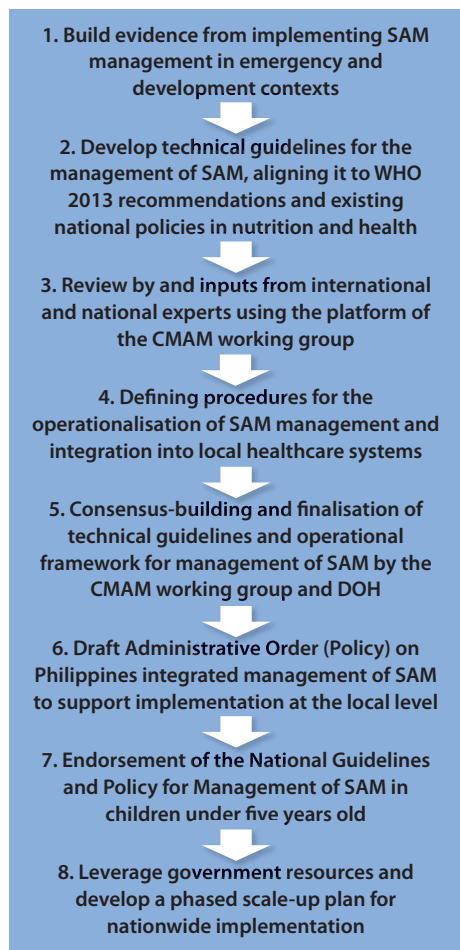
guidelines, policy and plans. This has been a major achievement by the Philippine Government towards institutionalising SAM management services into the routine healthcare system. This achievement is also a milestone of Philippines' commitment to SUN, as the members of the CMAM working group under the Nutrition Cluster are also the members of various networks under the SUN multi-partner platform. The Philippines has the advantage that the DOH's NNC plays the dual role of Nutrition Cluster chair and the SUN Secretariat in the Philippines. This has led to greater involvement of the SUN stakeholders in ownership of the national guidelines.

working group and leading on the protocol development process improved ownership, which was critical for the validation and endorsement of the protocols, policy and budget.

After an intensive and consultative process, the National Guidelines for Management of SAM have been adopted by the Philippine Government as an evidence-based and equity-focused nutrition intervention for children under five years old. The DOH, UNICEF and the Nutrition Cluster are working towards countrywide scale-up of the National Guidelines for Management of SAM and are in the process of developing a detailed scale-up plan. Phase 1 of the scale-up plan is for implementation in 16 priority provinces, starting in 2016. Key components of the scale-up plan include: 1) Dissemination of national policy and protocols at the local level; 2) Capacity-building of trainers and implementers at the national and local levels; 3) Establishing procurement systems of essential SAM management commodities; 4) Establishing monitoring and reporting systems, including bottleneck analysis; 5) Advocacy and communication for effective community mobilisation and institutionalisation of SAM management services in pre-service and in-service curricula of service providers; and 6) Linking SAM management services with the Conditional Cash Transfer Programme and PhilHealth (national health insurance entity) out-patient and in-patient insurance packages.

For more information, contact: Aashima Garg, email: aashi07@yahoo.com; agarg@unicef.org

Figure 3 Step-by-step approach towards the development and implementation of national SAM guidelines, policy and plans in the Philippines



Lessons learned from SAM national protocols and policy development in the Philippines

1. Updating and developing national guidelines is a critical step towards building consensus among all actors in and outside the Government and in agreeing to collectively support SAM management programmes.
2. The process of protocols development should be participatory and consultative (involving both national and sub-national actors) to ensure ownership of the programme and protocols.
3. For the Government to endorse the SAM management protocols and plan scale-up, it is important to include both technical and operational components in the guidelines.
4. International standards and protocols need to be subjected to consultation, adapted to country realities and contextualised in order to improve acceptance and ownership.
5. The development of practical and user-friendly protocols is critical. Clarity for end users of the protocol should be ensured.
6. Simplified tools and job aids are critical protocol components. Protocols should undergo consensus and testing at the sub-national and national levels.
7. SAM management protocols should address all four components of CMAM and MAM protocols, which need to be integrated from the beginning of the protocols development process.
8. Protocols need to be developed for both emergency and non-emergency contexts for both SAM and MAM.
9. DOH chairing of the national CMAM

References

Asian Development Bank 2015. *Asian Development Outlook 2015: Financing Asia's Future Growth*. www.adb.org/publications/asian-development-outlook-2015-financing-asias-future-growth

UNICEF 2014. *Nutridash 2013: Global Report on the Pilot Year*. New York: UNICEF, 2014. www.unicef.org/publicpartnerships/files/2014_Annual_Results_Report_Nutrition.pdf

Wagstaff A, Bilger B, Buisman L, Bredenkamp C, 2014. *Who Benefits from Government Health Spending and Why? A Global Assessment*. Policy Research Working Paper No. 7044. World Bank Group, Washington DC, 2014. openknowledge.worldbank.org/handle/10986/20376.

WHO 2013. *Updates on the management of SAM in infants and children guideline*. World Health Organization 2103. www.who.int/nutrition/publications/guidelines/updates_management_SAM_infantandchildren/en/

Severe acute malnutrition

An unfinished agenda in East Asia and the Pacific

By Cecilia De Bustos, Cécile Basquin and Christiane Rudert

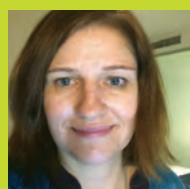


Cecilia De Bustos is a nutrition and public health specialist who currently works as an independent consultant. She has more than seven years of experience working in developing countries, mainly in Latin America and Asia.



Cécile Basquin is currently a nutrition in emergencies consultant working with UNICEF in the East Asia and Pacific regional office. She previously held a technical advisory role at ACF New York HQ. She has

experience of a wide range of nutrition interventions in sub-Saharan Africa (DR Congo, Nigeria, Kenya, Uganda and South Sudan) and Asia (Pakistan).



Christiane Rudert is Regional Nutrition Advisor, UNICEF East Asia-Pacific Regional Office in Bangkok, providing technical and strategic support on nutrition to 14 countries. With 20 years of professional experience in

international public health and nutrition in humanitarian and development contexts, she has worked in Namibia, Zambia, Ethiopia and Mozambique.

The authors acknowledge the immense contribution of the speakers of the *Regional Consultation on Prevention and Treatment of Severe Acute Malnutrition in Asia and the Pacific*, who provided the information that is the basis for this article (by alphabetical order): Hedwig Deconinck (Public Health Researcher, University of Louvain), Katrin Engelhardt (Regional Nutrition Advisor, WHO WPRO), Alison Fleet (Technical Specialist, UNICEF Supply Division), Aashima Garg (Nutrition Specialist, UNICEF Philippines), Katrien Ghoos (Regional Nutrition Advisor, WFP Asia Regional Bureau), Saul Guerrero (Director of Operations, Action Against Hunger UK), Nam Phuong Huynh (Senior Government Officer, National Institute Nutrition, Vietnam), Jan Komrska (Contracts Specialist, UNICEF Supply Division), Arnaud Lailou (Nutrition Specialist, UNICEF Cambodia), Roger Mathisen (Regional Technical Specialist, Alive & Thrive/FHI 360), Zita Weise Prinzo (Technical Officer, WHO HQ), Dolores Rio (Nutrition Specialist, UNICEF HQ), Christiane Rudert (Regional Nutrition Advisor, UNICEF EAPRO) and Frank Wieringa (Senior Researcher, IRD).

Location: *East Asia and the Pacific*

What we know: The burden of severe wasting is high in emergency-prone and highly inequitable East Asia and the Pacific but access to treatment is low (indirect coverage estimated at 2%). Low awareness and commitment by government and stakeholders are identified barriers.

What this article adds: In most East Asia and the Pacific countries, Integrated Management of Acute Malnutrition (IMAM) is mainly implemented as a short-term emergency intervention in the region; it has not been a priority among most governments or development partners. While country SAM guidance exists in most countries, the majority are outdated/not endorsed by government. In June 2015, UNICEF and partners led an action-oriented regional consultation on SAM treatment to identify and address constraints and map a way forward. It found there has been progress in Timor Leste, Cambodia, Democratic People's Republic of Korea (DPRK) and Vietnam in scale-up of pilot interventions, with plans in Myanmar and the Philippines. It addressed the considerable challenges to implementation, including lack of integration in health services, varied system capacity, bottlenecks in supply management, and lack of government investment, with heavy dependence on external financing. There are poor linkages between SAM and MAM management programmes. A context-specific approach to IMAM services delivery, using a health-systems strengthening lens, is needed for each country. Governments should consider IMAM in regional and national nutrition plans, linking acute malnutrition and stunting agendas and emphasising prevention; articulation of programming strategies and adaptation to development, fragile and emergency contexts is needed. Country-specific priorities, accompanied by key actions, must include improved quality and coverage of inpatient and outpatient SAM management services; scale-up in both humanitarian and development contexts; investment in health-system strengthening; health staff training; establishing a nutrition supply chain system; and consistent, targeted regional advocacy on right to treatment. Despite encouragement, as of 2015 only one country has committed financing to IMAM in the short term.

Background

Globally, it is estimated that 50 million children under five are wasted, with approximately two thirds of them living in Asia (UNICEF, WHO & World Bank, 2015). Despite the positive economic growth and great achievements in health and nutrition indicators over the last years, it is estimated that in 2015 almost six million children became severely wasted in East Asia and the Pacific. Moreover, only around 2% of the estimated annual caseload of severely wasted children had access to treatment (according to information originating from the nine countries from East Asia and the Pacific with treatment programmes that reported in 2014). If left untreated, severe acute malnutrition (SAM) in early childhood carries an 11.6-fold increased risk of dying or higher likelihood of contracting infectious diseases (Olofin, McDonald, Ezzati et al, 2013). Moreover, wasted children are more likely to become stunted and develop chronic diseases later in life. Recent trends have shown a high burden of wasting in a number of upper middle-income countries that have no treatment programmes, such as China and Thailand, with close to two million and 250,000 estimated wasted children, respectively.

In spite of the increased political commitment and the strong momentum for

nutrition at the global level, SAM constitutes a largely unfinished agenda: a hidden anomaly in a rapidly developing region. While it is agreed that SAM is a disease, it is most often not treated as such in East Asia and the Pacific, despite the existence of a cost-effective, WHO-endorsed approach for management of SAM (Integrated Management of Acute Malnutrition – IMAM). The implementation of at least one of its components (i.e. inpatient care of SAM, outpatient management of SAM, management of Moderate Acute Malnutrition (MAM) and community mobilisation) is feasible in all settings.

For every dollar invested in nutrition programmes, the return on investment is estimated to be US\$48, US\$44 and US\$36 for Indonesia, Philippines and Vietnam, respectively (Horton & Hoddinott, 2014). Even if similar data are still being developed for IMAM programmes, the return on investment is most likely also high as well. Therefore, drastically reducing SAM, as well as other forms of malnutrition, is critical for national development. However, the vast majority of severely wasted children in East Asia and the Pacific will not receive treatment in 2016 and beyond if the current situation is maintained. Low levels of awareness and commitment to the issue have been identified as key factors for the

lack of investment by both governments and cooperation partners in the prevention and treatment of acute malnutrition.

Opening a space for dialogue and governmental commitment

As part of a broader effort by UNICEF and partners to raise awareness and promote commitment to address acute malnutrition, a Regional Consultation on Prevention and Treatment of Severe Acute Malnutrition in Asia and the Pacific was held in Bangkok, Thailand, in June 2015. The meeting was organised by the UNICEF East Asia and Pacific Regional Office (EAPRO) with representatives from the governments of 13 countries (Cambodia, Indonesia, Lao People's Democratic Republic, Mongolia, Myanmar, Pacific Islands countries (Vanuatu, Samoa, Solomon Islands, Fiji), Philippines, Papua New Guinea, Timor Leste and Vietnam), as well as development partners (UNICEF (country offices and headquarters), the World Food Programme (WFP), the World Health Organization (WHO), Action Against Hunger (ACF UK), Alive & Thrive, Save the Children, International Relief & Development (IRD), University of Louvain, Mahidol University and European Union). The objectives of the consultation were to discuss the latest evidence on nutrition-specific and nutrition-sensitive delivery platforms for the prevention and treatment of acute malnutrition; examine the strengths and challenges of the currently implemented SAM management approaches in East Asia and the Pacific; and identify the importance of acute malnutrition within the larger nutrition operating environment and the integration into national systems and existing coordination mechanisms at country level. At the end of the consultation, government representatives put forward a number of actions to be implemented in the short and long term (UNICEF, 2016).

This article summarises the key discussions held during the meeting, the general commitments made by countries to implement specific actions and a review of key activities carried out by one country (Myanmar; see Box 1) since the meeting, as a follow-up to those commitments.

IMAM in both emergency and development settings

East Asia and the Pacific is an emergency-prone region. The primary settings where IMAM services are often established and delivered are high-risk areas or in emergency situations. However, identification of IMAM as an emergency intervention has led to a lack of programme sustainability. Many IMAM programmes that are initiated in the onset of an emergency are often stopped once the emergency relief operations are over. Pilot programmes are often discontinued or never scaled up. Moreover, full integration of IMAM within the health system has not yet been achieved in any country of the region; the two main reasons are lack of national capacity in the national system to respond in these emergency-prone contexts and the consequent short-term planning of the emergency-based programmes. Yet the vast majority of children affected with SAM do not necessarily live in

areas prone to disaster and are frequently concentrated in urban areas with large populations. Implementing IMAM exclusively in emergency contexts is limiting the improvement in coverage and quality and the expansion necessary to reach the almost six million new cases of children with SAM who are not being treated in the region each year. Hence, IMAM should be urgently institutionalised and prioritised in the development context.

At the same time, emergencies constitute an opportunity to expand and strengthen IMAM services and an entry point for longer-term, sustainable programmes. Governments are encouraged to take the lead in coordinating efforts among different stakeholders involved in IMAM and in bringing humanitarian and development sectors much closer together. These multi-sector and multi-stakeholder coordination efforts will be crucial to build resilient communities and systems that are less vulnerable to shocks.

Current status of IMAM in the region

At the time of the regional consultation on SAM, the vast majority of countries in East Asia and the Pacific were at initial stages of IMAM programme implementation. In spite of many countries having already included SAM into national maternal, newborn and child health policies and having prepared IMAM protocols, most of these are incomplete, out-dated or not approved. The Democratic People's Republic of Korea (DPRK), Myanmar, Papua New Guinea, the Philippines, Vanuatu and Vietnam have already incorporated the 2013 WHO guideline updates on the management of SAM into their protocols. However, only two countries have officially endorsed them: DPRK and the Philippines (who endorsed National Guidelines on the Management of Severe Acute Malnutrition for children under five years in October 2015; see article in this issue of Field Exchange; Garg, Calibo, Galera et al, 2016). It is also expected that Myanmar will soon endorse an updated protocol.

Timor Leste is one of the few countries in the region that has introduced IMAM in all districts, while Cambodia, DPRK and Vietnam are in the process of scaling up their pilot interventions. Overall, significant improvements are needed to achieve more effective IMAM services and in particular to improve the overall quality and coverage (indirect coverage, programme coverage and geographical coverage) of the services. This calls for intensified advocacy efforts. The Philippines and Myanmar are planning to scale up their IMAM programmes, with a focus on institutionalising the treatment services, and most countries in the region have implemented both inpatient and outpatient SAM management services to varying degrees. However, Mongolia and Solomon Islands have only established inpatient care thus far, while Papua New Guinea and Cambodia are now beginning to establish services for both inpatient and outpatient care. Community-based platforms are not yet widely used in the context of IMAM in East Asia and the Pacific and will therefore require special attention in the near future.

With regard to public financing, much work is still needed in a region where many countries are still dependent on support for IMAM from development partners. Only three countries - Cambodia, the Philippines and Timor-Leste - have reported governmental contribution for supply funding. Cambodia and Timor Leste are also the only two countries that have incorporated ready-to-use therapeutic foods (RUTFs) on the essential medicines list (Vietnam has RUTF registered in the list of essential supplies but as a food, and is in the process of registering RUTF as a medicine so that it can be covered under the health insurance scheme).

Only three countries (Indonesia, Mongolia and the Philippines) have reported the inclusion of at least one SAM indicator in their Health Management Information System (HMIS); mainly by number of admission or screenings.

Challenges in East Asia and the Pacific

Some of the overall challenges to the implementation and scale-up of effective (high coverage and high quality) IMAM services are lack of policies and protocols, poor integration of IMAM services into the health system, limited investment from both governments and partners, lack of trained human resources in all areas (including remote and difficult to reach regions and population groups), weak information systems, limited and unstable availability and accessibility of essential medicines, and in some cases, a low level of awareness and commitment to the issue.

Specific challenges that prevent an optimal service delivery are the low quality of care, lack of patient-centred care, lack of community engagement, and lack of links with other health and nutrition services and community services. Countries in the region are at varying degrees and phases of integration of IMAM in standard health service delivery systems. In addition, most health information systems do not provide critical information about SAM.

In addition, a number of bottlenecks have been identified with relation to the management of supply and logistics, such as RUTF pipeline breaks, data problems, unpredictable funding, and delays and challenges in setting up local production of RUTF. Local RUTF manufacturing depends heavily on the import of ingredients¹ and suffers from the lack of infrastructure and a weak legal framework. Misconceptions about local RUTF manufacturing, RUTF recipes and pricing are widespread. Increased competition of suppliers in the market has not resulted in price reduction. Another issue is RUTF storage conditions, which are often not adequate, leading to product deterioration and losses.

Integrating IMAM in the health system platform

Given the large differences among health system delivery platforms of countries in East Asia and the Pacific, it is crucial that a context-specific approach to IMAM services delivery is designed and implemented for each country. Governments of the region are therefore encouraged to strategise

Figure 1 The six building blocks of the health system

and plan their IMAM approach through a health system strengthening lens, looking at opportunities to simultaneously strengthen the six building blocks of their health system while integrating IMAM management into them (Figure 1) as an initial step to achieve full institutionalisation of IMAM.

The linkage between IMAM and the first building block is established when *governance, coordination and advocacy* efforts that are crucial to ensure key IMAM actions, are integrated into the frame of the health system and sustained, such as integration of IMAM protocols into existing national policies, increase of governmental budget allocation for IMAM or incorporation of IMAM into other sectorial policies, such as food security or development policies.

Second, a physical and social coverage of the *health workforce* needs to be sustained, including their presence in urban and rural populations, and in remote and difficult to reach populations.

Third, the integration of IMAM into the *financing* system reflects the linkage with the health system's second building block. This can be achieved through actions such as the creation of partnerships and consensus-building spaces at the political level, generation of evidence (including sound costing estimates), and preparation of valid statements regarding the rationale for the costs involved in the management of SAM.

Fourth, IMAM information systems need to be progressively incorporated within the health management information systems. *Knowledge and information systems* are extremely valuable to understand and address barriers to access.

Fifth, *infrastructure, equipment and supplies* for IMAM need to be embedded into national structures. In this framework, countries are encouraged to advance national processes for registration and listing of the products in their national medicine lists, given the large burden of SAM cases in the region.

Sixth, a number of minimum requirements for IMAM *service delivery* are considered essential and can be achieved through integration within the health system's service delivery structure, including access for poor and difficult to reach populations, decentralised care, a basic package of health services that offer patient-

centred care, quality of care, community engagement, or links with other health and nutrition services, and community services.

Linking IMAM components

Despite the fact that IMAM involves the management of SAM and MAM cases, linkages between these two components, as well as between outpatient and inpatient care, are often very poor in the East Asia and the Pacific region. In the first place, MAM management is generally not at all addressed, with the exception of certain short-term emergency contexts. Where MAM management is implemented, SAM and MAM management services are at times delivered by different platforms, or even different institutions, and effective referral mechanisms between both services are frequently missing (e.g. lack of coordination among health care providers at SAM inpatient care sites, outpatient care sites and MAM management sites). Among others, this lack of well-established linkages leads to situations where children whose health condition has deteriorated, are not referred from MAM to SAM services, or from inpatient to outpatient services, increasing the mortality rate in many instances.

Given the poor level of implementation and lack of linkages among the different IMAM components, the countries in the region are advised to strengthen the prevention strategies for acute malnutrition and their link to IMAM, through counselling and educational programmes that stimulate high quality infant and young child feeding (IYCF) practices, and implementation of programmes of high quality and coverage that link disease prevention and treatment. While treatment strategies for SAM are well established, further evidence is still needed for prevention of acute malnutrition and management strategies for MAM in development settings, especially in infants younger than six months.

Including IMAM in the global, regional and national nutrition agendas

Governments of countries in East Asia and the Pacific will greatly benefit from considering IMAM in their regional and national nutrition agendas, and specially linking the acute malnutrition and stunting agendas. By addressing all forms of undernutrition with one package of interventions and using the same frameworks and strategies for prevention and treatment of stunting and acute malnutrition, governments will avoid duplication of efforts that might lead to increased budgets or unnecessary funding gaps. However, further articulation and refinement will still be needed with regard to the specific programmatic strategies for prevention of acute malnutrition, ensuring an optimal adaptation to development, fragile, and emergency contexts.

Future actions and commitments

At the end of the regional consultation, representatives from the participating countries committed to raise the SAM agenda in their respective context by highlighting their priority objectives and key actions to be undertaken during the

following months. At the regional and country levels, future commitments focused on strengthening the design, implementation and monitoring of IMAM components, as well as the link among them, and the integration of IMAM services into the health system platform of each country.

