

Field Exchange

Emergency Nutrition Network

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- **Resilient health systems in Ethiopia**
 - **Tribal livelihoods in rural India**
 - **School feeding in Nigeria**
 - **Managing SAM in Mali**
 - **Treating MAM in Madagascar**
 - **Monitoring nutrition spend in Uganda and Nepal**
 - **Mother support groups in Nigeria**
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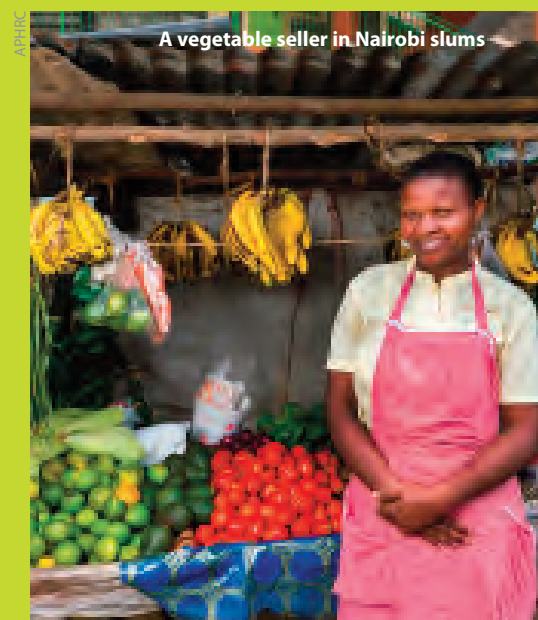
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Dear readers

This issue of Field Exchange speaks largely to the themes of scaling up and integration of nutrition programming, as well as multisector approaches to addressing undernutrition. If you add in 'resilience,' these are probably the most current pre-occupations of nutritionists and the broader development community.

Scaling up nutrition programming, whether under the umbrella of the Scaling Up Nutrition (SUN) Movement or not, is an obvious area where we urgently need to make progress. Coverage of nutrition-specific programmes, like treatment of acute malnutrition, are still woefully inadequate (see the articles on the *No Wasted Lives* Initiative and COR-TASAM, that are concerned with addressing exactly this). We know less about the coverage of nutrition-sensitive programmes and it would perhaps be unwise to try to specifically quantify coverage until there is greater clarity around definitions of this type of programme. What we can say, however, is that coverage is low – especially in fragile and conflict-affected states. The need to 'integrate' nutrition programming or elements of nutrition programming into existing health and other programming infrastructure requires little justification other than the fact that integration is key to sustainability and national ownership. It is the justification, focus and resources devoted to multi-sector nutrition approaches where arguments and rationale perhaps become more equivocal. Although cited as critical to address the majority of the global burden of stunting in the LANCET 2008 series, Field Exchange 51 (special issue on nutrition-sensitive programming) argued that nutrition-sensitive and/or multi-sector programming (terms often used interchangeably) are poorly defined and even more poorly evidenced in terms of impact (Editors, 2016). In the 18 months since this edition, researchers and knowledge management actors have continued to examine how multi-sector nutrition programmes are being enabled (particularly in SUN countries) and evidence for nutrition im-



Rawda Yassin Shareef/ SMOH, 2016

pact and the process by which impact is mediated (theories of change). Overall, it has to be said that there is slow progress – both in terms of our understanding of how and whether nutrition programming is changing on the ground to become more sensitive and multi-sectoral, and the evidence for nutrition impact of this approach. It must be asked, therefore, whether our efforts in scaling up so called nutrition-sensitive and multi-sector programming are perhaps a little premature in that there is so much investment in enabling the approach before we have evidence of what works and in what contexts. We can only hope that the 'leap of faith' proves to be justified as the evidence from pilot programmes and research continues to emerge.

One other question that may be worth considering is why we often appear to separate out the processes of 'scale up', 'multi-sector planning/programming' and 'programme integration' in our writing and deliberations (see articles in this issue of Field Exchange). What drives the delineation? Is it the institutional architecture, e.g. nutrition-specific programme scale up is often undertaken in sectoral silos or without integration into existing programming (humanitarian and development divide) or is it a conceptual convenience and if so whom or what purpose does this serve? Why wouldn't we always aim to scale up nutrition related programming in a way that ensures maximum synergy between sectors and as full integration within existing systems and infrastructure as possible? I'm afraid that these are simply reflections with no attempt to provide answers, although hopefully worthy of consideration.