More specifically, it was agreed that quality and coverage of inpatient and outpatient SAM management services was to be improved in all cases. Indonesia and some of the Pacific Island countries committed to develop up-to-date IMAM guidelines, while Cambodia, Lao People's Democratic Republic, Mongolia, Myanmar (see Box 1), Philippines (see article in this issue of Field Exchange; Garg, Calibo, Galera et al, 2016) and Vietnam committed to contextualise, update and/or finalise, with the latest available evidence, the IMAM protocols, guidelines, frameworks and action plans. It is worth noting that in Vietnam, the ongoing actions and future commitments include i) development and endorsement of national IMAM guidelines; (ii) formulation and local production of RUTF; (iii) piloting of IMAM in the five provinces; and iv) advocacy at central level for registration of therapeutic milk and RUTF as medicines and including these products and SAM treatment costs in the national health insurance scheme. The Vietnam case will be documented upon achievement of key milestones of this IMAM scale up approach. Moreover, Lao People's Democratic Republic, Myanmar and Pacific Island countries committed to roll out the above-mentioned IMAM guidelines and protocols. It was agreed by participants that IMAM protocols should correctly reflect the four components of services, even if one or several of the components cannot currently be implemented in a specific context. In addition, it was discussed that protocols should include both technical and operational components and should be written in a simplified, user-friendly and practical manner. Protocols should also include a vision for scale-up, using a phased but integrated approach. Experts also emphasised the importance of strengthening community mobilisation through community empowerment and community systems strengthening, optimising the use of existing platforms and structures to integrate IMAM. In those countries where community-based structures and programmes are absent, it was recommended that service delivery at health facility level should be effectively implemented.

Many of the discussions revolved around the importance of scaling up IMAM services in both humanitarian and development contexts. It was agreed that areas with high burden or high prevalence of SAM should be targeted. A number of representatives from countries (Cambodia, Myanmar, Philippines and Vietnam) and from UNICEF country offices (DPRK) committed to prepare during 2015 and 2016 all necessary

¹ Powdered ingredients (e.g. milk powder, vitamins and minerals) embedded most frequently in a lipid-rich paste (e.g. vegetable oil, sugar, peanuts, beans, roasted sesame seeds, cowpeas, amaranth, roasted rice flour, roasted pearl barley flour, roasted maize flour, roasted chick pea flour), but can also be produced in solid or drinkable forms.

actions for scaling-up the IMAM services throughout the country, including ensuring that IMAM features in the agenda of the multi-sectoral coordination platforms in SUN countries.

In parallel to the integration of IMAM into the health system building blocks, it was agreed that governments were to prioritise health system strengthening. This will allow institutionalisation of IMAM within the country's health system, which in turn will also facilitate scale-up of services. While Lao People's Democratic Republic committed to integrate SAM in the pre-service curricula and Vietnam planned to integrate IMAM services in the health essential service package reimbursed by the health insurance scheme, representatives from UNICEF DPRK committed to scale up IYCF counselling services alongside IMAM to hospitals in 90 counties.

The majority of countries present in the consultation announced their plans to carry out capacity building activities targeted to health care personnel, through trainings (i.e. Myanmar, Lao People's Democratic Republic, Mongolia, Philippines, Timor-Leste, Pacific Island countries, Papua New Guinea, DPRK and Cambodia) or on-the-job coaching activities (Timor-Leste, Myanmar, Lao People's Democratic Republic, DPRK).

A large number of countries (DPRK, Lao People's Democratic Republic, Mongolia, Philippines, Timor-Leste) committed to establish a nutrition supply chain system for SAM treatment, while Cambodia, Philippines and Papua New Guinea committed to advocate and/or ensure

the inclusion of SAM commodities in the national list of essential drugs. Participating countries also showed their commitment to identify contextually appropriate approaches for SAM and MAM management, including the distribution of context-specific specialised nutritious foods and/or cash. While Indonesia and Philippines are planning to explore and identify opportunities for local production of RUTF, Cambodia and Mongolia shared their plans to identify alternative local recipes of Ready to Use Foods, as well as increasing accessibility of these foods through mapping of potential producers (both national and international).

It was also generally agreed that a strong focus should be put on the collection of the right type and amount of information, and all gathered information should help to understand and address barriers to access to treatment. While some countries (Timor-Leste, Papua New Guinea, DPRK and Lao People's Democratic Republic) decided to focus on the inclusion of IMAM indicators in the national Health Management and Information System (HMIS), others (Indonesia, Lao People's Democratic Republic, Cambodia, Timor-Leste and Mongolia) committed to focus their efforts in strengthening the National Information System or the nutrition-related monitoring and evaluation system. The bottleneck analysis approach can be used and adapted to improve the quality and coverage of services. Cambodia and Philippines committed to strengthen the IMAM programme performance through bottleneck analysis, evaluation or review of existing services.

During the consultation, it was agreed that the policy and advocacy components of SAM prevention and management programmes should be systematically addressed in the entire region, requiring consensus building, the collection of various type of evidence, and the establishment of partnerships. For example, representatives from Fiji committed to create an advocacy strategy to support advocacy for child nutrition, including IMAM, at all levels of government. In addition, Lao People's Democratic Republic shared their commitment to implement advocacy activities so that a costing analysis of SAM can be carried out, while Cambodia and Indonesia committed to focus their efforts on data analysis, so that evidence can be generated with regard to the prevalence of SAM in the different contexts. Key advocacy messages to be shared in the region during the coming years will include the need to reposition SAM as a disease, the right of children to receive treatment, and the need to include SAM in the global and regional nutrition agendas, including the message that acute malnutrition can be a contributing factor to stunting.

Despite the fact that countries were encouraged to integrate the cost of IMAM into the different financial systems at national and sub-national levels, no country committed to do so in the short term. While experts will continue to advocate for the design and implementation of prevention programmes that encompass both nutrition-specific and nutrition-sensitive interventions, Timor-Leste and Mongolia committed to establish cross-sectional linkages so that all underlying causes of malnutrition are clearly addressed. Mongolia, Lao People's Democratic Republic and Cambodia committed to create synergies between maternal and infant and young child nutrition, IMAM, supplementation of vitamins and minerals, as well as nutrition in emergencies.

For more information, contact: Christiane Rudert, Regional Nutrition Advisor, UNICEF EAPRO, email: crudert@unicef.org

Box 1 Experiences of Myanmar

By Jennifer Hilton, Public Health Nutrition Consultant, and Hedy Ip, Nutrition Specialist, UNICEF Myanmar.

The Government of Myanmar has included the management of acute malnutrition as part of the essential package of health services. Over the past two years, with technical support from partners, national IMAM protocol and guidelines have been developed and Myanmar is gearing up to roll-out IMAM in 2016. The first phase of roll-out will cover high burden areas in key states/regions with the aim of reaching state-wide coverage over the next years.

At the regional SAM consultation in June 2015, participants from Myanmar defined specific objectives to reach this goal, outlining key steps, identifying main stakeholders and their roles, as well as support that would be required. These related to finalizing guidelines and securing government endorsement; implementation and monitoring of integrated IMAM services at selected pilot states/regions in 2016; and phased scale up to remaining states/regions (at least to all state/regional hospitals) by end of 2016.

Myanmar held national elections in November 2015 and is currently in a transition period as the new Government takes over in April 2016. Given this context, some delays were experienced due to competing priorities, however Government remained committed to continue moving forward with planning of

IMAM roll-out. Actions under Objective 1 and some actions under Objective 2 have been completed as of early 2016. Remaining commitments are expected to be met during 2016 and completed by end of the year. The roll-out of trainings will take place after April when the new Government is in place.

Key highlights of success include the bringing together of a wide range of stakeholders across Government departments, universities, UN agencies and NGOs in support of a common national IMAM roll-out strategy and the inclusion of operational strategies for high prevalence and low prevalence contexts and specific age groups (e.g. older children), which are specific to the context of Myanmar. The roll-out of IMAM will closely follow the roll-out of new national community-IYCF guidelines, which already began at the end of 2015. This will build capacity of health workers across key intervention areas of nutrition and provide an opportunity for integration, in terms of service delivery, community mobilisation, supportive supervision and monitoring. In light of any structural reforms that may take place this year under a new Government, key areas of focus that need to be prioritised in the coming months include coordination, referral and follow-up mechanisms between different Government health departments and partners, and community engagement and outreach services in areas where human resources may be limited.

References

- Garg A, Calibo A, Galera R, Bucu A, Paje R, and Zeck W, 2016. *Management of SAM in the Philippines: from emergency-focused modelling to national policy and government scale-up*. ENN Field Exchange 52, May 2016.
- Horton S, & Hoddinott J, 2014. *Food security and nutrition perspective paper: Benefits and costs of the food security and Nutrition Targets for the Post-2015 Development Agenda*. Post-2015 Consensus. Copenhagen Consensus Center. www.copenhagenconsensus.com/sites/default/files/food_security_and_nutrition_perspective_-_horton_hoddinott_0.pdf, accessed January 16, 2016.
- Olofin I, McDonald CM, Ezzati M, Flaxman S, Black RE, et al (2013). *Associations of Suboptimal Growth with All-Cause and Cause-Specific Mortality in Children under Five Years: A Pooled Analysis of Ten Prospective Studies*. Plos One 8(5): e64636
- UNICEF 2016. *Prevention and Treatment of Severe Acute Malnutrition in East Asia and the Pacific*. Report of a regional consultation. www.unicef.org/eapro/UNICEF_EAPRO_SAM_consultation_2015_report.pdf. Accessed April 12, 2016.
- UNICEF, WHO & World Bank 2015. *Joint child malnutrition estimates - Levels and Trends*. UNICEF-WHO-The World Bank. www.who.int/nutgrowthdb/estimates/en/

Linking with other sectors is a key component of scaling up nutrition



WFP/Charles Hatch-Barnwell, Malawi, 2010

Experiences of multi-sector programming in Malawi

By Felix Pensulo Phiri



Felix Pensulo Phiri is Director of Nutrition in the Department of Nutrition, HIV and AIDS,

Ministry of Health, Malawi. He is responsible for providing nutrition multi-sector oversight function and coordination for the National Nutrition Response and is the SUN nutrition focal point in Malawi.

Thanks are extended to those interviewed in the course of developing this article, including: Violet Orchardson, USAID; Stacia Nordin, FAO; Mutinta Hambayi, Nancy Arbuto, Trust Mlambo, WFP; Molly Kumwenda, CRS; Benson Kazembe, UNICEF; Owen Nkhoma, University of Malawi; Tisungeni Zimpita, CSONA; Kondwani Mpeniuwawa, Department of Nutrition, HIV and AIDS; and Janet Guta, Ministry of Health.

Location: *Malawi*

What we know: Malawi has made strong progress in reducing stunting and other forms of malnutrition, despite challenges of frequent flooding and food insecurity related to climate change. Malawi joined the SUN Movement in 2011.

What this article adds: There is strong political will and commitment by leadership to address hunger and undernutrition: nutrition is a priority area in the national development agenda; there is a nutrition coordinating office; and multi-sector nutrition platforms at national, district and sub-district levels have been established. The National Multi-sector Nutrition Policy and Strategic Plan guides the national nutrition response. The National Nutrition Education and Communication Strategy (NECS) includes both nutrition-specific and nutrition-sensitive programming, the latter catalysed by the SUN Movement and involving multiple sectors in planning and district technical support. Strengths of the SUN/NECS programme include strong leadership at all levels; a clear, consistent (globally and within country) guideline for action; heightened nutrition profile through new district structures; due attention and openness to ongoing learning; alignment of the donor network to support coordinated resource mobilisation; and a well organised civil society network. Challenges relate to fragmented rollout and funding; monitoring and accountability; inadequate consideration of maternal nutrition; conflicted interests of partners; and limited participation of the private sector. Continued support of the District Nutrition Coordination Committees (DNCC) is required; a comprehensive evaluation of NECS rollout would greatly inform future activities.

Background

Malawi is one of the poorest countries in the world, currently ranked 174 out of 187 countries in the 2014 Human Development Index. Life expectancy at birth is estimated at 54.8 years, which is a reflection of persistently high rates of poverty and the severe effects of the HIV/AIDS crisis and other health issues. Additional problems include over-dependence on subsistence production and rain-fed maize production and consumption, which contributes to diets that lack diversity and are poor in micronutrient-rich foods. In recent years, Malawi has been experiencing the effects of climate change, which has led to food insecurity and contributes to

widespread poverty among the population and persistently high rates of undernutrition.

Nutritional situation

Child undernutrition is one of the major problems in Malawi, with a national stunting prevalence of 47%. The double burden of malnutrition is on the increase, with an estimated 5.1% of children under five years old overweight (NSO, 2014), while according to the Global Nutrition Report, 22% of adults are overweight and 5% are obese (IFPRI, 2015). Despite the many challenges, Malawi has made some progress in combating undernutrition and in improving food

Table 1 Trends in nutrition status for children under 5 in Malawi, 2004-14

Indicator	2004 (DHS)	2010 (DHS)	2014 (MICS)
Stunting (%)	53	47.1	42.4
Wasting (%)	6	4	3.8
Underweight (%)	17	13	16.7

security for its population. Key considerations regarding undernutrition include:

Stunting

Stunting remains the major nutritional problem in Malawi, although there are reasons to be optimistic. The Demographic Health Survey (DHS) survey of 2010 showed that stunting had reduced by 1% per year since 2004. The Millennium Development Goals (MDG) end line survey conducted in 2014 (using the UNICEF Multiple Cluster Indicator Survey¹), showed a decrease of stunting at national level from 47% in 2010 to 42% in 2014 (see Table 1 and Figure 1). This survey did, however, highlight regional differences where some districts registered an increase while others registered a decrease; for example, stunting in Chiradzulu District decreased by 15.3%, while rates in Salima District increased by 7.5% (DHS 2010; MICS 2014). At present, there is only some understanding of why stunting is reducing in some areas and increasing in others; urban areas tend to have higher stunting rates (particularly severe in Lilongwe (52.4%) and Blantyre

(47.8%)), likely due to limited interventions, poor water, sanitation and hygiene (WASH) and other infrastructure, and high rates of migration from rural areas.

A worrying aspect of the high stunting prevalence in Malawi is the rate of severe stunting at 16.3% (MICS 2014). This is of concern because of the increased mortality risk associated with severe stunting (x 5.5), which is even higher than that for moderate acute malnutrition (x 3.4 times more likely to die than a healthy child) (Olofin, Macdonald, Ezzati et al, 2013).

Wasting

The MICS survey of 2014 found a national wasting prevalence for children under 5 years old of 3.8% global acute malnutrition (GAM) and 1.1% severe acute malnutrition (SAM). This means that Malawi has reached the World Health Assembly target “to reduce and maintain wasting of less than 5%”; a major achievement. This will, in part, likely be due to the extended efforts over the last 12 years to scale up Community Management of Acute Malnutrition (CMAM) programming across the country. Malawi has made great strides in integrating CMAM programmes into routine health services (something that many countries have struggled with). CMAM interventions continue to be relevant due to the high levels of mortality associated with acute malnutrition, although with GAM rates remaining at low levels, it will be important to ensure that maximum value is extracted from these in-

terventions, considering the high cost of CMAM programming (ENN, 2012).

Micronutrient deficiencies

Micronutrient deficiencies have also been steadily reducing. According to the National Micronutrient Survey conducted in 2009, vitamin A deficiency declined from 59% to 23% and iron deficiency anaemia from 59% to 34% in 2001 and 2009 respectively (among children aged six to 36 months old) (see Figure 2). It is important to note that most of the gains in reducing micronutrient deficiency have been made through the provision of supplements (using a ‘medical model’), rather than from increasing the quality and diversity of diets. Currently there is a global push for agriculture to invest in developing more micronutrient-dense crops, while continuing research on the production of livestock and small animals, fish, vegetables, legumes and pulses. Bio-fortification of food offers great potential, given the largely agro-based economy in Malawi, although key to achieving maximum gains from bio-fortification will be to ensure a focus on awareness-creation of the benefits amongst the general public.

The response to undernutrition

The Government of Malawi (GoM) placed nutrition high on the government agenda by ensuring nutrition was one of the key priority areas in the Malawi Growth and Development Strategy (MGDS 2011-16). The GoM also formulated the Multi-sector National Nutrition Policy and Strategic Plan (2007-2012), which was guided by the ‘three ones principle’, i.e. one coordinating office, one strategic plan and one monitoring and evaluation plan. The policy guides the multi-sector platform in the implementation of the national nutrition response. The policy is currently being reviewed to align with global and national emerging issues. The Department of Nutrition and HIV&AIDS (DNHA) is the coordinating office for nutrition, placed under the Ministry of Health with autonomous responsibility for multi-sector coordination (the DNHA was located in the Office of the President and Cabinet until early 2015). The DNHA is mandated to provide strategic policy direction, guidance, oversight, coordination, technical support, highest-level policy advocacy, resource mobilisation and capacity-building for nutrition, to ensure increased involvement in multi-sector efforts to reduce malnutrition.

There is strong political commitment to addressing hunger and undernutrition, as evidenced by Malawi being ranked third in the 2015 Hunger and Nutrition Commitment Index (HANCI) out of 45 developing countries (www.hancindex.org). Nutrition is a priority area in the MGDS and a range of nutrition-focused policies have been put in place over the past eight years. Furthermore, Malawi has instituted a separate budget line for nutrition, im-

Figure 1 Trends in undernutrition for children under 5 in Malawi

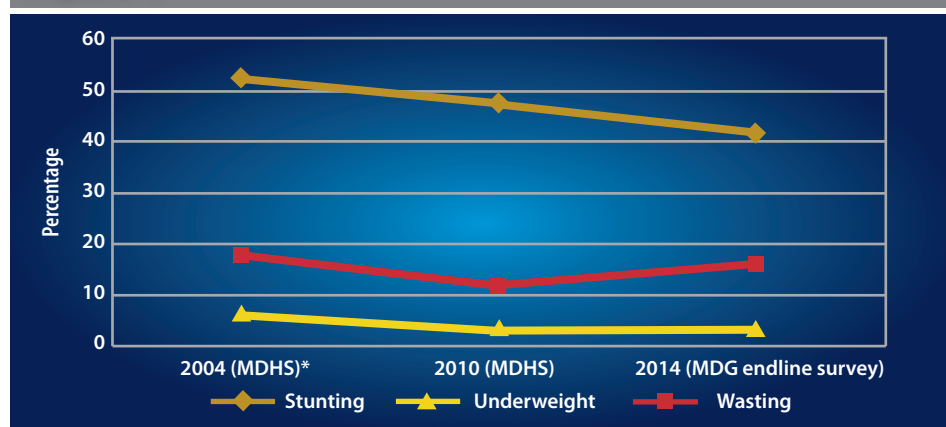
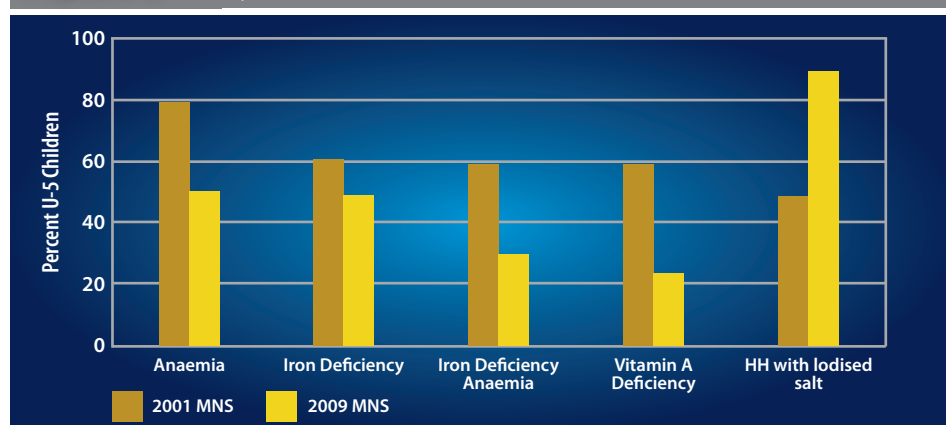


Figure 2 Micronutrient malnutrition for children under 5 in Malawi, Micronutrient surveys, 2001 and 2009



¹ Although MICS surveys use different sampling and methodology to DHS, many stakeholders in Malawi consider the results to be comparable.

Famer loans have been used to strengthen the productive and marketing capacities of small and low-income farmers to access private sector markets



WFP/Charles Hatch-Barnwell, Malawi, 2010

proving public oversight and accountability for spending. Commitment to budget allocations for nutrition by government, through the Nutrition for Growth and the G8 New Alliance for Food Security and Nutrition, has increased from 0.1 to 0.3% by 2020. While this represents more than doubling the allocation, the very low starting point means that more earmarked funding will be required to address undernutrition in Malawi effectively.

Prior to the National Nutrition Education and Communication Strategy (NECS) programme development, (see below), the GoM (with support from key partners) had been implementing a number of nutrition interventions. Nutrition-specific programmes included the CMAM programme, micronutrient supplementation through routine and health campaigns, zinc supplementation for management of diarrhoea, food fortification (sugar and salt) and biofortification (sweet potatoes and beans). Nutrition education and nutrition-sensitive programming began to be emphasised when Malawi joined the SUN Movement (see below).

Scaling Up Nutrition

Malawi was one of the first countries to join the Scaling Up Nutrition (SUN) movement in 2011 as an 'early riser'. At the same time, partners in Malawi realised that while nutrition programming had been focused on very successful treatment models (e.g. CMAM), energy was required to devise and implement behaviour change programming to address prevention issues, with a particular focus on the 'how' of preventative programming. A gap analysis was conducted to identify key focus areas to be scaled up to reduce stunting, with nutrition education identified as a key gap. To operationalise SUN aims and principles, the NECS was developed in 2012 with funding from the main nutrition donors (Irish Aid, World Bank, USAID, DFID, EU and DFATD (formerly CIDA)). UN agencies such as UNICEF, WFP and FAO and civil society partners were also actively involved in the development of NECS. The NECS manual was developed in consultation with partners; care was taken to ensure

that all messages and materials developed were harmonised and standardised.

The NECS embraced multi-sector coordination, which resulted in creation of coordination platforms at national, district and sub-district levels. The operationalisation of NECS used the multi-sector approach, which involved key sectors including the ministries of agriculture, health, education, gender/community development, local government, finance, information, trade and industry. The media was also seen as an important ally in the dissemination of information for the NECS.

The SUN/NECS is designed to foster a multi-sector approach to addressing malnutrition at community level. It aims to bring together key stakeholders implementing both nutrition specific (direct) and sensitive (indirect) interventions. The NECS programme was developed primarily to standardise and harmonise nutrition education messages for promotion of effective behaviour change for the prevention of malnutrition. District rollout plans for NECS, have been developed and adopted by all districts in Malawi, with support from various partners including Irish Aid, USAID, DFATD, World Bank, UNICEF and WFP.

The multi-sector platform put in place to support operationalisation of the NECS included establishment of the National Nutrition Coordination Committee and the SUN learning forum at national level and the District Nutrition Coordination Committees (DNCC) at district level. The DNCC is chaired by the District Commissioner and has representatives from various sectors including health, agriculture, education and the civil society organisations working in the district. The DNCC therefore provides the technical support for the operationalisation of the NECS, with the various sectors supplying the technical support for implementation and rollout. At sub-district level, the Area Nutrition Coordinating Committee (ANCC) is chaired by the Traditional Authority. At village level, the Village Nutrition Coordinating Committee is chaired by the group village headman. This

committee has membership of front-line workers from the ministries of agriculture, health, gender, education and other civil society organisations. At village level, there is also the Area Community Leaders Action for Nutrition (ACLAN) structure, responsible for community sensitisation and mobilisation.

Successes/strengths of the SUN/NECS initiative

Leadership for the programme was strong from the start, using energetic, persistent and continued advocacy to ensure that nutrition was placed centre stage (even before the NECS programme began) and that it stayed there. Partners understood that patience and resolve were required to maintain the belief that working together would be worth the effort, and that everyone's combined efforts would be more than the sum of the parts.

The NECS manual is comprehensive and well developed, based on the suggested actions of the internationally agreed Essential Nutrition Actions (ENA) approach. Using the data and evidence for 'what works', the manual is clear and comprehensive regarding breastfeeding and complementary feeding, and has key education messages on hygiene and improved sanitation. Many stakeholders reported that the major success of NECS is the harmonisation of education and behaviour change messages; all partners use the same messaging and materials across the country. It was described by one interviewee as "like a Bible for Malawi – the go-to reference document for how to implement preventative nutrition programmes."

Establishment of the DNCCs has raised the profile of nutrition issues and empowered the districts to address them. While some districts are more successful than others (depending on the length of time the DNCC has been established, how much capacity there is in each district and district commitment towards nutrition), for the most part nutrition has been successfully 'mainstreamed' across the various sectors.

Establishment of structures, such as community care groups at district level, have been very successful. One of the strengths of NECS is that all government staff at district level are involved at one stage or another in the multi-sector planning, with nutrition becoming central at district level. The use of institutionalised structures for SUN in Malawi has greatly benefited the delivery of the nutrition programme at community level, including Village, Area and District Nutrition Coordination Committees. These structures have helped to create demand-driven ownership of nutrition services across and amongst communities.

Through the National Multi Sector Platform, support was provided to align funding for nutrition activities from development partners, which has helped to prevent duplication of efforts (although this still proved challenging – see below).

In terms of monitoring and evaluation, Malawi developed a Multi Sector Monitoring

plan and web-based reporting system, which has been rolled out in almost 50% of the districts. A web-based resource tracking system was also developed to help track nutrition financing in Malawi.

A good understanding prevails that it is important to be flexible for adapting, monitoring and learning. Efforts were made to extract learning from the start (with a gap analysis) and as the programme has matured. A bottleneck analysis was conducted early on, and regular (annual or biannual) learning forums have been organised to share experiences and capture learning. In this way, SUN/NECS programming in Malawi has attempted to be iterative.

The civil society network (CSONA) has been well organised and provided excellent support for the NECS rollout. There is a good understanding in Malawi of the importance of civil society for its crucial role in improving nutritional status of the population.

Challenges

The SUN/NECS initiative has not been without its challenges, which include:

- *Fragmentation of funding of NECS rollout*
As the NECS programme has no direct funding (it comes from the various partners to the various districts), funding can be variable, inconsistent and fragmented. Activities in particular districts can be dependent on which partner has funding available, what aspects they focus on and at what scale.
- *Monitoring and accountability challenges*
For some years, coordination and monitoring of NECS has been a challenge, particularly in the collection and transfer of data from community up to national level. A new integrated reporting system has been established with support from the World Bank; this is expected to improve monitoring and evaluation of all nutrition activities, including for NECS.
- *Delays in translation of the Social Behaviour Communication Change (SBCC) material*
Some delays in translation of the materials needed to implement the programme were experienced, which meant there were delays in many districts between the training and commencing activities. This was resolved after a few months, since when supplies and logistics have been mostly constant.
- *Competing/contradictory roles for civil society actors*
At district level, the dual roles of civil society actors to support the DNCC with coordination, while at the same time ensuring that the main protagonists for the programme are held to account, can sometimes be sensitive to navigate.
- *Insufficient attention to the period of pregnancy and pre-conception*
While the NECS manual is well developed in terms of the infant/child, the period of pregnancy – or the first 280 days of the critical 1,000 days – is not well addressed in the manual. It is well understood that approx-



A female smallholder farmer working in her maize field in Malawi

WFP/Charles Hatch-Barnwell, Malawi, 2010

- imately 20% of stunting is pre-determined at birth (Black, Victora, Walker et al, 2013), so it is imperative to ensure that maternal nutritional needs are addressed, both for the sake of the mother in her own right, as well as for optimising the health and nutritional status of the newborn. Considering that Malawi has a low birth weight (LBW) rate of 12.9% (LBW is an indication that things have not gone to plan during the pregnancy), the issue of supporting maternal nutrition is vitally important.
- *Limited engagement with the private sector*
While attempts have been made to establish the business network in Malawi, as yet there has been limited engagement with and uptake from the private sector. The National Fortification Alliance meets quarterly, which provides a platform for public-private-partnerships. There is, however, much scope to develop linkages with the private sector further to promote a healthier food environment. Malawi is beginning to struggle with the double burden of malnutrition; it is therefore vital to engage the private sector in efforts to reduce food insecurity and undernutrition, as well as to halt the rising tide of overweight and obesity amongst the population.

Conclusions

The stakeholders interviewed for this article report that the NECS programme has been very successful to date. It has benefited from strong political commitment and support; well coordinated structures through the various networks (particularly the civil society and donor networks); efforts to coordinate funding; development of a well thought-through strategy; and extensive efforts to learn lessons as the programme matures. Actors in Malawi must be commended for developing and implementing this important programme. While there have been a number of challenges with rolling out a large national programme, suggestions from key stakeholders for future actions to improve the programme further are as follows:

- Many stakeholders reported that key to the

success of the NECS rollout is continued and extended support for the DNCC. Most felt that this structure offered the best hope for well-coordinated, multi-sector work at district level, although there is concern that some of the districts lack sufficient nutrition capacity.

- A comprehensive review/evaluation of the NECS programme to date is considered an important next step. This would clearly articulate the successes, challenges and main learning points from the rollout so far. At this stage, more inclusion/emphasis on maternal nutrition and the importance of healthy families were suggested by most stakeholders.
- Further coordination and standardisation of funding modalities and areas is needed.
- Additional effort is required to engage with and include the private sector in SUN efforts.

For more information, contact: Felix Phiri - felixphiri8@gmail.com

References

- Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, Ezzati M, Grantham-McGregor S, Katz J, Martorell R, Uauy R; Maternal and Child Nutrition Study Group. (2013). *Maternal and child undernutrition and overweight in low-income and middle-income countries*. *Lancet* 382(9890) : 427-451.
- DHS 2010. *Malawi Demographic and Health Survey 2010* National Statistical Office Zomba, Malawi. dhsprogram.com/pubs/pdf/FR247/FR247.pdf
- ENN 2012. *Government experiences of scale-up of Community-based Management of Acute Malnutrition (CMAM): A synthesis of lessons*, Emergency Nutrition Network. www.enonline.net/cmamgovernmentlessons.
- IFPRI 2015. *Global Nutrition Report 2015: Actions and Accountability to Advance Nutrition and Sustainable Development*. International Food Policy Research Institute. 2015. Washington, DC.
- NSO 2014. National Statistical Office. Malawi MDG Endline Survey 2014, Key Findings. Zomba, Malawi: National Statistical Office.
- Olofin I, McDonald CM, Ezzati M, Flaxman S, Black RE, Fawzi WW, Caulfield LE, Danaei G; Nutrition Impact Model Study (2013). *Associations of suboptimal growth with all-cause and cause-specific mortality in children under five years: a pooled analysis of ten prospective studies*. *PLoS One* 8(5): e64636.

A 16 year old mother attending a nutrition programme in Bangladesh



Food for thought

Supplementary feeding programme or 'antenatal feeding programme' for pregnant women

By Michael H Golden



Michael Golden is Emeritus Professor at the University of Aberdeen, Scotland. An independent physician and researcher, he has over 40 years of experience in international nutrition, specialising in all aspects of malnutrition.

Thanks to Jane Hirst for reviewing this article and contributing valuable insights and supporting data from an obstetrics perspective. Jane is a Senior Fellow in Perinatal Health and Locum Consultant in Obstetrics & Gynaecology, Nuffield Department of Obstetrics & Gynaecology, University of Oxford. Her area of research is global perinatal health. She is the UK principal investigator in the Interbio21st (www.interbio21.org.uk).

In emergencies, where a functioning health system does not exist or is overwhelmed, pregnant and lactating women who are thin (generally a mid upper arm circumference (MUAC) below 21cm) are admitted to a supplementary feeding programme (SFP), along with malnourished children. This practice has now become routine and has spread to countries without an acute emergency where a health system exists. In some countries, this programme only functions during the 'hungry season', leading to pregnant women in other seasons of the year being denied additional nutrition.

Arguably the most distressing statistic is the percentage of mothers that die during and due to pregnancy. In west and central Africa, it is estimated that 590 mothers die for each 100,000 live births (i.e. at least 0.59% of pregnancies end in the death of the mother), though the nationally reported figures are higher than the estimates. In Sierra Leone more than 1% of pregnancies end in the mother's death and 5% of fertile women die due to their pregnancy (UNICEF, 2015). Such loss deprives a family of a mother and wife who cannot care for the other children or engage in economic activity to support her family. There are estimated to be 2.6 million stillbirths per year globally (Blencowe et al, 2016); nine of the ten countries with the highest rates are in sub-Saharan and west Africa. I cannot find reliable statistics on spontaneous abortion or other pregnancy-related complications for these countries. The low birth weight rate is reported as 14% for west Africa and all "least-developed" countries (UNICEF, 2015) (the rate is 27% in Niger).

Consider two pregnant women in a village 5km from the health centre. The woman with a MUAC of 24cm should go to the antenatal clinic on Thursday, but such women often fail to go or only attend very late in pregnancy. The other woman has been screened and found to have a MUAC of 20cm; she is now told to go to the SFP to collect a ration of blended food on Wednesday. Of course, she should also go to the antenatal clinic on Thursday – but a 10km round trip and a lengthy wait two days in a row is a major challenge for an overworked, pregnant woman; she is much less likely to attend the antenatal clinic

than the woman with a normal MUAC. So, which clinic will she choose to go to? She does not get any substantive help at the antenatal clinic, but does get a valuable ration at the SFP, so she is much more likely to omit to go to the antenatal clinic. In the least-developed countries, only 74% of women attend an antenatal clinic and only 38% attend four or more times. It is unclear what percentage of pregnant women who are referred to SFPs actually attend, but we can speculate that it is higher than the attendance at antenatal clinics. If access to the clinics is difficult or there are major seasonal demands for labour, the difference between attending for an antenatal check-up or receiving supplementary food is likely to increase, to the added detriment of obstetric care.

If we hope to reduce maternal mortality and improve the outcome of pregnancy, antenatal care is critical. Not only does it require attention to the quality and content of care throughout pregnancy and delivery, but we need women to attend the antenatal clinics in the first place. For this reason, I consider that enrolment of pregnant women into SFPs, as currently organised alongside malnourished children and based solely on a MUAC measurement, as likely to increase maternal mortality and result in a poorer outcome of pregnancy. I voiced this opinion to one United Nations representative in west Africa only to be told: "Our mandate is to treat malnutrition, not to save lives." This left me speechless, but is typical of focused programmes that lose sight of the bigger picture, reinforce the notion that nutritional help should be left solely in the hands of nutritionists, ensure that obstetric services and nutritional services do not communicate, and question the way we consider priorities in apportioning services and effort.

Pregnant women and their foetuses are clearly at very high risk; indeed, maternal death may be more common than death due to severe malnutrition in some least-developed countries. I maintain that all pregnant women, but particularly those with high-risk pregnancies, should have facilitated access to adequate antenatal care; provision of high-quality nutrition (including but by no means limited to iron and folic acid that is typically provided as part

of ANC) to support the pregnancy should be part of this care. The dispensing of the supplementary food should therefore NOT be in an SFP alongside the malnourished children, but should be run by the obstetric services themselves, independent of the services for malnourished children. At a minimum, the supplement should be given to ALL high-risk pregnant women. However, just as the school feeding programme was instituted mainly to encourage children to attend school as well as improving their nutrition, supplementary food should be used to encourage all pregnant women to attend antenatal clinic and to attend early and regularly. Indeed, the sections on pregnancy (preventive) should be removed from guidelines aimed at treatment for the malnourished and instead transferred to, and emphasised in, obstetric (and follow-up) guidelines.

Who should be given what ration? There are well established and universal obstetric factors that increase the risks of pregnancy. Infections during pregnancy, such as malaria, have a profound effect on birth weight. There is indeed some evidence that a low MUAC is associated with a slight reduction in birth weight, although most studies did not undertake multivariate analyses (Ververs et al, 2013) and there are a number of studies that found no effect of moderate deficits in anthropometry on pregnancy outcome; short maternal height was a risk factor. Table 1 lists the criteria that I think should be used by the obstetric services to entitle at-risk mothers to receive *highly fortified* blended food throughout pregnancy; Table 2 outlines suggested criteria for supplementation during lactation. However, a strong argument could be made for giving a simpler (cheaper) ration to all pregnant women, along with micronutrient supplements. This could, at least, help reduce low birth weight, anaemia and pre-eclampsia in the mother (Bhutta et al, 2014). However, antenatal care attendance also has the benefits that conditions such as pre-eclampsia, gestational hypertension, polyhydramnios, malaria, HIV, syphilis, multiple foetus, cephalo-pelvic disproportion, antenatal bleeding (e.g. placenta previa), breech presen-

tation, etc. could be diagnosed and managed appropriately. These complications in pregnancy are much more dangerous for the mother and foetus/infant than a mild anthropometric deficit; moreover, type I nutrient deficiencies, which are particularly prevalent and damaging to the foetus, do not result in an anthropometric deficit (Golden, 1991). There may well be a role for additional anthropometric criteria, like MUAC, that could be undertaken by midwives (who already measure weight) to triage different nutritional interventions; however, the key development needed is for the organisation of services to be located within obstetric services.

Those who have received supplementation during pregnancy and all those with a low birth weight infant or have had such complications as an excessive blood loss during delivery or have signs of micronutrient deficiency should continue to be supplemented during lactation.

Many deaths of mothers actually occur in the post-natal period secondary to infection, eclampsia and secondary haemorrhage, which is usually due to retained infected placental tissue or endometritis. Nutrition support in the postnatal period would provide an opportunity for postnatal care (for a minimum of six weeks) and assessment of the nutritional state and growth of the baby with hopefully early detection of nutritionally vulnerable infants.

It is likely that much of the damage done to the foetus through maternal malnutrition has its greatest effect in the peri-conception period and during the first trimester (e.g. as reflected in the follow-up data from the Dutch famine during the latter part of the Second World War), and supplementation during this period has a major effect upon the foetal epigenome (Khulan et al, 2012). This indicates that an additional major focus of nutritional support should at least include pre-pregnant adolescent females. Attendance and supplementation through the antenatal clinic should be as early in pregnancy as possible.

In summary, UNICEF, WFP and WHO – the international agencies already involved in

support of nutrition for pregnant women in least-developed countries – should work closely with the United Nations Population Fund (UNFPA) and national obstetric services to develop an entirely new (preventive) Antenatal-Nutrition Programme (ANP), with appropriate protocols, training, staff and products (including adequate amounts of all type I and type II nutrients). Such a programme should be incorporated into the obstetric protocols and guidelines and removed from the standard nutrition protocols and health-related protocols derived from disaster/emergency response documents. To fail to prepare is to prepare to fail...

For more information, contact: Michael Golden, Pollgorm, Ardbane, Downings, Co Donegal, Ireland, email: mike@pollgorm.net

If you'd like to share your views on this topic, we welcome letters to *Field Exchange* or post your comments on en-net, www.en-net.org; any en-net discussions will be summarised in a future *Field Exchange* edition.

References

- Blencowe H, Cousens S, Jassi FB, et al. *National, regional, and worldwide estimates of stillbirth rates in 2015, with trends from 2000: a systematic analysis* Lancet Global Health 2016;4: e98–108 [http://dx.doi.org/10.1016/S2214-109X\(15\)00275-2](http://dx.doi.org/10.1016/S2214-109X(15)00275-2)
- Ververs M, Antierens A, Sack A, et al. *Which Anthropometric Indicators Identify a Pregnant Woman as Acutely Malnourished and Predict Adverse Birth Outcomes in the Humanitarian Context?* PLOS Currents Disasters. 2013. Edition 1. doi:10.1371/currents.dis.54a8b618c1bc031ea140e3f2934599c8
- Bhutta ZA, Das JK, Bahl R, et al. *Can available interventions end preventable deaths in mothers, newborn babies, and stillbirths, and at what cost?* Lancet 2014; 384: 347–70 [http://dx.doi.org/10.1016/S0140-6736\(14\)60792-3](http://dx.doi.org/10.1016/S0140-6736(14)60792-3)
- Golden MH. *The nature of nutritional deficiency in relation to growth failure and poverty.* Acta Paediatr.Scand.Suppl. 374, 95. 1991 www.researchgate.net/publication/269809264
- Khulan B, Cooper WN, Skinner BM, et al. *Periconceptional maternal micronutrient supplementation is associated with widespread gender related changes in the epigenome: a study of a unique resource in the Gambia.* Human Molecular Genetics, 2012, Vol. 21, No. 9 2086–2101 doi:10.1093/hmg/dd5026
- UNICEF 2015. *The State of the World's Children 2015: Rethink the Future.* www.unicef.org/publications/index_77998.html

Table 1 Suggested indications for fortified blended food supplementation during pregnancy

- Primigravida / primipara (1st pregnancy)
- Grand-multipara (≥5children) (from 2nd trimester)
- Teenagers (puberty to <18yr)
- Twin pregnancy
- Previous abortion/stillbirth/low birth weight infant/caesarean/prolonged labour (>24h primipara, >12h multipara) /serious infection
- Any other complication of this or the last pregnancy, e.g. severe anaemia, malaria, pre-eclampsia (hypertension, proteinuria), hyperemesis gravidarum, night blindness
- HIV positive – or any sign of immuno-incompetence (e.g. candidiasis)
- Interpregnancy interval < 18 months
- Goitre
- Any other sign of micronutrient deficiency Underweight/thin mothers – MUAC <21cm or <23cm (criteria not established). Note that severely malnourished mothers (MUAC < 16cm) should be referred and receive the same treatment as for all adults with severe acute malnutrition.
- Short mothers (<150cm)
- Poor weight gain during pregnancy (only 2nd/3rd trimester)

Table 2 Suggested indications for fortified blended food supplementation during lactation

- ALL mothers who qualified for supplements during pregnancy (see Table 1)
- Mothers whose infant was low birth weight (<2.5kg = premature or intrauterine growth retardation IUGR)
- Any complication of the delivery, e.g. excess bleeding (>500ml)
- Any sign of micronutrient deficiency
- Mothers whose infants have been treated using the supplementary suckling (SS) technique to re-lactate
- Other mothers whose infants are not gaining weight adequately
- Mothers who are specifically referred for additional supplements by an infant and young child feeding (IYCF) programme



Integrating nutrition and antenatal care

A reproductive health perspective

By Sarah Neusy

Sarah Neusy is an Obstetrician-Gynecologist and Reproductive Health Advisor with Save the Children UK.

I read with a great interest Mike Golden's article¹. His view makes a lot of sense and it is refreshing and somehow hopeful to see this kind of global understanding of (reproductive) health coming from the nutrition world.

Indeed, I am concerned by the segregation between health and nutrition sectors that can exist in the field during emergency responses. Without having real expertise in nutrition myself, it is clear that it is impossible to be in good health without being well-nourished, and no improvement of a patient's nutritional status will be reached if the associated disease is not taken care of too. The nutritional status and micronutrient deficiencies of the pregnant woman affect directly the foetus, and therefore the newborn birth weight and child health, as well as the mother's own chances of survival. Antenatal care consultation (ANC) provided to the pregnant woman by a skilled staff, starting during the first trimester, and continued through the nine months of pregnancy, is of paramount importance to prevent maternal mortality and morbidity. This will allow skilled health staff to identify early danger signs related to pregnancy and to refer or follow the woman accordingly.