So, onto the articles in this issue. A piece from Sudan written by the UNICEF team and the Federal Ministry of Health tells the story of scale up and integration of severe acute malnutrition (SAM) treatment into existing health services in what can only be described as a high burden low resource setting. The scale up led to a five-fold increase in cases treated, transitioning from a parallel humanitarian programme to a government-led integrated intervention. An interesting facet was that local production of Ready to Use Therapeutic Food (RUTF) increased 400 percent. Furthermore, government and development partners took on increasing funding responsibility for the programme. The many enabling factors for this successful programme included early government engagement, leadership and ownership; evidence of effectiveness and cost-efficiency; strong technical support from UNICEF and other partners; the formation of a community-based management of acute malnutrition (CMAM) Technical Working Group; and robust mentoring and monitoring. Another scaled up SAM treatment programme, this time in Ethiopia, is described by Amal Tucker Brown and Eric Alain Ategbo, UNICEF. Here, in response to the 2015-16 El Nino drought, SAM treatment was integrated into routine health services whereby the national community-based nutrition programme was scaled up quickly and to a high standard. An article by the USAID-funded SPRING project describes the rapid scale up of community videos to promote improved handwashing and complementary feeding in Niger and Burkina Faso. Evaluation found improved up-

take of recommended handwashing and complementary feeding behaviours, and qualitative data indicated greater involvement of men in household and child-rearing responsibilities. SPRING rapidly scaled up the approach to 248 villages in Niger and 90 villages in Burkina Faso through collaborations with local partners, concept testing to adapt the videos to local contexts, and capacity building of video production hubs. Actions to support sustainability included exploration of income-generating opportunities of hubs and handover to Ministry-led regional technical advisory groups. Finally, the SPRING teams in Nepal and Uganda have written about developing and piloting a methodology to analyse planned and actual spend on nutrition from a government perspective – contexts where national policies dictate the need for scaling up of nutrition programming. The article describes challenges around aggregated budgets, lack of budget expertise amongst nutritionists, lack of data on central transfers to districts and off budget data in both countries.

Several articles describe in more detail the integration of programmes, either into existing services or with each other. In Mali, ALIMA write about strengthening pre- and in-service training for treatment of complicated SAM at the URENI teaching hospital where 262 health professionals working in 41 health centres were trained. In Yemen, an article by the WHO team describes the in-service training and systems support provided for inpatient care of SAM which led to a mortality rate reduction from 8.3% to 4.5% between 2010 and 2013. Interestingly, one quarter of admissions were infants under six months of age. Also catering for this age-group, the team at GOAL have written an article about the successful integration of care for malnourished infants under 6

months of age into (CMAM) and primary health care services in two refugee camps using the community-based management of acute malnutrition in infants under six months (C-MAMI) tool.

A number of articles describe successful multi-sector programming or initiatives to promote multi-sector programming. An article by Salome Yesudas describes a multi-sector programme by 'Living Farms' in India targeted to the most marginalised tribes. The programme involved supporting stronger governance and strengthening food security, biodiversity, health service access and infant and young child feeding (IYCF). Inter-sector collaboration was identified as the key to success. An article by Welthungerhilfe and Concern Worldwide describes an ECHO funded, short-term integrated multi-sector project in Sindh province, Pakistan, involving CMAM, IYCF, water, sanitation and hygiene (WASH), livelihood and cash elements. The interventions were targeted to households with malnourished children in so called 'hot-spots'. The evaluation found significant improvements in IYCF, livestock milk production, and hygiene practices. However, only one third of households with malnourished children were reached with nutrition-sensitive components due to lack of resources and the level of waterborne disease and safe water access was not improved; the scale of intervention was beyond the capacity and timeframe of the programme. Lessons learned have been integrated into a follow-up project that includes an exit strategy transitioning SAM treatment to World Bank funded development programming. A piece written by Judith Kabore and Laure Serra, Action Against Hunger, describes work in West Africa to strengthen the capacity of civil society members to advocate for scaling up multi-sector programming over

three years. Local civil society actors from 12 countries created a Nutrition Champions Network. Activities included regional workshops and training on budget analysis, and integration of nutrition elements into other sector programming (increasing nutrition sensitivity).

There are numerous other articles in Field Exchange 55 covering topics as diverse as social behaviour change around food preparation and hygiene, and an innovative university-led 'Feed and Read' programme in Nigeria, that helps prepare marginalised highly vulnerable children for higher education and modern sector employment.