Some aspects of the nutritional status of the pregnant woman are already taken into account by the midwife during an ANC visit. Anthropometric measurements of the pregnant woman are indeed part of the midwife's tasks during the first visit. Weight and height will be measured and followed during pregnancy; through the mother's weight gain, midwives will follow the mother's health and foetal growth. From these measures, they will also be able to predict any foetopelvic disproportion leading to potential life threatening situations for both and refer the woman, as appropriate, for caesarean section. The mid-upper arm circumference (MUAC) measure could be taken too during the first ANC visit.

Each pregnant woman will also be dewormed and supplemented with oral iron (Fe) to fight anaemia (low haemoglobin level (Hb)); 1 month Fe supply is usually provided, to encourage the woman to attend ANC the following month and take more supplies. In 80% of cases where mortality occurs, pregnant women will die around delivery time and mostly from haemorrhage. In Niger,² for example, the average number of children per woman is seven, and many girls are married at 12 years old with the prospect of a multitude of potentially life threatening obstetric com-

plications. Chronic anaemia, and chronic severe anaemia (Hb<7g/dl), are very common, resulting from this high number of pregnancies (acute blood losses) as well as infectious diseases (malaria) and a poor quality diet. The most serious complication arising from chronic anaemia is tissue hypoxia, which can lead, with the next blood loss or the next malaria crisis, to decompensation, multiple organ failure, shock and death of the woman.

Here are some examples to illustrate the importance of ANC during pregnancy as a mean to decrease maternal mortality and morbidity, as well as nutrition aspects already integrated within sexual and reproductive health activities. So advocating for women's nutrition to be further integrated into sexual and reproductive health (SRH) clinics makes perfect sense to me. The need for a multidisciplinary approach is already a concept that should be part and parcel of every SRH team; the midwife, the obstetrician-gynaecologist or the doctor with obstetrical skills, the psychosocial worker or psychologist (for sexual and gender based violence cases, for instance), all working together to offer a full spectrum of care to the woman... a nutritionist could easily supplement this core team, overseeing maternal nutrition and ensuring the communication and referral mechanisms with the co-existing nutrition programme if needed.

It is also clear that in resource-poor settings, in order to increase the uptake of ANC services by women, it is important to think about how to make the service more accessible. The distances to the clinics or hospitals may be large and the roads very difficult to walk. Going to a supplementary feeding programme (SFP) one day and to the ANC clinic the day after might prove too time-consuming, forcing women to choose one over the other.

Combining feeding programmes with SRH programmes during emergencies, allowing mothers to be cared for at the same time and same place as their malnourished children even if taken care of by different teams, will lead to a comprehensive package of care and will improve both mother and child health.

For programmes on infant and young child feeding in emergencies (IYCF-E) especially, combining IYCF-E activities with basic SRH activities, in one package of care, and within the same team and location is feasible and should be the way forward. Mothers will prioritise their child over their needs if time is scarce. This situation is evident in the current

European refugee crisis where rapid transit schemes were established up until March 2016, all along the refugee's route from the Greek islands to Germany. In these centres, refugees had only a few hours to access services. Implementing basic SRH activities³ inside the 'baby corner' area where the IYCF-E activities were taking place, would allow the woman to care for her child, receive counselling for feeding practices and undergo ANC or postnatal visits. She could also seek family planning support and report any worrying acute symptoms like blood loss.

In order to enable this, one trained midwife would need to be included in each IYCF-E counsellor's shift; she would be part of the nutrition counselling team. Indeed, midwives are already trained to answer questions about breastfeeding and would only need one training about IYCF-E specificities to have this dual role. Medical and non-medical supplies required are relatively limited and the budget needed to implement the SRH component would be very small. I recently attempted, with my nutrition colleagues at Save the Children, to secure support for such a combined programme during the European migrant crisis; it proved unsuccessful as the RH component was not considered a priority for support in a nutrition-orientated programme.

I really believe that the way we tend to separate (reproductive) health and nutrition programmes make no sense from a medical and humanitarian point of view. Large agencies and donors should be more flexible and adaptable when it comes to complex humanitarian situations. Although, to be fair, it is my experience that it is also difficult to implement integrated programmes in relatively small organisations. There are operational challenges to implementing integrated programming but they can be overcome with easy solutions; the more examples of successful integrated programming we can share, the more likely it is that agencies will begin adopting this more common sense approach.

For more information, contact: Sarah Neusy, email: S.Neusy@savethechildren.org.uk

¹ Golden, 2016. Food for thought: Supplementary feeding programme or 'antenatal feeding programme' for pregnant women. Field Exchange 53, May, 2016

² Personal experience working as obstetrician in a referral hospital in Dakoro (Maradi Region, Niger).

³ Basic SRH activities imply ANC, PNC (postnatal care), family planning methods provision, active screening for sexual violence victims and proper referral to health system for holistic management, and syndromic treatment of minor gynaecological infections



WFP, Rein Skallerud, Rajasthan, 2004

Severe acute malnutrition management in India's children

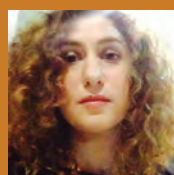
The riddle

By Anne-Dominique Israel de Monval and Yara Sfeir



Anne Dominique Israel de Monval is a senior nutrition and health advisor with ACF France. She holds a nursing degree and a Master's

in Public health. She has more than 13 years' experience with ACF in the field of health and nutrition in Africa and Asia. She is actively involved in the Global Nutrition Cluster and the CMAM forum. Her programmatic interest extends to developing a health system strengthening approach with the objective of integrating nutrition into health.



Yara Sfeir has been Regional Nutrition and Health advisor for Asia with ACF France for the past three years, providing technical

support to ACF nutrition and health teams in Bangladesh, Myanmar, India, Indonesia, Nepal and Ukraine. Having worked in public health nutrition in a variety of contexts, she joined ACF five years ago, working initially on the global SMART initiative with ACF Canada.

Globally, an estimated 52 million children under five years old are acutely malnourished; 70% of them live in Asia, mostly in South-Central Asia (UNICEF, 2012). The India National Family Health Survey (NFHS 3, 2006) states that 20% of children under five in India are wasted, translating into an astounding 25 million acutely malnourished children in India alone – half the global burden. In an attempt to determine whether economic growth is associated with reduction in child undernutrition in India, a review conducted by researchers from Harvard concluded that economic growth did not help in reducing undernutrition (Subramanyam et al, 2011). Despite economic growth and a number of schemes put in place by the Indian government, such as the Integrated Child Development Services (ICDS) scheme, which provides food and primary healthcare to all children under six years old, little or no improvement has been seen in the numbers of wasted children in India in recent national surveys.

In India, the inpatient model for treatment of severe acute malnutrition (SAM) is still the only model approved at the national level. To date, just a few states have opened up to the community-based management of acute malnutrition (CMAM), such as Rajasthan and Odisha. Inpatient facilities to treat SAM children in India are often called Nutrition Rehabilitation Centres (NRCs) or Malnutrition Treatment Centres (MTCs). Recently, data from a number of different studies shows that this model of treatment has not been performing adequately.

This is reflected in Table 1, a compilation of information from five different studies in India. It shows that the recovery rates of SAM children attending the inpatient facilities are still low and the defaulter rate is high when compared to the acceptable minimum standard. The recovery rate varies widely in India from state to state and can be as low as 37%. In all the studies, the recovery rate was well below the 75% standard set by SPHERE. This confirms the well-recognised urgent need to revise and update the model of SAM management in India.

One of the likely reasons for the poor programme performance is the well-documented challenge for mothers to attend facility-based treatment. Internationally accepted WHO home treatment protocols that rely on the use of Ready to Use Therapeutic Food (RUTF) are very challenging to implement in India, as RUTF availability and use is limited to one or two states. There are a number of reasons for this: RUTF is expensive to produce, expensive to buy and requires advanced food technology skills and resources for production. None of these problems is, however, insurmountable. In addition, there has been longstanding opposition from activists in India to the use of RUTF due to a fear of a 'commercialisation of undernutrition'. Articles have been written advocating for home-based food production as an answer to the problem of undernutrition in India. The other solution put forward by some has been to double the ration for SAM children in the government food scheme; while well intentioned, such an approach has not been tested

Table 1 Compilation of data from five studies on the efficacy of the inpatient based management of acute malnutrition

Indicator	Nutrition Rehabilitation Centre (NRC) efficacy	SPHERE standard	Interpretation
Recovery rate	37.1% to 65%	>75%	POOR
Mortality rate	0% to 2%	<10% minimum, <5% good	GOOD
Defaulter rate	18.4% to 57%	<15%	POOR

Sources: Kapil & Sareen, 2014; Singh et al, 2014; Taneja et al, 2014; Dasgupta et al, 2014; Garg et al, 2013

and may be dangerous for SAM children. The activists are well intentioned and fear corruption; however there is a clear need for a very special diet in the treatment of India's SAM children. There is also a demand for context-specific evidence and various trials are underway in India; experiences emerging from one in the tribal area of Melghat, central India, feature in this edition of Field Exchange.

Alternatives have been – and continue to be – investigated. One study looking at whether home-based food would be a possible alternative to manufactured RUTF concluded that “home-based management using home-prepared food and hospital-based follow-up is associated with sub-optimal and slower recovery” (Gupta et al, 2010). One of the challenges is finding a home based diet that can replicate RUTF. Furthermore, there is the risk of food contamination and over dilution. In addition, mixing the ingredients two or three times a day requires additional resources and preparation time for the caregiver. Other solutions are being explored, such as small-scale local RUTF production units. However, the magnitude of the problem in India requires a solution that can also be implemented at scale. Production of therapeutic food through local women self-help groups is being investigated but experiences show variable safety of the product's microbial content. On balance, the best

approach could be to advocate for local large-scale production of RUTF (government or private sector-owned). This would address concerns over microbial safety, incorrect dilution and opportunity cost for home producers. RUTF is ready packed and is easier to transport. Furthermore, it could be picked up weekly at health centres and lead to an increase in the geographical coverage of SAM children treated.

So what now? The government of India is currently working to improve the protocol for the management of SAM. National guidelines on CMAM are drafted and currently being re-

viewed, for release soon. Today, a number of states are starting to allow the controlled use of RUTF. In the years to come, more SAM children will be treated at home in India through take-away RUTF and medicine, as practised in many countries already. India's biggest challenge now is to resource and manage this transition at scale within its health system. Since India has a long way to go down this road, it will be interesting and informative to watch as this story unfolds.

For more information, contact: Yara Sfeir, email: ysfeir@actioncontrelafaim.org

References

- Dasgupta R, Ahuja S, Yumnam V. *Can nutrition rehabilitation centers address severe malnutrition in India?* Indian Pediatr. 2014 Feb;51(2):95-9.
- Garg A, Badgaiyan N, Singh K. *Integrated program achieves good survival but moderate recovery rates among children with severe acute malnutrition in India.* Am J Clin Nutr. 2013 Nov;98(5):1335-42. doi: 10.3945/ajcn.112.054080.
- Gupta P, Shah D & Sethi K. *Home-based rehabilitation of severely malnourished children in resource poor setting.* Indian Pediatr. 2010 Aug;47(8):694-701.
- Kapil U & Sareen N. *Management of children with severe acute malnutrition.* Indian Pediatr. 2014 Jul;51(7):587-8.
- NFHS 3, 2006. Ministry of Health and Family Welfare, Government of India. *National Family Health Survey (NFHS-3)*, 2005-2006. Mumbai, India: International Institute of Population Sciences.
- Singh K, Badgaiyan N, Ranjan A, Dixit HO, Kaushik A, Kushwaha KP, Aguayo VM. *Management of children with severe acute malnutrition: experience of Nutrition Rehabilitation Centers in Uttar Pradesh, India.* Indian Pediatr. 2014 Jan;51(1):21-5.
- Subramanyam MA, Kawachi I, Berkman LF & Subramanian SV. *Is Economic Growth Associated with Reduction in Child Undernutrition in India?* PLoS Medicine. March 2011, vol 8, issue 3.
- Taneja G, Dixit S, Khatri A, Yesikar V, Raghunath D & Chourasiya S. *A study to evaluate the effect of nutritional intervention measures on admitted children in selected nutrition rehabilitation centers of Indore and Ujjain divisions of the State of Madhya Pradesh (India).* Indian J Community Med. 2012 Apr;37(2):107-15. doi: 10.4103/0970-0218.96096.
- UNICEF 2012. *UNICEF-WHO-World Bank Joint Child Malnutrition Estimates.* (UNICEF, New York; WHO, Geneva; The World Bank, Washington, DC; 2012.

Letters

The hard face of resilience and accountability

Dear Editors

This issue of Field Exchange summarises an article that I authored (The 2001-03 Famine and the Dynamics of HIV in Malawi: a Natural Experiment) which suggests that the Famine had much wider impacts than currently understood. In rural areas, HIV prevalence was found to have increased through the Famine and most sharply in districts where hunger was greatest. This is consistent with contemporary accounts of women and girls being pushed further into survival sex to provide food for their families. In urban areas, HIV prevalence was found to have decreased through the Famine and most sharply where hunger in the surrounding rural district was greatest. Difficult to make sense of at first, the finding is consistent with accounts from the time, of people migrating in search of food and work to towns and cities and to less affected rural areas. Because HIV prevalence was lower in rural villages than in the towns and cities, the more rural women and girls were pushed by hunger into moving, the more HIV prevalence would fall in the urban places where they landed. The article suggests that the migrants, who were mostly young and poorly educated, were at greater risk of HIV in this new setting than they had been in their villages.

This study is of more than historical interest. In Malawi and the southern African region, now, as 15 years ago, food prices are rising steeply after failed harvests in the wake of flooding and drought attributed to El Niño. Reports are coming in of increasing numbers of people resorting to extreme coping measures such as survival sex. History never repeats itself verbatim but the article and the accounts it drew on can serve as a baseline against which change can be assessed. Are Malawians now more resilient to climatic shocks? Specifically, is the response of institutions – at all levels – to rising hunger better prepared and informed than it was in 2001-03? Have the structural features of economy and livelihood altered so that people have more diverse and robust options to fall back on when the main harvest and the principle staple – maize – fails?

In late 2001, I met a group of young women near Zomba after a village meeting that had been considering what could be done to counter the growing crisis. They had presented a plan to grow vegetables to sell to a nearby college and asked for the leaders' support in obtaining a treadle pump from a Ministry programme. They were unsuccessful. One

woman recounted that after the last meeting, she had been offered 30 kwacha for sex. Another said she had been offered 25 kwacha. “Screwing to die”, they called it. For them, the links between growing food and guarding their own and their family's health were crystal clear. They and possibly their daughters might ask: Are our efforts now better supported by the village and the Ministry? That is the hard face of both resilience and accountability.

We have to learn better and quicker from disasters and extreme events more generally because they are likely to become more frequent and damaging. One of the advantages of a natural experiment at scale, such as the article presents, is that the “intervention” (the Famine) and its context, as well as its outcomes and at least some of its impacts, are public knowledge and a shared experience. The humanitarian sector has developed something of a habit of reflection using tools such as After Action Reviews. For resilience to really mean something, this kind of reflection has to be widened to embrace development and broadened to involve the many actors who contribute to it.

Yours,

Michael Loevinsohn



Save the Children's IYCF-E Rapid Response in Croatia

Counselling in one of the MBAs during a time of rapid processing

By Isabelle Modigell, Christine Fernandes and Megan Gayford



Isabelle Modigell is the IYCF-E Adviser for the Technical Rapid Response Team (Tech RRT) at Save the Children. She has

a public health background and has been involved in Save the Children's humanitarian programming since 2012 in a variety of contexts and countries. From September – December 2015, she was the IYCF-E Programme Manager in Croatia.



Christine Fernandes is the Global IYCF-E Adviser for Save the Children UK. She has a background in maternal, infant

and young child nutrition and has been working solely in humanitarian contexts (IYCF-E) since 2011. In September 2015, Christine deployed to Croatia to advise on the initial IYCF-E response and set-up.



Megan Gayford is the Senior Humanitarian Nutrition Advisor for the Save the Children UK and has been closely involved in the

Europe response as the nutrition technical backstop for Save the Children. Prior to her relocation to London, Megan worked in country and regional level humanitarian nutrition roles for UNICEF, UNHCR and WFP.

Location: Croatia

What we know: Meeting the needs of infants and young children in transit populations is challenging due to limited contact time and unpredictable population movement and service needs.

What this article adds: In Spring 2015, Save the Children launched a frontline response to support infant and young child feeding (IYCF) as overwhelming numbers of migrants arrived at the Croatia/Serbian border. Initial mobile, reactive basic mother and baby areas evolved to include support in transit centres targeting breastfed (basic, rapid counselling) and formula-dependent infants up to 12 months of age (powdered and eventually ready to use infant formula (RUIF) supplies). Interim guidance on IYCF-E specific to this context was developed in October 2015 at global level due to an identified guidance gap which informed the response. Lack of coordination hampered IYCF response; it made it difficult to halt untargeted distribution of infant formula supplies, establish RUIF supplies, and ensure consistent, appropriate messaging and programmes. Complementary foods were dominated by donated, nutritionally limited supplies; UNICEF/NGO supplies were eventually established. Lessons learned include the importance of strong coordination, preparedness (e.g. stock and kit prepositioning, capacity mapping) and the need for clarity regarding target age for infant formula when in common use.

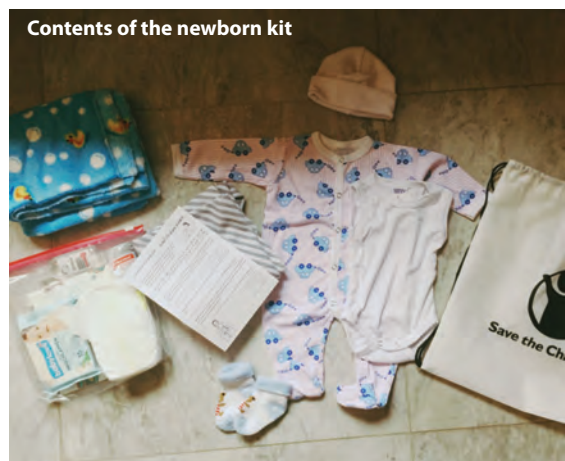
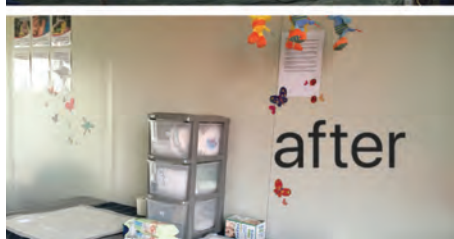
In the Spring of 2015, the number of refugees and migrants arriving in Europe began to unexpectedly and significantly increase. Many were Syrian refugees crossing the Mediterranean Sea from Turkey (alternative routes were riskier), routing from Greece, through Macedonia, Serbia and on to Northern and Western Europe. In mid-October, Hungary closed its borders with Serbia, redirecting flow towards Croatia's Eastern borders. Within days, thousands of men, women, and children amassed in the 'no man's land' between the borders of Serbia and Croatia. The majority of Croatian/Serbian border crossing points were rapidly closed off. Immigration police were completely unprepared for the sheer volume of people and their vast needs; border crossing points (that randomly opened and closed) were rapidly overwhelmed by arrivals of up to 8,000 people per day.

Programme context and challenges in Croatia

The SC team was mobilised and began to work as frontline responders within days of the first arrivals. It quickly became apparent that the immediate needs of infants and young children and their caregivers were physical first aid and protection, psychosocial support and IYCF support. Waiting times at the border were long – up to one day and often well into the night. Large crowds were exposed to sun, wind and rain resulting in heat stroke, heat exhaustion, fainting and hypothermia depending on weather conditions. In the larger border crossing areas, crowds blocked four lane highways, backing up kilometres of trucks into Serbia. Different border crossings opened and closed on a daily or half daily basis with no advance warning. Responding to needs required operating at different, ever-



MBA tent signs during the first days of the response



Isabelle Modigel, Croatia, 2015

changing locations. The Save the Children (SC) teams relied on the same social media resources as the refugees, scanning Facebook and Twitter to find out which border points were open and where response was needed. In order to deliver timely and appropriate infant and young child feeding (IYCF) services in this context, SC needed to be highly mobile, able to rapidly set up, provide priority IYCF services and dismantle to be ready for the next location.

In the initial weeks of programming, mothers were evidently in distress and facing significant barriers to safely and adequately feed their children. Most were inappropriately dressed for the wind, rain and eventual snow, having either lost their belongings along the journey or having left home unprepared. Volunteers threw water bottles into crowds and handed out infant formula. Mothers were observed feeding cows' milk to infants under six months of age, not measuring the quantities of water and powdered formula to prepare a feed and using dirty feeding bottles.

Long hours of waiting in the heat or cold without any information often resulted in tensions and occasional violence and injuries – with teargas being deployed on one occasion. Exhausted mothers stood in the jostling crowds holding often wet, cold, and dirty children in one arm while balancing their belongings in the other. Privacy was non-existent, making breastfeeding an uncomfortable experience. Women minimised their fluid intake as there were initially no toilets at the border crossings. Combined with severe stress, exhaustion, constant movement and a lack of support, SC was concerned that mothers were breastfeeding less frequently and for shorter durations. Many mothers were observed both breastfeeding and formula feeding their infants (also found in assessments in Serbia (UNICEF, November 2015) and Greece (SC, Feb, 2016).

The initial Save the Children response

SC responded by providing basic, temporary Mother & Baby Areas (MBAs). These tents, stocked with practical supplies¹ such as baby clothing, drinking water, cups and cleaning equipment, provided some respite for parents and children, a sheltered area to change their

infant's clothes, and privacy to breastfeed. Skilled IYCF counsellors and sufficient translators were not initially available so the focus was to meet basic needs and create an enabling environment to allow mothers to feed and care for their children. During this early phase, there was no provision of infant formula supplies. Mobility, changing locations on a half daily basis and operating 24/7 was unique to SC's Croatia response during the first phase. Mobile MBAs (using vans and cars) allowed IYCF teams to respond to hotspots. Throughout the day and night, we provided reassurance when possible and assisted those who became unwell. A big part of the initial response involved going through the crowds with water, paper and crayons to help identify waiting children and invite their families to a place away from the crowds. In order to take them to the MBA, special permission was needed from the police every time. Our response was made possible through strong, interagency collaboration, particularly with UNHCR, MSF, and the Croatian Red Cross. For example, SC often set up the MBA near the UNHCR screening point for vulnerabilities or near MSF's treatment area, because our target population naturally congregated in these areas and for ease of referral.

Initially it was unclear what Croatia's government response would be. However, within days, people arriving were transported to the rapidly set up Opatovac Transit Centre. SC's focus became divided between responding to informal settlements at the border and setting up IYCF in emergencies (IYCF-E) services within the transit camp.

Second phase of response

SC began to establish an IYCF-E programme targeted at infants (0 – 12 months) and young children (12 – 24 months) and their caregivers that focused on:

1. Protecting, promoting and supporting breastfeeding
2. Identifying, protecting and supporting infant formula dependent infants
3. Managing the sourcing and provision of infant formula to ensure the needs of both breastfed and non-breastfed infants were protected and met
4. Securing access to nutritionally safe and adequate complementary foods for children 6 – 24 months

Our first action in Opatovac was to engage with medical service providers and the Croatian Red Cross to halt the untargeted distribution of infant formula. In collaboration with UNICEF and Croatian organisations, a simple MBA was rapidly set up in a 20 foot shipping container. Space constraints were a major challenge. Temperatures had dropped drastically and doctors reported that up to half of the babies had worryingly low body temperatures; thus the MBA offered a heated place for caregivers to change their babies as well as a private space to breastfeed. Caregivers requesting infant formula were referred to the nearby paediatric services, which had been agreed upon as the sole distribution point. Here, a medical non-governmental organisation (NGO), provided powdered infant formula and basic bottle cleaning for one-time feeds (refilling bottles). The provision was very donation dependent and not Code compliant. Later, the NGO decided to distribute new bottles and pacifiers.

Management of Breast Milk Substitutes (BMS)

Requests for infant formula were extremely common. Approximately half of the population were from Syria, with smaller numbers from Afghanistan, Iraq and other countries. With the introduction of selective entry procedures mid-November 2015, only persons from these three countries were granted entry into Croatia. Pre-crisis data from Syria showed low exclusive breastfeeding rates (43% of infants under 6 months) and low continued breastfeeding rates (23% at 2 years) (UNICEF State of the World's Children Report, 2012).

Despite initial success in halting untargeted distribution of infant formula, it remained a challenge to convince other actors to not distribute untargeted infant formula, bottles and pacifiers. A vast variety of powdered infant formula (PIF) was initially provided without any accompanying counselling or equipment to support hygienic preparation. Sanitation was often poor and access to boiled water very limited, resulting in incorrect and unsafe formula preparation. The

¹ MBA specification: 9m² gazebo with sides, a picnic table, collapsible seating, a handwashing station, lighting, and cleaning equipment. Stocks: nappy changing supplies, warm baby clothing and blankets, disposable raincoats, stationary, drinking water, cups and hygiene supplies



A selection of donated bottles typically in circulation

response was largely staffed by first time volunteers from all over Europe with very high turnover. Health providers were particularly difficult to convince to follow WHO protocols, wanting more evidence/data/research on the risks associated with infant formula in this context. Volunteers had less knowledge but responded well to advocacy and were more willing to change their actions. Advocacy with one NGO led to their employing rapid screening before provision of infant formula. We advocated to Red Cross camp management to better monitor the distributions, but due to high staff turnover, this was difficult to sustain. SC recognised the need for targeted infant formula supplies and opted to procure Ready to Use Infant Formula (RUIF), as a less risky (it is a sterile product until opened and does not require reconstitution with water) though more costly option (RUIF is roughly 2.5 times the cost of PIF). It took three months to secure a supply was procured from a manufacturer in-country and relabelled by SC in Arabic, Farsi and English. No supplies were available via UN agencies.

SC was the only actor present with IYCF-E expertise on the ground, however several other actors were involved in BMS management. Whilst the establishment of an IYCF technical working group (TWG) in early December 2015 helped to generate some consensus and standards, it lacked authority; the absence of a formal humanitarian coordination system meant leadership and accountability were lacking. Having RUIF supplies strengthened SC's advocacy position as it offered a safer alternative for formula dependent infants. In addition, SC along with key partners, were drafting interim guidance on IYCF for transit populations², which helped to coordinate and agree upon protocols for IYCF programming.

Complementary feeding

The initial humanitarian response did not source supplies of complementary foods and no dairy products were allowed inside the camps by the MOH in the first and second phases, especially during the time of rapid processing. When the borders closed, partners began distributing cow's

milk for older children and subsequently, some people were allowed to purchase milk at the supermarket/shop outside the Transit Centre. There was a significant lack of suitable and adequate complementary foods along the migration route; commercial baby foods were most common, mainly protein-poor pureed fruit and vegetables. Many violated the Code (e.g. labelled as suitable for infants aged 4 months and above; not in appropriate language) and families were concerned that meat containing products were not halal or contained pork. Much was abandoned and discarded. There were vast quantities of donated commercial baby foods that were widely distributed. At one point, a well-known supplier of baby foods pushed to donate 5.5 metric tonnes of jarred baby foods nearing their expiry date.

Around December 2015, UNICEF and a medical NGO began distributing complementary food packages for age groups 6-9m, 9-12m, and 12-36 months. Each contained two sachets of Plumpy'Sup, two jars of commercial baby food (one fruit based, the other animal protein based), a biscuit for the 12-36 month group, baby wipes and plastic spoons. The Red Cross general food distributions included apples and oranges. There was no micronutrient supplementation. SC investigated relabelling baby food jars but this proved too costly and time consuming.

Until safe, acceptable and nutritionally adequate foods that could be consumed on the move were identified, it was agreed by the TWG to provide infant formula for non-breastfed infants up to 12 months of age. Caregivers were counselled on complementary feeding for children 6 – 24 months focused on what foods were available and how to manage on their onward journey. For breastfed infants, continued breastfeeding was strongly encouraged. Sometimes donated baby foods were used with information on their limitations. Caregivers were quick to dismiss the unfamiliar products provided in the UNICEF/Manga packages, but were encouraged to use them in the absence of alternatives (children were observed to accept them well). There was very limited contact time so counselling was focused on addressing immediately relevant, practical issues.

Challenges of IYCF-E in a transit setting

Minimal contact time

The government's approach to minimise transit times hindered humanitarian assistance and meant many could not access needed support or rest. Caregivers were often exhausted and highly stressed by the constant movement, compromising their abilities to care for their children or process information. The fast moving pace also meant families were concerned about becoming separated, for example by a visit to health services or the MBA. We addressed this by coming to an agreement with the police to allow the remainder of the family to stay in a waiting area we installed. However, the high turnover of different police units and fluidity of

the situation meant these agreements had to be repeated on an almost daily basis.

During the short stay in the transit camp, caregivers had multiple needs to address in a very limited time – including food, hygiene, changing their baby's clothing and diapers, charging phones and sometimes seeking reunification with separated family members. Stress levels were often further exacerbated by the acute lack of information on when they would leave and what would happen next. As a result, caregivers tended to be very rushed and focused on leaving. Counsellors reassured caregivers that families would not become separated or miss the next train or bus if they stayed in the MBA, and facilitated access to other services. Efforts were made to create a calming and comfortable environment in the MBA. All staff were trained on Psychological First Aid and SC's psychologist was also on hand for those requiring additional support. SC developed kits to provide the essentials quickly; newborn kits, breastfeeding kits, and Ready to Use Infant Formula (RUIF) kits were targeted.

In the first phases of the response, SC's counselling capacity was also limited by cultural and language barriers. SC eventually recruited and trained national Croatian staff to deliver IYCF counselling through translators who also required sensitisation on IYCF-E and counselling skills. However, translators, particularly female, were in short supply and high demand. Only a small number of national breastfeeding promotion organisations exist in Croatia, so we recruited women with strong interpersonal skills and built their IYCF counselling capacity.

Cup feeding

The promotion of cup feeding posed another such challenge given the context. Cup feeding is preferred over bottle feeding because it carries less risk of diarrhoea and other infections in unsanitary environments, as well as increasing bonding and not interfering with breastfeeding (WHO, UNICEF). However, this was a new concept for many and not readily accepted by stressed caregivers, bombarded by a multitude of different information and supplies. Support for transition to cup-feeding was made more difficult by the lack of contact time. If caregivers had run out of formula, as they often had, babies arrived hungry and crying. The provision of bottles and teats by other actors further undermined efforts. Despite these significant challenges, some caregivers readily accepted to try cup feeding (particularly mothers of older infants) and some babies easily adopted the practice; in our view, this made our efforts worthwhile. Showing photos or videos of other babies who are cup feeding successfully was very convincing for parents. Many mothers were already well aware of the need for good hygiene

² Interim Operational Considerations for the feeding support of Infants and Young Children under 2 years of age in refugee and migrant transit settings in Europe. Version 1.0, October 2015. <http://www.enonline.net/interimconsiderationsiycftransit>

– the context simply did not allow them to practice it. When we explained that they could have as many clean cups as they needed, some gladly accepted the offer. Since more infant formula may be spilled during cup feeding when done on the move, adequate supplies of RUIF, plastic bibs (children usually just had one set of clothes) and cups with lids were provided.

Our teams explored cup feeding as a first option whenever possible. However, when the situation did not allow (either due to caregiver refusal or the setting) we also offered bottle sterilisation services; a BMS Management Area, separate from the MBA, was equipped with cleaning equipment that included sterilisers and kettles. While bottle feeding was culturally accepted and has practical advantages in transit, we considered the potential risks of unsterilised bottle feeding (e.g. increased diarrhoea due to poor hygiene) to outweigh the challenges of cup feeding. There were diarrhoeal outbreaks but requests for official data from partners were unsuccessful which meant it was not possible to establish if diarrhoea was related to feeding mode. It is possible that given a more coordinated and standardised response, where only cups were distributed rather than bottles, there may have been more acceptance of cup feeding.

A shift in strategy: return to rapid processing

In early November 2015, the Croatian authorities closed the Opatovac Transit Centre and SC's operations were shifted to the Winter Reception and Transit Centre (WRTC) in Slavonski Brod. About a month later, further transit developments saw a return to rapid processing and registration of large waves of people. As a result, people no longer entered the sectors in which the MBAs were located and contact opportunities shrunk. The programme thus refocused on meeting basic needs and transmitting key IYCF messages - this time through the distribution of breastfeeding shawls (for privacy) and baby kits which contained hygiene and clothing items, as well as leaflets in English, Arabic, and Farsi. Infant formula was still provided by SC to those identified (only rapid assessment and counselling was possible): RUIF

kits provide formula supply, cups with lids, soap, bib, instruction leaflet and key messages in various languages. Manga continued to provide PIF.

Key learning from the response and next steps

Supporting IYCF requires effective cross border and regional coordination of actors implementing IYCF-E. Our experiences reflect a lack of consistency and standardisation to help caregivers practice safer feeding options, which compromised what could be achieved in terms of minimising risk and supporting safer practices. Caregivers were often tired and confused by the multitude of different actors providing varying messages, IEC materials and products using diverse approaches. Given the severe constraints, the SC approach to counselling was to accept the feeding behaviours of mothers but advise them on how to manage and minimise risks. An effective behaviour change intervention requires consistent messaging over time. This is incredibly challenging in a quick moving population, on different routes and moving across borders to different service providers who are not clearly linked through a referral system up to the final destination.

Coordination in this regional crisis has proved complex, further complicated by political factors, different government priorities and gaps in leadership and technical capacity. This has contributed to slower linkages of services. The diversity of actors, many of which are volunteer groups following different protocols and standards, has added to this complexity in coordination and standardisation of services.

BMS management in non-breast fed infants aged 6-12 months. Whilst there is a clear nutritional need to provide infant formula for non-breastfed infants under 6 months of age, options for suitable feeding support for the non-breastfed child aged 6 to 12 months in transit require further examination. Relactation was not a viable option in this transit context. The prohibited distribution of dairy products by the MOH in phases 1 and 2 meant using cows' milk in non-breastfed infants over 6 months was not an option. While the lack of adequate complemen-

tary foods were the main reason for the decision to provide infant formula up to 1 year, we also considered the stress we would impose on caregivers by refusing to provide formula without having the time to provide an explanation or another suitable food.

Prepositioning of MBA kits and RUIF. Sourcing and replenishing MBA equipment was hugely time consuming during set-up; prepositioned basic kits would have enabled faster response. In addition, adequate supplies of generic (unbranded) RUIF proved extremely difficult to source both locally and internationally; importing stock risked logistical delays. Branded supplies were eventually sourced and relabelled by SC; this proved costly and also raised issues over liability regarding the integrity of label translations. SC has begun to identify and vet regional RUIF suppliers for better preparedness. Lack of a viable UN supply source, as recommended in the Operational Guidance on IFE, hampered responsiveness.

IYCF/IYCF-E Capacity in Europe. The skill-set required for immediate IYCF-E support in Croatia and along the route was very specific: fully trained in IYCF counselling, female, Arabic or Farsi speaking. It would have helped to have mapped existing IYCF actors in the region prior to the emergency. Over time, SC have been able to connect with national stakeholders and breastfeeding organisations, and have now developed a list of local resources to draw upon for a more rapid response.

For more information, contact: Christine Fernandes, tel: +254 (0) 787 777 741, email: c.fernandes@savethechildren.org.uk

Experiences of implementing the 'Interim Operational Considerations for the feeding support of Infants and Young Children under 2 years of age in refugee and migrant transit settings in Europe' are currently being sought by the IYCF-E Technical Discussion Group; a collective of agencies directly involved in the operations in Europe and ENN (representing the IFE Core Group). An online survey is available at: <http://www.en-net.org/question/2493.aspx>

Isabelle Modiguel, Croatia, 2015



Crowds waiting in 'no man's land' at the border where mother-infant pairs had to be identified

Adolescent
mother and
child

Adolescent inclusion in the Care Group approach The Nigeria experience

Shiromi M. Perera, IMC, Nigeria, 2015

By Shiromi Michelle Perera



Shiromi Michelle Perera is a Technical Officer with the Nutrition, Food Security and Livelihoods Unit at International Medical Corps, Washington DC.

International Medical Corps (IMC) received funding from USAID's Technical and Operational Performance Support (TOPS) Program to develop a case study to describe the experience of adolescent girl inclusion in IMC Care Groups in Northern Nigeria. This article summarises the findings of the study.

The TOPS Micro Grants Program is made possible by the generous support and contribution of the American people through the United States Agency for International Development (USAID). The contents of the materials produced under this grant do not necessarily reflect the views of TOPS, USAID or the United States Government.

The author would like to acknowledge the support given by Caroline Abla, Director, Nutrition and Food Security and Livelihoods (NFSL), International Medical Corps; Iris Bollemeijer, Nutrition Advisor, NFSL, International Medical Corps; Amelia Reese- Masterson, Research Advisor, NFSL, International Medical Corps; Nura Shehu, Monitoring and Evaluation Officer, International Medical Corps Nigeria; and Daniel Takea, Nutrition Coordinator, International Medical Corps Nigeria.

Location: *Northern Nigeria*

What we know: Adolescent girls are a nutritionally vulnerable group due to their nutrient requirements for growth; pregnancy heightens demands and increases both maternal and child risks.

What this article adds: The experiences of including adolescent girls in Care Groups (community-based volunteer educators) in northern Nigeria was documented in a qualitative study by IMC involving key informant interviews, focus group discussions and a Knowledge, Attitude and Practice (KAP) survey of adolescent girls in four selected villages. Average age of conceiving the first child was 15 years. Most adolescent mothers were not in formal education and were socially isolated and lacked decision-making power. Through Core Group participation, improved knowledge and practices related to their own and their child's nutrition, health and hygiene were observed. Community and family (especially husbands) buy-in proved critical to including married adolescent girls in Care Group activities. Recommendations include development of adolescent-only sessions, targeting unmarried mothers through home visits, more in-depth support on topics such as pre-conception health and nutrition and identifying new means of targeting girls.

With attention now focused on achieving the Sustainable Development Goals (SDGs), many in the global health community are realising that adolescents need to be a more significant part of efforts. The Care Group approach can be an entry point for appropriately targeting adolescents to achieve improved maternal and child health and nutrition. A Care Group, which is a group of 10-15 trained volunteer, community-based health educators, creates a multiplying effect to equitably reach every beneficiary household through interpersonal behaviour change communication (see <http://care-groups.info/>). Since 2014, International Medical Corps (IMC) has worked to address malnutrition in Nigeria through Care Groups in four local government areas (LGAs) in the northwest state of Sokoto, northern Nigeria. In Kebbe LGA, Phase II of an ECHO-funded programme focused on addressing gaps in women's nutrition through 60 Care Group Lead Mothers supporting 900 mothers in five health facility catchment areas (due to funding cuts, implementation was for three rather than the intended six months). Adolescent girls were included in Care Groups as a pilot with the specific aim to promote optimal birth and health outcomes. This is one of the first times adolescent girls have been actively included in an IMC Care Group model.

Nigeria is a nation of young people, with almost one third of its 158 million population aged 10- 24 years. Early marriage and resultant early childbearing is a significant issue and is usually related to religion, geography, education and economic factors. The majority of girls in rural areas are more likely to be married before the age of sixteen years if they are Muslim and live in northern Nigeria (NDHS, 2014). Early childbearing, as well as rapid repeat pregnancies, when a girl's body is still in the process of maturing, can lead to negative health outcomes for both mother and child, such as increased

risk of obstructed labour, preterm deliveries, stillbirths, low birth weight and maternal and neonatal mortality (WHO, 2005). Adolescents are a nutritionally vulnerable group due to their high energy and nutritional requirements for development; pregnancy further increases this demand. While very little information exists on the nutritional status of Nigerian adolescents, data on adolescent mothers (aged 15-19 years) indicates that 23% are considered thin, 6% overweight or obese, and 5% stunted (low height-for-age) (NDHS 2014). Undernutrition can delay growth and maturation, which further increases the risks associated with adolescent pregnancy (WHO 2005; Bhutta et al, 2013; Black et al, 2013).

Malnutrition has the potential to span generations, whereby undernourished girls give birth to low-birthweight babies, the consequences of which extend into adulthood and thereby create an inter-generational cycle of malnutrition (UN & IFPRI, 2000). To break this cycle, it is critical to improve not only the nutritional status of malnourished adolescent girls prior to and during pregnancy, but also that of their children. Breastfeeding, which has an impact on children's mental and physical development, is nearly universal in Nigeria; however only 17% of children under six months are exclusively breastfed and only 67% of children start receiving complementary foods at the appropriate age of six to eight months. Non-exclusive breastfeeding (with solid food, water and other liquids) during the first six months of life and the lack of appropriate complementary food after six months can increase the risk of illnesses and even mortality in infants. Children's nutritional status has changed minimally over the last decade in Nigeria. The data indicates that almost 29% of Nigerian children are considered underweight. Stunting, which is found in 37% of children under five years old, is more common in rural areas (43%) and most prevalent in the northwest

zone (55%). Wasting (low weight-for-height) is less common (18%) and is most prevalent in the northwest (27%). In the northwest State of Sokoto, the prevalence of stunting is as high as 52%, while wasting is 19% (NDHS, 2014).

This case study describes the results of adolescent girl inclusion in Care Groups, highlighting key learning points (barriers, boosters and best approaches), both for IMC staff who plan to include adolescents in Care Groups, and for the wider food security/nutrition community, in order to tailor programmes more effectively to include adolescent girls and meet their unique needs.

Methods

An assessment team comprised of five local interviewers employed qualitative methods (40 Key Informant Interviews (KIIs) and seven Focus Group Discussions (FGDs)), with key stakeholders. Four villages in the Kebbe LGA, located in the Ungushi, Girkao, Unbutu and Margai Wards, were selected as they had the most adolescent girls involved in Care Groups. (See Table 1).

Tool development was in accordance with standardised guidance on qualitative research tools. Prior to data collection, all staff involved with facilitating and recording FGDs and KIIs underwent a three-day training on FGD and KII methodology, including facilitation techniques, note-taking methods, consent acquisition and ethics of conducting interviews with adolescents. Prior to KIIs and FGDs, verbal consent was acquired from all participants. Study data were translated and transcribed, following which the qualitative data analysis software MAXQDA11 was used to code and analyse all data for themes, sub-themes and quotations of relevance.

In addition to KIIs, Adolescent Key Informants were tested on 18 Knowledge, Attitude and Practice (KAP) questions in order to measure how much they had learned and retained from their Care Group sessions. Topics covered by questions included nutrition (e.g. exclusive breastfeeding, complementary feeding and mixed feeding); hygiene (e.g. hand-washing practices); and health of children (e.g. when to seek health services when child is ill).

Findings

The investigation revealed that the IMC Care Group programme contributed to increased knowledge and improved practices among adolescent girls in a) preventing malnutrition by

maintaining a healthy nutritional status for themselves and their families; b) preventing illness in their households; and c) seeking health services and facilities when necessary. Regarding a), the evidence is based on a mixture of screening (Lead Mothers screen children monthly using MUAC and refer them to the outpatient therapeutic programme where indicated) and observed/reported behaviour change by FGD and KII participants. More specifically, following their participation in Care Groups, adolescent girls had high levels of knowledge on topics such as breastfeeding and complementary feeding practices, maintaining healthy diets during pregnancy, and hygiene practices.

Rationale for targeting adolescents. IMC programme staff explained that while implementing a Community Management of Acute Malnutrition (CMAM) programme in the local government health facilities, it was observed that most of the mothers were adolescents who were on average 17-18 years old and their children had very low bodyweights and were malnourished. Caring practices of children, particularly among adolescent mothers, was found to be very poor compared to older mothers.

Adolescent girl characteristics. Promoters and Lead Mothers indicated that many of the adolescent girls were married by the age of 19 years, gave birth to about six to seven children in their lifetime, and did not practice healthy spacing between each child. Adolescent girls stated they became pregnant for the first time between the ages of 13 and 17 years, with the majority becoming pregnant at 15 years. Only three of the 25 girls had been enrolled in a formal school, one of them attending primary level and the other two attending secondary level.

Recruiting adolescents. The most notable development that Key Informants pointed to was the change in behaviours demonstrated by increasing acceptability among husbands and the community of including married adolescent girls in Care Group activities. Initially IMC field staff had encountered certain cultural and social barriers to adolescent girls fully participating in Care Groups, including their social isolation in household compounds and reduced attendance in social activities and interaction with peers. Access to adolescents was first achieved through buy-in of community leaders for the programme and community awareness efforts through town announcers and community-awareness sessions. Community Health Volunteers (CHVs), who

were part of a previous five-year, USAID-funded, targeted status high impact project (TSHIP) programme and had been trained on maternal and neonatal health, were recruited and trained to be Care Group Lead Mothers. Lead Mothers were members of the communities (grandmothers or mothers) and were therefore highly respected figures. Lead Mothers, at times in coordination with Community Leaders, then set out recruiting mothers through community mobilisation and house-to-house visits, explaining to couples the aim and benefits of the programme and encouraging husbands to provide permission for their adolescent wives to join the programme. Adolescent mothers who were once isolated from social activities and interaction with peers were now encouraged to attend, not miss any sessions and pay close attention to lessons. While this indicates the possibility of change in social and cultural norms, further research is required to confirm such a shift.

Household power dynamics. The majority of husbands were responsible for decisions about types of food to be purchased and types of meals to be prepared. Husbands also made decisions related to childcare, including how to respond to illnesses. Almost all husbands made the decision for their wives to attend Care Group sessions.

Impact on health-seeking behaviours and overall health. Many KII and FGD participants noticed positive changes in health and wellbeing of targeted households. Household meals were described as more nutritious and diverse throughout the day. Health facilities reported to programme staff that they had experienced increases in attendance for antenatal care (ANC), postnatal care (PNC), deliveries and immunisations. Increases have been recorded in the majority of facilities; some as high as 300%. Additional observed/reported changes in adolescents' behaviours and practices include: seeking healthcare when noticing certain signs and symptoms during pregnancy; eating nutritious meals during pregnancy and lactation; early initiation of breastfeeding; practicing exclusive breastfeeding; reduced illness and therefore reduced hospital visits; taking sick children to the hospital without delay; bathing themselves and their children; washing dirty clothes; practicing menstrual hygiene; and hand-washing before eating and meal preparation. There was also an indirect impact on husbands' knowledge and practices related to the types of food they purchased for their households; ability to recognise signs and symptoms of illness; and accessing health services with less reliance on traditional medicine.

Adolescent-only care groups and other recommendations. Ninety-two per cent of adolescent girls and 58% of husbands preferred adolescent-only groups. Due to cultural sensitivities, girls described feeling shy, fearful or uncomfortable in participating in the presence of older members of the group, who were often their relatives. For those who did not agree with adolescent-only groups, their reasoning for continuing with mixed groups were: adolescents could learn from the more experienced older women; and the adult women would force girls to pay

Table 1 Approach and sample

Assessment type	Groups/ key Informants	Number per ward location (n= # of participants)			
		Ungushi	Girkau	Unbutu	Margai
Focus Group Discussions	Care Group Lead Mothers	1 (n=7)	1 (n=6)	1 (n=8)	1 (n=11)
	Husbands of adolescent girls who participated in the Care Groups	1 (n=9)	1 (n=11)	1 (n=7)	
Key Informant Interviews	Adolescent Girls	10	5	5	5
	Care Group Lead	1	1	1	1
	Care Group Promoters	1	1	1	1
	Community Leaders	1		1	1

attention and could help girls later recollect anything forgotten from the teachings. Participants and programme staff suggested that adolescents be given additional information about each of the session topics, since they were so young and new to marital life and motherhood, through extra time after a session or an extra session per week. Increasing awareness among husbands by providing them with weekly sessions was also suggested.

Summary conclusions and recommendations

The following recommendations, based on the key findings and lessons learned, focus on further overcoming barriers for adolescent inclusion in Care Groups and strengthening programme quality.

Overcoming barriers for including adolescent girls in Care Groups

Community and family buy-in is critical when targeting adolescent girls for inclusion in Care Groups. The following recommendations pertain to the 'who' and 'how' of obtaining appropriate buy-in for adolescent inclusion.

- I. Obtain necessary buy-in from critical stakeholders:
 - a) Community Leader's permission for introducing Care Group programming in community;
 - b) Husband's permission for including their adolescent wives in the programme; and
 - c) Permission from mothers-in-law or other heads of households when husbands are away from the village for work.
- II. Develop and utilise appropriate processes for acquiring community and family buy-in:

- a) The use of CHVs as Lead Mothers, who were trusted members of the community, was critical in gaining the buy-in from key stakeholders for the inclusion of adolescents in Care Groups. Also, adolescent girls felt confident and comfortable to speak freely due to their familiarity with Lead Mothers;
- b) Community mobilisation and house-to-house visits by Lead Mothers provided awareness among community members regarding the specific objectives and expected health and nutritional benefits of including adolescent girls; and
- c) Direct intervention by Lead Mothers and Community Leaders with husbands who refused to provide permission to include their adolescent wives.

Once the programme was accepted by community members – and most importantly husbands – many of these same individuals, who were initial barriers, became facilitators of adolescent mother's engagement.

- III. Develop new approaches for adolescent girls:
 - a) Girls can also be reached through other social platforms and gatherings, such as: Arabic (religious) school and ceremonial gatherings;
 - b) Utilise adolescent Care Group members to recruit their peers; and
 - c) While it is culturally difficult to include unmarried adolescent girls in Care Group sessions, they were still reached through house visits by Lead Mothers. Specific messages targeting these unmarried girls should be developed focusing on pre-conception education and counselling on nutrition and health.

Strengthening quality of Care Group programme

- I. Cater session structure and topics to adolescent girls:
 - a) Provide an extra session each week or extra time following weekly sessions for adolescent girls with the aim of reinforcing the knowledge shared during each topic and problem-solving to support practice. The use of more educated Lead Mothers may be necessary to provide more detailed technical information;
 - b) Train Traditional Birth Attendants (TBAs) as Lead Mothers to provide more detailed technical information and provide higher coverage in remote areas not yet reached;
 - c) Provide additional detailed information to adolescent girls on malnutrition, family planning, exclusive breastfeeding and complementary feeding. The current information provided was limited and needed to be more in-depth;
 - d) Provide additional session topics on 1) sexual and reproductive health, including basic sex education tailored for adolescent girls, 2) importance and benefits of immunisations; and 3) Early Childhood Development (ECD), and 4) malaria prevention and treatment.

- II. Adapting groups/sessions and house visits:
 - a) Form adolescent-only Care Groups to address participation anxiety in the presence of older Care Group members;
 - b) For mixed age groups, provide opportunities after sessions for Lead Mothers to speak privately with adolescent girls. Additionally, ensure separation of adolescent girls from their mothers-in-law or other relatives by placing them in different groups;
 - c) Conduct Care Group sessions and house visits specifically targeting husbands that cover the importance and benefits of a healthy, diverse diet and seeking health services without delay; and
 - d) House visits targeting unmarried adolescent girls to provide them with knowledge relating to pre-conception health and nutrition topics.

Recommendations regarding programme M&E and capacity-building are shown in Box 1.

Conclusions

The Care Group approach provides an opportunity to target adolescents appropriately to achieve improved maternal and child health and nutrition. The lessons learned and recommendations from this case study can be used to advocate for greater adolescent inclusion in programmes, as well as giving insight on how to adapt programmes to fit the unique needs of this target population.

For more information, contact: Shiromi Michelle Perera, International Medical Corps, 1313 L Street NW, Suite 220, Washington DC 20005, USA. tel: +202 828 5155
Email: sperera@internationalmedicalcorps.org

The full report *Case Study on Adolescent Inclusion in the Care Group Approach – the Nigeria Experience* can be accessed through the FSN Network Resource Library at www.fsnnetwork.org/case-study-adolescent-inclusion-care-group-approach-nigeria-experience

References

- Black RE et al. 2013. *Maternal and child undernutrition and overweight in low-income and middle-income countries*. *Lancet* 382:427-51. Published online 6 June 2013. [http://dx.doi.org/10.1016/S0140-6736\(13\)60937-X](http://dx.doi.org/10.1016/S0140-6736(13)60937-X)
- Bhutta ZA, Das JK, Rizvi A, Gaffey MF, Walker N, Horton S, Webb P, Lartey A, Black RE; 2013. *Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost?* *Lancet Nutrition Interventions Review Group Lancet* 382:452-77. www.ncbi.nlm.nih.gov/pubmed/23746776
- NDHS 2014. *Nigeria Demographic and Health Survey 2013* <http://dhsprogram.com/pubs/pdf/FR293/FR293.pdf>
- UN and IFPRI 2000. UN Administrative Committee on Coordination Sub-Committee on Nutrition (ACC/SCN) & International Food Policy Research Institute (IFPRI). *4th Report on the World Nutrition Situation: Nutrition Throughout the Life Cycle*. 2000. www.unsystem.org/scn/archives/rwn04/index.htm
- WHO 2005. *Nutrition in adolescence: Issues and Challenges for the Health Sector: Issues in Adolescent Health and Development*. (WHO discussion papers on adolescence). World Health Organization 2005. www.who.int/iris/handle/10665/43342#sthash.JOMDHciH.dpuf

Box 1 Programme M&E and capacity-building

- a) Disaggregate data by age in order to capture information and inform programmers on number and distribution of adolescent girls in the various Care Groups. This will also enable investigation of health and nutrition outcomes of infants born to adolescent mothers (this data is currently not disaggregated);
- b) Due to high levels of illiteracy among Lead Mothers, it is recommended that either pictorial representations are developed (young girl mother versus older mother) or Care Group promoters and supervisors can help with collecting this data;
- c) Provide specific adolescent-sensitive and training and monitoring for Care Groups;
- d) Provide pre and post-KAP surveys for Care Group monitoring and improvement;
- e) Conduct a barrier analysis survey with Lead Mothers to understand cultural determinants on inclusion of adolescent girls; and
- f) Strengthen linkages with the health facilities to ensure all participants receive folic acid, vitamin A, deworming if/when necessary and to assess birth weight and other nutrition/health indicators from Care Group participants.

Assessment of adolescent girl nutrition, dietary practices and roles in Zimbabwe

By Amelia Reese-Masterson and Pamela Murakwani



Amelia Reese-Masterson has been with International Medical Corps since November 2011 as Research Advisor in the Nutrition, Food Security and Livelihoods Unit. She has over six years' experience

working in applied maternal and child health and nutrition research and programming. She holds an M.P.H. from Yale School of Public Health, with a focus in nutritional epidemiology.



Pamela Murakwani is the Country Director for International Medical Corps in Zimbabwe and Lead Nutrition Specialist for the USAID-funded Amalima Development Food Assistance Programme in

Zimbabwe. She has over five years' experience working in integrated nutrition programmes. She holds a Master's degree in Public Health Nutrition from the London School of Hygiene and Tropical Medicine, United Kingdom and a BSc in Nutrition from the University of Zimbabwe.

This assessment was made possible through internal International Medical Corps funding and was further facilitated through the Amalima programme in Zimbabwe and technical support from staff at headquarters and in Zimbabwe. We acknowledge the study coordinator, Zothile Mlobane, and the team of survey data collectors and enumerators. We also acknowledge the Ministry of Health and Child Care (MoHCC), Zimbabwe and the Local Government and Rural District Council offices for approving this assessment and recognising the importance of increased knowledge of adolescent girl nutrition and health in Zimbabwe. Finally, we acknowledge the technical support received from Terri Ballard and Mark Nord at the Food and Agriculture Organization (FAO), Bradley Woodruff (Columbia University) and Kristen Cashin (FANTA).

IMC, Zimbabwe, 2015

Location: *Zimbabwe*

What we know: Adolescence is a period of heightened nutritional need, which can be compounded by pregnancy. There is a gap in knowledge to help guide programming priorities for adolescent nutrition, including in programme areas where International Medical Corps operates in Zimbabwe. Research has shown that menarche (or puberty) may be an opportunity for catch-up growth

What this article adds: A recent study (cross-sectional survey and focus group discussions) examined adolescent girl nutrition, dietary practices and roles in four districts of Zimbabwe. Pregnancy was common (27%) and mostly outside marriage (89%) amongst 692 adolescent girls surveyed (13-19 years of age). Average age at first marriage was 16.6 years. Only 36% of the sample was attending school. The overall women's dietary diversity score was 3.2. Nearly half (47%) of those surveyed were food-insecure and 66% had poor dietary diversity, which significantly correlated. However, rates of stunting and thinness were under 10%. Correlation between menarche and stunting (17.7% pre-menarche, 2.3% post-menarche) was significant ($p < .001$), although the sample size was small. Key influencers were aunts (pregnancy and contraception), mothers (food preparation and purchase, health-seeking) and parents (schooling). Nutrition and hygiene knowledge was low. Recommendations include integrated behaviour change at key contact points, interventions to retain girls in schooling, and adolescent-sensitive food security programming to address dietary diversity. Much further research is needed, including how to engage men and adolescent boys in avoiding early pregnancy, mid-upper arm circumference (MUAC) cut-offs, and adolescent reference populations for nutritional status assessment.

Adolescence is a period of heightened nutritional need, which can be compounded by pregnancy with its additional demands on a mother's nutrient stores. The Lancet 2013 series on maternal and child nutrition identifies adolescent girls as a priority focus area for research and programming, due to the dearth of evidence available to inform adolescent nutrition interventions and the importance of ensuring nutritional wellbeing in this age group through puberty and going into motherhood. In recognition of this global need, and in response to the Zimbabwe Ministry of Health and Child Care (MOHCC)'s noted gap in knowledge to help guide programming priorities for adolescent nutrition, International Medical Corps carried out a study in June 2015 to examine adolescent girl nutrition, dietary practices and roles in Zimbabwe. The objectives of this assessment were to: 1) Describe nutrition-related beliefs, knowledge and practices among adolescent girls; 2) Assess adolescent girl nutrition, food security and dietary diversity status; 3) Identify potential risk factors related to poor adolescent nutritional status; and 4) Identify and characterise 'key influencers' who contribute to determining adolescent girl roles and responsibilities around nutrition.

Programme background

International Medical Corps is the technical lead for nutrition and health components of the USAID-funded Amalima programme (2013-2018), a five-year Development Food Assistance programme being implemented

by Cultivating New Frontiers in Agriculture (CNFA), International Medical Corps, The Manoff Group, Organisation of Rural Associations for Progress (ORAP), Africare and Dabane Trust in two provinces in Zimbabwe; Matabeleland North and Matabeleland South. The programme is being implemented across four districts (Tsholotsho in Matabeleland North and Bulilima, Mangwe and Gwanda in Matabeleland South), with a goal to improve household food and nutrition security. Strategic objectives include: 1) Improved household access to and availability of food; 2) Improved community resilience to shocks; and 3) Improved nutrition and health among pregnant and lactating women and boys and girls under two years of age.

While there are currently no Amalima activities specifically designed to address the nutritional needs of adolescent girls (beyond the wider programme activities, in which adolescent girls may participate), International Medical Corps staff have noted significant numbers of pregnant teenage girls and young mothers, with programme staff noting anecdotally girls as young as 14 years. This indicates early sexual debut, possibility of school drop-out and increased risk of maternal morbidity and mortality. International Medical Corps recognises the need for tailored services for adolescent girls through a life-cycle approach that would ensure good nutritional practices and status throughout the adolescent period and better prepare them going into the critical '1,000 day window of opportunity' from conception to second birthday.

Study methods

The assessment utilised both quantitative and qualitative data-collection methods. A cross-sectional survey was carried out among adolescent girls aged 13-19 years (n=692), using multi-stage cluster sampling, representative of selected wards in Mangwe and Tsholotsho districts. The questionnaire included demographics, dietary beliefs and practices, sexual and reproductive health, health access, food security, dietary diversity, WASH (water, sanitation and hygiene), community involvement and anthropometric measurements. Data were analysed in SPSS (Statistical Package for the Social Sciences) looking at descriptive statistics, correlations and difference in means. Further analysis of the Food Insecurity Experience Scale (FIES) data was conducted by the Food and Agriculture Organization (FAO) to look at the quality and comparability of the measure (Reese-Masterson et al, 2015). Qualitative data were collected by trained facilitators through focus group discussions (FGDs) and key informant interviews (KIIs) with adolescent boys (two FGDs, two KIIs), mothers/mothers-in-law (three FGDs) and fathers (two FGDs) of adolescent girls, as well as with adolescent girls (one FGD, one KII). There was an average of 10 participants across all groups. Qualitative data were analysed for themes and subthemes through an iterative process.

Findings

For the survey assessment, 692 adolescent girls aged 13-19 years (average age 15.94, SD 1.9)

were interviewed in Tsholotsho and Mangwe districts, with a response rate of 98.5% (10 total refusals). The survey and qualitative results revealed that girls tend to drop out of school at Form 4 (secondary school). Only 36% of the sample was attending school at the time, and many adolescent girls did not complete school due to lack of money for school fees, pregnancy, long distances to travel, household demands and migration for work (particularly among older adolescent girls). School attendance is primarily decided by parents, with some adolescent girls reporting that they make this decision themselves.

While most of the sample had never been married (97%), pregnancy was common (27%), with 89% of pregnancies being outside marriage. The average age at first marriage was 16.6 years (SD 1.2) (Table 1). Among those who had ever been married or ever been pregnant, 120 (61%) reported using a condom at last their sexual encounter. Many adolescent girls reported that their aunts were a major source of information on pregnancy and contraceptive use. Health facilities were the primary source of contraception obtained by adolescents, followed by shops/stores (where many adolescents were said to spend their free time). During FGDs with mothers, some reported that they helped ensure their daughters had access to family planning.

Of surveyed adolescent girls, 47% were food-insecure and 66% had poor dietary diversity, yet rates of stunting and thinness were under 10% (Table 2). Previous research has shown that menarche (or puberty) may be an opportunity for catch-up growth. Thus, we explored whether stunting was higher in those pre-menarche or post-menarche and found that of those adolescents who were pre-menarche, 17.7% were stunted (HAZ <-2 SD), while among those who were post-menarche, only 2.3% were stunted. The correlation between menarche and stunting was significant (p<.001), but should be interpreted with caution due to the smaller sample size.

Comparing mean dietary diversity score across levels of food insecurity (Figure 3), we find that greater food insecurity is statistically significantly correlated with lower dietary diversity (Pearson X² 28.14, p<.001). This indicates food insecurity may be contributing to poor dietary diversity among adolescent girls.

A variety of socio-behavioural factors were identified that may contribute to adolescent girl nutrition status (Table 3). Adolescent girls were commonly engaged in food preparation (92%), but had little food-related decision-making power. Mothers were the primary decision-makers surrounding both food purchases and preparation. Adolescent girls had low levels of knowledge on nutrition, particularly nutrition during pregnancy. Adolescent girls' primary source of health/nutrition information was school (34%), followed by clinics (25%) and community health workers/volunteers (15%). Another 15% reported that they did not receive or did not know where they received health/nutrition information.

Only 14% of adolescent girl respondents could correctly identify the five critical hand-washing moments; a risk factor for diarrhoea, infection and poor nutritional status. Most households where adolescents were residing get their water from a borehole and about 87% of adolescent girls are involved in fetching and carrying water regularly, with distances typically less than 30 minutes away, but sometimes reaching one to three hours of walking. Most girls reported being able to bathe more often during menstruation and most had the products they needed to manage menstruation, although some were using found items such as old rags or leaves rather than sanitary products from a store.

Reported health-seeking was high, with 97% of adolescent girls saying they seek assistance when they are sick or have a health-related concern. Similarly, the majority (97.3%) said they feel comfortable seeking health services as an adolescent and that the services meet their

	Mangwe & Tsholotsho
	N=692
	N (%)
Attending school	250 (36.2)²
<i>Education level attained</i>	
≤ Primary school (grade 1-7)	243 (35.2)
Some secondary (form 1-4)	341 (49.4)
Completed secondary (form 4)	99 (14.3)
Some high school (form 5-6)	3 (0.4)
≥ High school (form 6+)	4 (0.6)
Employed	56 (8.1)
<i>Occupation²</i>	
Domestic worker (not in own home)	21 (51.2)
Agriculture, gardening	6 (14.6)
Vendor, shopkeeper	6 (14.6)
Babysitter	3 (7.3)
Cook for pre-school	2 (4.9)
Hairdresser	2 (4.9)
Other	1 (2.4)
Marital status	
Never married	660 (96.8)
Married	21 (3.1)
Widowed	1 (0.1)
	Mean (SD)
Average age (years)	15.94 (1.9)
Age at first marriage ³	16.60 (1.2)
Perceived common marriage age	19 (2.6)
Perceived 'good age to get married'	23 (3.8)
Household size	5.92 (2.4)

¹ Numbers may not sum to total due to missing data. Valid percentages are used throughout.

² Among those who were employed (n=56)

³ Among those ever-married (n=22)

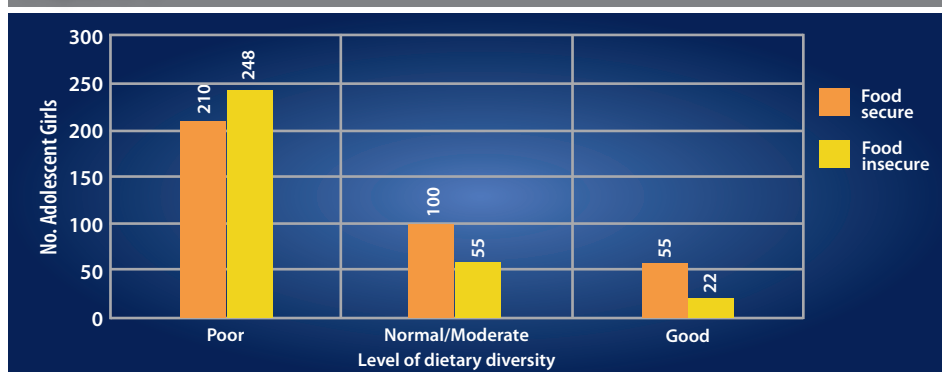
	All n=692	Mangwe n=406	Tsholotsho n=286
	N(%) or Mean(SD)	N(%) or Mean(SD)	N(%) or Mean(SD)
Food Security¹			
Food secure	233 (33.9)	101 (25.1)	132 (46.2)
Marginal food security	131 (19.0)	81 (20.1)	50 (17.5)
Moderate food insecurity	216 (31.4)	146 (36.3)	70 (24.5)
Severe food insecurity	108 (15.7)	74 (18.4)	34 (11.9)
Women's Dietary Diversity Score (Average)²	3.17 (1.09)	3.23 (1.14)	3.08 (1.02)
Women's Dietary Diversity			
Good (≥5 food groups)	77 (11.2)	56 (13.9)	21 (7.3)
Poor (≤3 food groups)	458 (66.4)	257 (63.6)	201 (70.3)
Stunting (HAZ <-2 SD)³	40 (6.7)	19 (5.4)	21 (8.5)
Severe stunting (HAZ <-3 SD)³	6 (1.0)	1 (0.3)	5 (2.0)
Thinness (BMI/age Z <-2) ³	36 (6.0)	26 (7.4)	10 (4.0)
Severe thinness (BMI/age Z <-3)³	5 (0.8)	4 (1.1)	1 (0.4)

All percentages are column percentages.

¹ From the FAO Food Insecurity Experience Scale (FIES) tested for use in Ndebele language in Zimbabwe

² Based on the nine-item FAO Women's Dietary Diversity Score (WDDS). A diet is more likely to meet micronutrient needs at ≥5 food groups. Poor dietary diversity is defined as ≤3 food groups consumed.

³ Only among non-pregnant adolescents aged 13-19 years, as there are established cut-offs for this group (n=599).

Figure 1 Food security status by level of dietary diversity**Table 3** Nutrition knowledge, beliefs, and practices

	N(%) or Mean(SD)
Primary source of health/nutrition information	
School	237 (34.3)
Clinic	173 (25.1)
Community health workers/volunteers Care Group	102 (14.8)
Other	39 (5.7)
Did not receive/Don't know	36 (5.2)
103 (14.9)	
Knowledge of food groups	91 (13.2)
None	257 (37.1)
Poor	195 (28.2)
Fair	149 (21.5)
Good	
Knowledge of diet during pregnancy (correct response)	520 (75.1)
Knowledge of "4-star diet"¹ during pregnancy	239 (34.7)
Poor (0-1)	378 (54.6)
Medium (2-3)	72 (10.4)
Good (4)	
Who is prioritised at mealtime (top 4)	371 (53.6)
All eat at same time	100 (14.5)
Grandparents	94 (13.6)
Children	37 (5.4)
Mother	
Adolescent girl is primary meal preparer in household	327 (47.3)
Adolescent girl often/always prepares household meals	632 (91.7)

¹ The "4-star diet" is promoted in Zimbabwe among pregnant women. It consists of: grains and staples, legumes, vegetables and fruit, and animal-source foods.

needs. Among those who said they were uncomfortable (2.4%) or felt the health services did not meet their needs (2.7%), the following reasons were given: nurse attitude (nurses were said to be 'mean', aloof, rude, or accused the girls of 'loose morals'), slow service/long lines, hesitancy to go accompanied by parents and lack of medications or corruption in distribution. While 43% of adolescent girls said they choose to seek healthcare for themselves, others pointed to their mother or grandmother as the primary decision-maker on their own health-seeking.

Discussion

This assessment identified a variety of socio-behavioural and other factors that may contribute to adolescent girl nutritional status and practices in Zimbabwe. Many experience food insecurity and related poor dietary diversity, indicating

their diets are unlikely to meet micronutrient adequacy (although stunting and underweight were found to be under 10%). The overall women's dietary diversity score for adolescent girls in our sample was 3.2, which is similar to the dietary diversity score (3.1) found in a recent Title II Food for Peace baseline survey among the population in Amalima and ENSURE programme areas (USAID, 2015).

Pregnancy among unmarried adolescent girls is common, with low contraception use, indicating more work is needed to increase both knowledge and use of contraception for delaying pregnancy and practicing safe birth-spacing. Due to heightened nutritional needs in this age group, pregnancy poses additional risks for adolescent girls and their babies. In addition, although about 60% of married/sexually active adolescent girls reported condom use at last sexual encounter, continued promotion of condom use for protection against sexually transmitted infections is important, particularly given that the HIV prevalence rate in Zimbabwe is 15.2% (Zimbabwe Demographic Health Survey, 2010-11).

A variety of 'key influencers' or 'gatekeepers' were identified. As mentioned, the aunt was identified as a major source of information for adolescent girls on pregnancy and contraceptive use, and may have influence over nutrition or food-related decisions, depending on household structure. The mother was identified as the primary decision-maker surrounding both food purchases and food preparation. Adolescent girls commonly decide for themselves about seeking health services, and many identified their mothers or grandmothers as key influencers in health-seeking decisions. Decision-making on school attendance is made primarily by parents, with some adolescent girls reporting they make this decision themselves, which indicates a need to involve parents in any programmes intending to incentivise adolescent girl school attendance.

Recommendations

A key recommendation is to provide integrated behaviour change activities on sexual and reproductive health, WASH and nutrition through platforms where adolescent girls spend time: school clubs, sports, care groups, religious gatherings and water collection points.

Interventions to keep older adolescent girls

in school while promoting improved diets and delayed pregnancy/marriage are critical, potentially including peer-to-peer models, incentives (e.g. income-generating activities contingent on school attendance, take-home food rations, etc.), community conversations among 'key influencers', and mobile phone messaging.

Men and boys should be engaged in efforts to reduce and delay adolescent pregnancies. Based on qualitative findings, several groups of men and boys stood out as key groups to target in reducing adolescent pregnancy. These include: cattle herders, local non-school-going adolescent boys and men returning home during the holidays from cross-border work. Although we did not interview husbands of adolescent girls, this group should be considered as well. Working with these populations to ensure they have both contraception knowledge and access to contraceptives may help prevent adolescent pregnancy.

Finally, programmes and policies addressing food insecurity alongside ongoing nutritional surveillance among adolescent girls are critical, due to the very high rates of food insecurity. This could include working with the private sector (such as input dealers, seed dealers, etc.) to improve access to nutrient-rich local foods and/or providing cash vouchers to give users flexibility to access needed commodities, depending on markets.

This assessment highlights the gap in knowledge on adolescent girl nutrition in Zimbabwe and provides some insight on what programming priorities should focus upon. However, further research is needed, including: assessment in other provinces or at the national level; further assessment to confirm adolescent use of health service across Zimbabwe; research on the nutritional value of indigenous/traditional foods and adolescent preferences; measurement of anaemia status; follow-up research on men's perspectives and roles/behaviours to determine best approaches to engage adolescent boys and men to prevent unplanned/early pregnancy; and general research to establish age-appropriate cut-offs for measurement of adolescent girl nutritional status. Additionally, global gaps in knowledge on adolescent nutrition remain. Particularly of relevance to this assessment was lack of evidence to inform guidance on mid-upper arm circumference (MUAC) cut-offs for pregnant adolescent girls, as well as the need for more appropriate adolescent reference populations by region or country to enable more accurate calculation of adolescent nutritional status.

For more information, contact: Amelia Reese-Masterson, email: areese@internationalmedicalcorps.org

References

- Reese-Masterson A, Murakwani P & Mlobane Z, 2015. *Assessment of Adolescent Girl Nutrition, Dietary Practices, and Role in Zimbabwe: Mangwe and Tsholotsho Districts*. June 2015. International Medical Corps.
- USAID 2015. *Baseline Study of Title II Development Food Assistance Programs in Zimbabwe, 2015*. Zimbabwe Demographic Health Survey, 2010-11.

By Abu Ahmed Shamim, Kathrin Tegenfeldt, Kerry Aradhya, Tarana Ferdous, Nasrin Banu, Sumitra Roy, Raisul Haque, Saydur Rahman Siddiquee, Mosiqure Rahman and Nazma Shaheen



Abu Ahmed Shamim has managed nutrition intervention and research projects for the Bangladesh National Nutrition Council, CARE and Johns Hopkins University before joining FHI 360 as technical director of the SHIKHA project. He has steered the development and field-testing process of the food plate for Bangladeshi pregnant women and led the writing and editing of this article.



Kathrin Tegenfeldt is the former country director for the FHI 360 Bangladesh office. She served on the executive committee of the Civil Society Alliance for Scaling Up Nutrition in Bangladesh.



Kerry Aradhya is a science writer and editor at FHI 360 with extensive experience in the areas of global health, population and nutrition in developing countries.



Tarana Ferdous is a research officer at the Center for Injury Prevention and Research, Bangladesh. She was involved with the SHIKHA project as a consultant and USAID-supported fellowship at the James Pitter Grant School of Public Health, BRAC University.



Nasrin Banu is involved with the SHIKHA project through a USAID-supported fellowship at the James Pitter Grant School of Public Health, BRAC University and currently works as a consultant with FHI360.



Sumitro Roy has more than two decades of experience managing rural development, health and nutrition projects. He was the chief of party for the SHIKHA project and is currently the project director with the Alive & Thrive Initiative of Family Health International Solutions in Uttar Pradesh, India.



Raisul Haque heads the health, nutrition, and population programme at BRAC and has three decades of experience in public health service delivery and programme management.



Saydur Rahman Siddiquee managed public health and nutrition projects for the World Health Organization and Alive & Thrive before joining FHI 360 as a field programme manager for the SHIKHA project.



Mosiqure Rahman worked for ten years at PLAN International before joining FHI 360 as a monitoring and evaluation specialist for the SHIKHA project.



Nazma Shaheen is professor and director of the Institute of Nutrition and Food Science at Dhaka University. She has nearly three decades of teaching and research experience in nutrition and food science and was the lead scientist in the recent update of the Food Composition Table for Bangladesh.



Participants of focus group discussion examine the second version of the food plate

Designing a food plate for dietary counselling of pregnant women in Bangladesh

Abu Ahmed Shamim, SHIKHA Project, FH360

Acknowledgements: The SHIKHA project (2013-2016) is implemented by FHI 360 in partnership with BRAC (Bangladesh's largest non-governmental organisation). This analysis was made possible with generous support of the American people through the United States Agency for International Development (USAID) under Cooperative Agreement # AID- 388-A-13-00003. The contents are the responsibility of the authors and do not necessarily reflect the views of USAID or the United States Government. The authors acknowledge the contribution of the pregnant women and field workers of BRAC who contributed their time and the SHIKHA project implementation teams of BRAC health division and FHI 360 and experts from many organisations who shared their insights at different stages of developing the plate. The authors also acknowledge the contributions of Dr. Lalita Bhattacharjee, senior nutritionist, FAO; Dr. Mohammad Abdul Mannan, nutrition policy advisor, FAO and Dr. Quamrun Nahar, senior research officer, BIRDEM, for providing technical insights in developing the food plate.

Location: Bangladesh

What we know: Undernutrition is common among women in Bangladesh. For pregnant women, dietary diversity has been associated with nutrition sufficiency and good pregnancy outcomes.

What this article adds: One of the objectives of the SHIKHA project in Bangladesh is to promote dietary diversity among pregnant women through nutrition education and counselling. With this objective in mind, SHIKHA developed a food plate that is being used in Bangladesh as a counselling tool to promote a healthy, balanced diet during pregnancy. Experiences of developing the plate have shown that systematically consulting with pregnant women and frontline nutrition workers, as well as involving experts from relevant organisations in the process, helps ensure quality and acceptance of the plate and the messages it promotes. The experience in Bangladesh could serve as a model for the development of similar educational tools in other developing countries.

Background

Compared with other developing countries, Bangladesh has a high prevalence of undernutrition among women (Osmani & Sen, 2003). According to the 2011 Bangladesh Demographic and Health Survey (BDHS, 2011), 24% of married women aged between 15 to 49 years are undernourished (body mass index <18.5). In addition, deficiencies in iodine (Shamim, Christian, Schulze et al, 2012) vitamin B12, zinc (Shamim, Kabir, Merrill et al, 2014) and vitamin E (Shamim, Schulze, Merrill et al, 2015) have been reported among rural pregnant women. Lack of dietary diversity is common among poor and rural populations, particularly in de-



Community health workers counselling pregnant women, showing food plate in the presence of her mother-in-law

veloping countries where starchy staples are prominent and few, if any, animal products, fruits and vegetables are included in the daily diet.

Several studies have shown that nutrition education and counselling during pregnancy improves maternal diet, gestational weight gain and birth outcomes (Fowles, 2004; Piirainen, Isolauri, Lagström et al, 2006). According to a systematic review of the topic, nutritional education and counselling can significantly improve gestational weight gain by 0.45 kg, reduce the risk of anaemia in late pregnancy by 30%, increase birth weight by 105g, and decrease the risk of preterm delivery by 19% (Girard & Olude, 2012). Moreover, research has shown that an effective nutrition education programme not only improves health outcomes among pregnant women but can also help reduce medical expenses (Hermann, Williams, Hunt et al, 2001).

What is a food plate?

Some countries use a 'food plate' as an educational tool to help citizens follow national dietary guidelines. An example from the United States, called MyPlate, is a colourful image of a plate of food divided into basic food groups, designed as part of a campaign against obesity and to remind consumers about the basics of a healthy diet. MyPlate is based on the dietary guidelines for Americans (Office of Disease Prevention and Health Promotion, 2015), a set of evidence-based nutrition practices developed by the De-

partment of Health and Human Services (HHS) and the Department of Agriculture (USDA). MyPlate was created by the USDA and released in June 2011 to replace MyPyramid, which was not so user-friendly (USDA 2011 [1]); (USDA 2011 [2]).

In developed countries, the food plate concept has been adapted for specific populations such as pregnant women. The SHIKHA project (see Box 1) wanted to design and test a customised plate for pregnant women specific to the Bangladeshi context. Given that obesity and excess weight gain during pregnancy is a serious problem in developed countries, the emphasis of the plates in these contexts has been on reducing the intake of energy-dense foods and promoting fibre and micronutrients. In Bangladesh, where undernutrition is common and families often have very little money to spend on food, the emphasis needs to be on promoting both quantity and quality (diversity) of foods.

The SHIKHA project and its initiative to develop a food plate

The SHIKHA project promotes diet quality among pregnant women and children under the age of two in 26 rural sub-districts in Bangladesh, with nutrition education and counselling one of its core components. Community volunteers are involved in identifying pregnant women, and frontline nutrition workers record

all the pregnancies in a register. Through five follow-up home visits, the nutrition workers provide hands-on counselling and demonstrations to the pregnant women and their families about healthy and balanced diets during pregnancy. No standardised tools for dietary counselling of pregnant women were previously available in Bangladesh. This article describes the steps used to design the original food plate and develop an improved, final version of the plate based on field experience.

Designing the original plate

Literature review

SHIKHA reviewed desired dietary patterns developed by the Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and

Table 1 Photographs of the original plate and its limitations



Few limitations

- Photo quality was poor
- Cultural acceptability (for example, guava is generally not eaten with rice)
- Affordability of suggested foods (both egg and fish in same meal is not affordable for most women)
- No clear messages and about desired behaviours

Box 1 The SHIKHA Project

The U.S. Agency for International Development (USAID) SHIKHA project works to reduce undernutrition among pregnant women and children under the age of two years old. The project scales up maternal nutrition and infant and young child feeding (IYCF) interventions in 26 sub-districts in Bangladesh. The project is implemented by FHI 360 and funded by USAID under the Feed the Future initiative. BRAC, another project partner, implements community-level activities.

SHIKHA engages 5,313 community volunteers, 373 community health workers and 653 nutrition workers through BRAC and trains them in maternal nutrition and IYCF. The project focuses on changing the feeding-practice behaviours through five core interventions: home visits (five during pregnancy and 12 post-natal); mobilisation engaging fathers and doctors; health forums (community meetings) targeting pregnant women, mothers of children under years old, mothers-in-law and adolescent girls; antenatal and postnatal visits; and mass media and communication campaigns (involving media experts and including TV ads).

In addition to regular monitoring and evaluation, the project is partnering with the Centre for Injury Prevention and Research (www.ciprb.org), Bangladesh to conduct household surveys at three intervals, in 2013, 2015 and 2016. The surveys will be used to assess progress on knowledge and practice-level indicators for maternal nutrition and IYCF among pregnant women and mothers of children under two years old.

For more information, visit: www.fhi360.org/projects/shikha

Table 2 Organisations/projects consulted during the development of the food plate

1	Alive & Thrive
2	Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Diseases
3	Bangladesh University of Health Sciences
4	BRAC and BRAC University
5	Food and Agriculture Organization of the United Nations
6	Helen Keller International
7	Institute of Nutrition and Food Science, Dhaka University
8	International Potato Centre
9	Ministry of Food
10	SPRING
11	UNICEF
12	U.S. Agency for International Development
13	WASHplus
14	WorldFish
15	World Food Programme

Metabolic Disorders (BIRDEM) with support from the Ministry of Food and the Food and Agriculture Organization of the United Nations (FAO) (Nahar, Faruque, Sultana et al 2013). Baseline survey findings from the SHIKHA project and research on nutrition and dietary practices of pregnant women in Bangladesh were also reviewed to conceptualise the food plate. A decision was made to use the plate primarily to promote dietary diversity. Dietary diversity is known to be associated with micronutrient adequacy among women of reproductive age (Arimond, Wiesmann, Becquey et al, 2010), but such diversity was lacking in SHIKHA intervention areas (Shamim, Mashreky, Ferdous et al, 2016).

First version of the plate and approval by expert consultation

The original food plate had a border illustrating food groups that pregnant women should eat every day during pregnancy. The middle of the plate contained a photo of a typical lunch or dinner meal. A main message about eating a variety of foods in sufficient amounts during pregnancy was written in Bangla across the bottom of the plate. The original design (Table 1) was presented and approved during an expert consultation held in Dhaka on September 4, 2014. (A list of organisations that participated in the meeting or were otherwise consulted during the development of the plate is shown in Table 2). After the meeting,

sample melamine plates were produced for field use and testing.

Finalising the plate

Field experience of using the plate

The melamine plates were distributed to SHIKHA's nutrition workers and incorporated into counselling sessions to promote dietary diversity in the intervention areas. Feedback was gathered through focus group discussions and in-depth interviews with ten nutrition workers, 11 pregnant women, and four experts in the management and design of nutrition projects (Table 3A).

Pregnant women and frontline workers classified foods according to their permissibility (accessibility) and aspiration (desirability). Certain foods that are usually promoted in nutrition programmes, such as carrots, were identified as neither desirable nor accessible in the rural areas (Table 4). Feedback and suggestions were also provided on picture quality and messages (Table 5). The following is a summary of the field suggestions:

1. Sample meal: The quantity of foods to be eaten in a main meal should be shown within a circle in the centre of the plate.
2. Food groups: Do not show too many food groups (but sub-groups can be shown in different shades of colour within the same group).
3. Messages: Printing a few more messages than the original plate may help pregnant women follow improved practices.

Table 3 Data collection methods and participants who provided data

Method of data collection	Target audience	Number of participants	Total number of participants
3A: Data collection during first round of field-testing			
Focus group discussion	Pregnant women	11	16
	Frontline nutrition workers	5	
In-depth interview	Nutrition workers and supervisors of BRAC	5	5
Key informant	Senior staff engaged in designing and managing nutrition projects	4	4
3B: Data collection during second round of field-testing			
Focus group discussion	Rural women	16	28
	Frontline nutrition workers	12	
In-depth interview	Nutrition workers and supervisors of BRAC	2	2
Total			55

Table 4 Segregation of foods according to permissibility (accessibility) and aspiration (desirability) by pregnant women and frontline nutrition workers

		High permission	
Low aspiration		<ul style="list-style-type: none"> • Leafy vegetables • Pulses • Rice • Carrot 	High aspiration
		<ul style="list-style-type: none"> • Small fish • Some seasonally available local fruits • Few local vegetables (gourds) • Large fish • Flesh foods • Fruits like grapes, apples • Milk 	
		Low permission	

Table 5 Comments of pregnant women and nutrition workers on quality of images and messages

Features	Problems/suggestions	Photo of the panel
Complexity to understand pictures of different foods	<p>Confused mango with papaya and hog palm with guava and olive</p> <p>Confused bean with okra/ peas</p> <p>Chickpeas were poorly understood</p>	
Perception of illustration including background colour	<p>Flesh foods and eggs should be in the same panel but in two different shades of background colour</p> <p>Glass of milk will look transparent</p>	
Font size	No problem	

Table 6 Two food plate options presented at the second expert consultation

Photo of food plate	Main features
Option 1	
	<ul style="list-style-type: none"> • Three food groups: <ol style="list-style-type: none"> 1. Protein (legumes and nuts, flesh and eggs in three shades of green) <p>Message: Various protein-rich foods every day (alternative message: daily various protein for proper growth of foetus, but bigger baby is not desirable to avoid delivery complications)</p> 2. Energy-giving foods (cereals, tubers and oil in two shades of sky blue) <p>Message: A little more energy-giving foods</p> 3. Foods to remain healthy coloured and green leafy vegetables, vegetables and fruits in four shades of purple <p>Message: To remain healthy every day, vitamin-rich coloured and green leafy vegetables, vegetables, fruits and milk</p> • A prominent message about quantity of foods and another message about hand-washing
Option 2	
	<ul style="list-style-type: none"> • Four food groups (milk as a separate group) • No message about food groups, but a message about the quantity of foods that need to be eaten every day • Other features similar to the previous design

Table 7 Final version of the food plate**Photo of food plate****Messages**

Prominent message: Half plate of rice and at least four other varieties of food

Eating a variety of food in appropriate amounts keeps mothers and children healthy

Eat a little more food during pregnancy

Wash both hands with soap and running water before preparing and eating food



Key informant interview with Monira Parveen, PhD, Senior Program Officer, Nutrition, World Food program, Bangladesh

Second expert consultation

The design was revised based on the feedback from the field. Two new food plate options were presented at a second expert consultation held in Dhaka on June 10, 2015. The two options are described in Table 6. The experts preferred a combination of both options, but suggested adding more messages and fine-tuning them through additional field-testing. The following is a summary of their recommendations:

1. Include four to five food groups on the plate.
2. Include one central message about quantity of rice and food diversity.
3. Include three additional messages: one about the importance of eating a diverse diet, one about quantity of food, and one about hand-washing.
4. Incorporate these recommendations into a second version of the plate, collect the opinions of pregnant women and frontline nutrition workers, and finalise the design accordingly.

More field-testing and final design and development of a guideline for the nutrition workers

The recommendations were incorporated and images of the revised plate were printed and laminated for field-testing. Focus group discussions and in-depth interviews were held with 16 rural women and 14 nutrition workers (Table 3B) and feedback was incorporated into the final design. The final design (Table 7), which contains four messages, was transformed into more than 5,500 melamine plates that nutrition workers and pregnant women can hold in their hands during counselling sessions.

Conclusion

This practical, colourful, evidence-based food plate is an educational tool with the potential to improve maternal nutrition not only within the SHIKHA intervention areas but throughout Bangladesh and in similar countries where projects are working to promote healthy maternal

diets. Several organisations have shown interest in using the plate in their own nutrition education and counselling efforts, including the Integrated Agriculture and Health Based Intervention (IAHBI) project of FAO and UNICEF, which is procuring several thousand food plates. In its final year, SHIKHA is working with the Bangladesh Government to explore opportunities for wider use of the tool; at the time of writing, a process was underway to get approval of the plate from the National Nutrition Service and the Ministry of Health and Family Welfare for use as a counselling tool in improving diet quality of pregnant and lactating women.

For more information and guideline on the food plate, contact: Abu Ahmed Shamim, Technical Director, SHIKHA Project, FHI 360 Bangladesh, Road 35, House 5, Gulshan-2, Dhaka 1212, Bangladesh, email: ashamim@fhi360.org; and aashamim@gmail.com

References

- Arimond M, Wiesmann D, Becquey E, Carriquiry A, Daniels MC, Deitchler M & Torheim LE, 2010. *Simple food group diversity indicators predict micronutrient adequacy of women's diets in 5 diverse, resource-poor settings*. The Journal of nutrition, 140(11), 2059S-2069S.
- BDHS 2011. *Bangladesh Demographic and Health Survey 2011*. National Institute of Population Research and Training, Mitra and Associates, and ICF International. 2013. dhsprogram.com/pubs/pdf/FR265/FR265.pdf
- Fowles ER, 2004. *Prenatal nutrition and birth outcomes*. Journal of Obstetric, Gynecologic, & Neonatal Nursing, 33(6), 809-822.
- Girard AW, & Olude O, 2012. *Nutrition education and counselling provided during pregnancy: effects on maternal, neonatal and child health outcomes*. Paediatric and Perinatal Epidemiology, 26(s1), 191-204.
- Hermann J, Williams G, & Hunt D, 2001. *Effect of Nutrition Education by Paraprofessionals on Dietary Intake, Maternal Weight Gain, and Infant Birth Weight in Pregnant Native American and Caucasian Adolescents*. Journal of Extension, 39(1), n1.
- Nahar Q, Faruque O, Sultana SS, Siddiquee AA, 2013. *Dietary Guidelines for Bangladesh*. Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Diseases. www.fao.org/3/a-as880e.pdf
- Office of Disease Prevention and Health Promotion, 2015. *Dietary guidelines*. www.health.gov/dietaryguidelines. Accessed July 2015.
- Osmani S, & Sen A, 2003. *The hidden penalties of gender inequality: fetal origins of ill-health*. Economics & Human Biology, 1(1), 105-121.
- Piirainen T, Isolaari E, Lagström H, & Laitinen K, 2006. *Impact of dietary counselling on nutrient intake during pregnancy: a prospective cohort study*. British Journal of Nutrition, 96(06), 1095-1104.
- Shamim AA, Christian P, Schulze KJ, Ali H, Kabir A, Rashid M, Labrique A, Salamattullah Q, & West KP, 2012. *Iodine status in pregnancy and household salt iodine content in rural Bangladesh*. Maternal & Child Nutrition, 8(2), 162-173. www.ncbi.nlm.nih.gov/pubmed/20977661.
- Shamim AA, Kabir A, Merrill RD, Ali H, Rashid M, Schulze K, Labrique A, West KP & Christian P, 2013. *Plasma zinc, vitamin B12 and a-tocopherol are positively and plasma y-tocopherol is negatively associated with Hb concentration in early pregnancy in north-west Bangladesh*. Public Health Nutrition, 16(08), 1354-1361. www.ncbi.nlm.nih.gov/pubmed/23469947.
- Shamim AA, Mashreky SR, Ferdous T, Tegenfeldt K, Roy S, Rahman AKM, Rashid I, Haque R, et al, 2016. *Pregnant women diet quality and its socio-demographic determinants in south-western Bangladesh*. Food and Nutrition Bulletin 37 (1), 14-26.
- Shamim AA, Schulze K, Merrill RD, Kabir A, Christian P, Shaikh S, Wu L, Ali H, Labrique AB, Mehra S, Klemm RD, Rashid M, Sungpuag P, Udomkesmalee E, West KP, 2015. *First trimester plasma tocopherols are associated with risk of miscarriage in rural Bangladesh*. The American Journal of Clinical Nutrition, ajcn-094920. www.ncbi.nlm.nih.gov/pubmed/25646326.
- USDA 2011 [1]. United States Department of Agriculture. MyPlate. www.choosemyplate.gov. Accessed Feb 2015.
- USDA 2011 [2] United States Department of Agriculture. MyPlate. www.choosemyplate.gov Aug. 2011. Accessed Oct 4, 2013.

Interview with Jean Humphrey

SHINE trial

ENN interviewed Jean Humphrey, Professor at Johns Hopkins Bloomberg School of Public Health and Principal Investigator of the Sanitation, Hygiene, Infant Nutrition Efficacy (SHINE) Trial, during her brief visit to the UK in May. The trial is based on the premise that environmental enteric dysfunction (EED) is a major underlying cause of both stunting and anaemia, that chronic inflammation is the central characteristic of EED mediating these adverse effects, and that EED is primarily caused by high faecal ingestion due to living in conditions of poor water, sanitation and hygiene (WASH). The study began in 2012 and will be completed by 2017.

SHINE is a proof-of-concept, 2x2 factorial, cluster-randomised, community based trial in two rural districts in Zimbabwe. It will test the independent and combined effects of protecting babies from faecal ingestion (operationalised through a WASH intervention) and optimising nutritional adequacy of infant diet (operationalised through an infant and young child feeding (IYCF) intervention) on length and haemoglobin at 18 months of age.

In per protocol analyses, the trial will investigate the programme impact pathway of the behaviour processes linking delivery of the interventions to stunting and anaemia. For these analyses, the trial is measuring fidelity of intervention delivery and household uptake of promoted behaviours and practices, and measuring a range of household and individual characteristics, social interactions, and maternal capabilities for childcare, which are hypothesised to explain heterogeneity along the programme impact pathways. The biomedical pathway comprises the hypothesised infant biologic responses to the WASH and IYCF interventions linking improved WASH and infant diet with attained stature and haemoglobin concentration at 18 months of age. This will be elucidated by measuring bio-markers of intestinal structure and function (inflammation, regeneration, absorption, and permeability; microbial translocation; systemic inflammation); and hormonal determinants of growth and anaemia among a subgroup of infants enrolled in an EED sub-study.

As Jean was literally held up by the Queen's carriage riding down Whitehall (we were meeting at the DFID offices), our interview was necessarily brief so that we had to continue some of the questions and answers over email. Nonetheless, what we learnt was of considerable interest.

Jean began the interview by explaining that the two main causes of stunting that the public health community has primarily focused on up

until now are optimising child diet - which would prevent up to 30% of stunting - and preventing child diarrhoea, which could avert a further 7%. This means that the public health community does not have solutions for over 60% of stunting. SHINE is being conducted to inform the causes of this 60% gap. The hypothesis is that an intensive WASH intervention aimed at interrupting the faecal-oral pathway specifically for infants and young children and optimising infant diet simultaneously will make a substantial contribution toward this gap. In addition, SHINE made several additions to the trial including research on mycotoxins in staple foods (e.g. aflatoxin in peanuts and maize); research to determine if reducing EED will improve oral vaccine performance; measures of cognitive function at two years of age; and an investigation of the role of the intestinal microbiota. The importance of the microbiota has been demonstrated by studies in which transplantation of donor faeces from children with severe acute malnutrition (SAM), but not their healthy twins, led to weight loss in germ-free mice fed a typical Malawian diet, while increases in body mass and fat mass were induced in mice transplanted with donor faeces from obese adults, but not their lean twins. Taken together, these studies suggest that the microbiota has a causal effect on child growth. Given this association, the SHINE study now has a sub-study that is investigating the role of microbiota in stunting.

SHINE is funded primarily by the Bill and Melinda Gates Foundation and DFID, with additional contributions from the Wellcome Trust, Swiss Development Corporation, the US National Institutes of Health, and European Union. Although results are not officially ready until next year, Jean was happy to share two preliminary findings from SHINE. The first is that there has been considerable success with the WASH messaging and its impact on behaviour change (see end of article for source of more info). The second has been that the exclusive breastfeeding (EBF) intervention implemented as a blanket intervention across all treatment arms, increased EBF during the first 2 months of life from 60 to 85%; during months 3-4 from 30% to 85%, and from 15% to 67% during 5 and 6 months of age. The intervention addressed two specific misconceptions that had previously led to early interruption of EBF in this context. These were that feeding cooking oil and other non-breast milk foods would facilitate closing of the open fontanelle and would comfort a colicky crying baby (Desai et al, 2014).

SHINE is designed to answer the following questions. If children are consistently protected

from ingesting faeces, will they grow taller and if they consistently receive a nutritionally adequate diet, will they grow taller? If these two interventions are implemented simultaneously, will the effects on growth be additive? To do this, the trial must have very intensive interventions to achieve the highest possible adherence to the promoted behaviours - it includes many contacts and the modules are based on 5-7 years of formative work resulting in messages most likely to stimulate change in key behaviours. The programme provides latrines and handwashing facilities with monthly renewal of soap supplies to mothers in the WASH arms, and it provides Nutributter, a lipid paste nutrient supplement containing all infant micronutrient requirements. Jean explained that they "could have chosen to use less intensive interventions that might be more immediately "scalable" but if the trial failed to make children grow, we'd never know if the failure was due to WASH not being an effective intervention, or if the WASH intervention was never really tested because it was never fully implemented and taken up. Thus, once we clearly understand what causes stunting and what must be done to prevent it, much work will be needed to develop programmes that are less expensive and have longer term sustainability".

Jean concluded by saying that her hope is that this study will help us understand more fully the value of WASH programming and that we will know more about the roles of WASH, EED, mycotoxin exposure, and diet in optimising linear growth, which can then help inform the direction of future programming and policies to address stunting more effectively.

Details of the WASH intervention, along with WASH modules and tools (Supplementary Materials) can be found online at: http://cid.oxfordjournals.org/content/61/suppl_7.toc.

References

Desai A, Mbuya MN, Chigumira A, Chasekwa B, Humphrey JH, Moulton LH, Pelto G, Gerema G, Stoltzfus RJ; SHINE Study Team, 2014. *Traditional oral remedies and perceived breast milk insufficiency are major barriers to exclusive breastfeeding in rural Zimbabwe*. *J. Nutr*;144(7):1113-9.



SHINE Project

People in aid



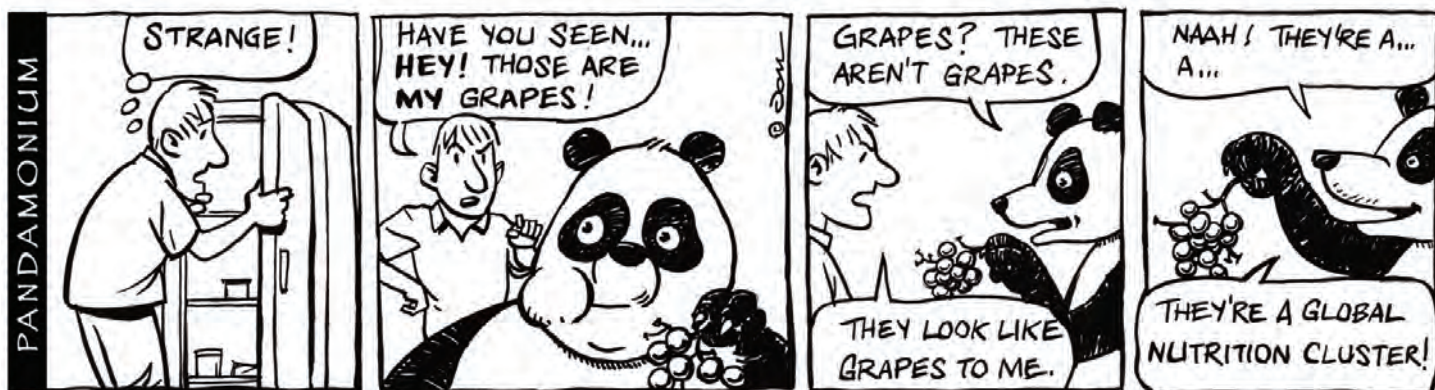
Participants in the USAID/SPRING West Africa Multi-sectoral Nutrition Strategy Global Learning & Evidence Exchange workshop in Accra, Ghana, January 2016



Participants in the Nakuru media training organised by the SUN Civil Society Alliance in Kenya (see field article, this issue)



Participants in the USAID/FANTA Multi-sectoral Nutrition Strategy Global Learning & Evidence Exchange workshop in Dar Es Salam, Tanzania, March 2016



Editorial team

Jeremy Shoham,
Marie McGrath,
Chloe Angood,
Emily Mates,
Nick Mickshick.

Office Support

Claire Reynolds,
Clara Ramsay,
Peter Tvetret,
Judith Fitzgerald,
Raquel Lorensu.

Design

Orna O'Reilly/Big Cheese Design.com

Website

Phil Wilks

Contributors for this issue:

Amelia Reese-Masterson	Shiromi Michelle Perera
Masumi Maehara	Isabelle Modigell
Mark Murage Gathii	Christine Fernandes
Casie Tesfai	Megan Gayford
Bethany Marron	Abu Ahmed Shamim
Anna Kim	Kathrin Tegenfeldt
Irene Makura	Kerry Aradhya
Titus Mung'ou	Tarana Ferdous
Aashima Garg	Nasrin Banu
Anthony Calibo	Sumitra Roy
Rene Galera	Raisul Haque
Andrew Bucu	Saydur Rahman Siddiquee
Rosalia Paje	Mosiqure Rahman
Willibald Zeck	Nazma Shaheens
Cecilia De Bustos	Ellah Kedera
Cécile Basquin	Meghan Anson
Christiane Rudert	Emily Faerber
Felix Pensulo Phiri	Jennifer Weiss
Dr. Saja Abdullah	Amy Webb Girard
Dr. Rasha Al Ardi	Ann Burgess
Dr. Rajia Sharhan	Dr Vibhavari Dani
Amelia Reese-Masterson	Dr Ashish Satav
Pamela Murakwani	Mrs Jayashri Pendharkar
Laura White	Dr Kavita Satav
Sophie Goudet	Dr Ajay Sadanshiv
Caroline W. Wainaina	Dr Ambadas S Adhav
Teresia N. Macharia	Dr Bharat S Thakare
Milka N. Wanjohi	Tanya Khara
Frederick M Wekesah	Valid India Trust
Peter Muriuki	Erin Lisemby
Betty Samburu	Lauren Browne
Paula L. Griffiths	Paul Binns
Elizabeth W. Kimani-	Tui Swinnen
Murage	Tamsin Walt
Aashima Garg	Mark Manary
Andrew Rene Bucu	Lenka Blanárová
Rene Gerald Garela	Sophie Woodhead
Samson Desie	Mark Myatt
Andrew Musyoki	Jose Luis Alvarez
Anuradha Narayan	Natalie Sessions
Josephine Ippe	Anne-Dominique Israel
Valerie Gatchell	de Monval
Carmel Dolan	Yara Sfeir
Anna Ziolkovska	Michael Loevinsohn
Michael Golden	Ismail A.R Kassim
Sarah Neusy	Isaack Manyama

Thanks to all who contributed photos (credits included with images) and to the WFP Photo Library as a valuable source.

Front cover

One of the IMC lead mothers in an adolescent support programme; Shiromi M. Perera, IMC, Nigeria, 2015.

Back cover

Yemeni Internally Displaced People (IDPs) at a distribution center; Brekke Truls.

Correction

Fatima Adamu, Maureen Gallagher and Paul Xavier Thangarasa (2016). Child Development Grant Programme (CDGP) in northern Nigeria: influencing nutrition-sensitive social policy programming in Jigawa State. *Field Exchange* 51, January 2016. p104. Box 2 in the cited article was missing (duplicate of Box 1). The corrected article is available online: [HYPERLINK "http://www.enonline.net/fex/51/cdgpnigeria"](http://www.enonline.net/fex/51/cdgpnigeria)

About ENN

ENN is a UK registered charity, international in reach, focused on supporting populations at high risk of malnutrition. ENN aims to enhance the effectiveness of nutrition policy and programming by improving knowledge, stimulating learning, building evidence, and providing support and encouragement to practitioners and decision-makers involved in nutrition and related interventions.

ENN is both a core team of experienced and academically able nutritionists and a wider network of nutrition practitioners, academics and decision-makers who share their knowledge and experience and use ENN's products to inform policies, guidance and programmes in the contexts where they work.

ENN implements activities according to three major workstreams:

Workstream 1: Experience sharing, knowledge management and learning. This includes ENN's core products: Field Exchange, Nutrition Exchange and en-net, as well as embedded knowledge management within two key global nutrition fora (the Scaling Up Nutrition Movement (SUN) and the Global Nutrition Cluster (GNC)).

Workstream 2: Information and evidence on under-researched nutrition issues. This comprises ENN's research and review work on filling gaps in the evidence base for improved nutrition policy and programming.

Workstream 3: Discussion, cooperation and agreement. This includes a range of activities for discussing and building agreement and consensus on key nutrition issues. It includes ENN's participation in and hosting of meetings, its activities as facilitator of the IFE Core Group and its participation in the development of training materials and guidance, including normative guidance.

ENN's activities are governed by a five year strategy (2016-2020), visit www.enonline.net

The Team



Jeremy Shoham and Marie McGrath are Field Exchange Co-Editors and Technical Directors.



Carmel Dolan and Emily Mates are Technical Directors.



Chloe Angood is a nutritionist working part-time with ENN on a number of projects and supporting Human Resources.



Tui Swinnen is ENN's Global Knowledge Management Coordinator (SUN Movement)



Claire Reynolds is ENN's Senior Operations Manager, based in Oxford



Peter Tvetret is ENN's Senior Finance Manager, based in Oxford.



Clara Ramsay is the ENN's Finance Assistant, based in Oxford.



Judith Fitzgerald, is the Operations and Mailing Assistant at the ENN.



Orna O'Reilly designs and produces all of ENN's publications.



Phil Wilks (www.fruitysolutions.com) manages ENN's website.

A hearty thanks to Deirdre Handy who has proofed Field Exchange since the very early days of the publication. Her beady eyes and high standards of punctuation and grammar has kept the editorial team on the straight and narrow. We wish her all the very best (and welcome random spot checks at any time).

Field Exchange supported by:



Foreign Affairs, Trade and Development Canada

Affaires étrangères, Commerce et Développement Canada

The Emergency Nutrition Network (ENN) is a registered charity in the UK (charity registration no: 1115156) and a company limited by guarantee and not having a share capital in the UK (company registration no: 4889844). Registered address: 32, Leopold Street, Oxford, OX4 1TW, UK. ENN Directors/ Trustees: Marie McGrath, Jeremy Shoham, Bruce Laurence, Nigel Milway, Victoria Lack and Anna Taylor.





ENN

32, Leopold Street, Oxford, OX4 1TW, UK

Tel: +44 (0)1 865 324996

Fax: +44 (0)1 865 597669

Email: office@enonline.net

www.enonline.net