Once again this is a bumper issue and thank you to all the contributors. The process of pulling Field Exchange together has certainly changed since the early days, when editors had to speak to numerous potential authors to get buy-in to writing an article and then very often had to pursue (as politely as possible) potential authors for a first draft. Getting that first draft was often the critical point, as if an author (s) had invested time and energy to get it to draft stage, then they would usually want to see it through from there. We are now fortunate enough to have a consistent flow of 'unsolicited' ideas and material submitted to the team and long may this continue. As editors, we remain heavily engaged in the evolution of articles, providing feedback, suggestions and asking questions which we think will resonate most with you, the reader; in essence, a friendly peer review. As ever, we are very grateful to the busy individuals who take the time to document their experiences and accommodate our queries. Special thanks go to the French-speaking authors from ALIMA (Niger) and to APPEL (Madagascar), who handled our French/English conversations with endless patience. As a new principle, all field articles will be available in French online at: <http://www.enonline.net/fex> (click on the link). We have also translated into French a selection of articles from the last five editions of Field Exchange, that are being compiled into a special compilation edition for regional dissemination. This will be available online late September.

Finally, look out for our next issue of Field Exchange (56) which will be a special issue on the Nutrition Cluster with an editorial co-written by Josephine Ippe (Global Nutrition Cluster Coordinator) and Carmel Dolan (ENN Technical Director). It should be a good one!

Jeremy Shoham, *Field Exchange Co-editor*



Hondraj/TNDP

by Greg Sclama



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School feeding, Nigeria



Mainstreaming nutrition in a school-based feeding programme in northeast Nigeria

Location: Nigeria

What we know: Conflict often exacerbates existing weak services, which negatively impact on child nutrition and education, reducing development potential.

What this article adds: In northeast Nigeria, homeless boys are at risk of radicalisation and homeless girls are at risk of increased birth rate and associated infant mortality. In December 2015, the American University of Nigeria (AUN) began a *Feed and Read* programme for marginalised, homeless children excluded from formal education and dependent on religious schooling and begging to survive (a common feature in cities across northeast Nigeria). Two hours of basic literacy and numeracy education and a hot meal are provided every weekday. Initially targeting boys, the programme expanded to include girls. It has had strong community support, with good child academic progress and continues to expand. Nutritional review in 2017 reflected good energy and protein intake per meal but shortfalls in micronutrients; improved dietary diversity is planned. Plans are underway to assess the nutritional impact of the programme; baseline anthropometric, food consumption, health, hygiene and illness data has been collected (April 2017) for follow-up at endline. Future considerations will include use of fortified foods and strategies involving post-harvest processing, storage and school gardens.

Context and crisis

The devastating five-year insurgency led by militant group Boko Haram has exacerbated an already precarious human development situation in northeast Nigeria. The insurgency has caused vast destruction, killing over 20,000 people and displacing 2.1 million in the northeast, 57% of whom are children. While some have fled over borders to neighbouring Chad, Niger and Cameroon, the majority are displaced inside Nigeria, taking shelter in host communities in urban areas rather than in camps. This rapid urban influx has strained resources for basic services such as education and infrastructure, including water and sanitation. The United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) estimates that seven million people need assistance and 450,000 children risk severe acute malnutrition (SAM) across

the three most affected states; Borno, Adamawa and Yobe.

The insurgency exacerbates a dire situation in the region resulting from longstanding neglect and failure to provide basic services and development opportunities. Prior to the outbreak of violence, northeast Nigeria already had some of the lowest development indicators in the country. The World Food Programme (WFP) has noted consistently high rates of global acute malnutrition (GAM) in the affected region; between 10 and 15% over the past five years. Educational outcomes follow a similar pattern: less than 40% of children in northern Nigeria have attended primary school, compared to 90% in the country's south.

The long-term consequences of the lack of educational opportunities for girls and boys are

dire. Uneducated boys risk turning to violent crime or being radicalised. The lack of educational opportunities for girls leads to higher fertility and infant mortality in the region, the rates of which are already among the highest in the world¹.

Target population: Almajiri boys and internally displaced people

In northern Nigeria, boys without formal schooling lack marketable skills and have a low probability of being employed in the modern sector. This also puts downward pressure on the demand for education and creates a vicious circle of underdevelopment. Traditional and religious factors pressure many young boys to leave their homes to receive a Quranic education from mallams, traditional Muslim leaders. These itinerant Quranic scholars (IQS) or Almajiri are typically between the ages of 6 and 25, homeless and a common feature of cities across northern Nigeria. The children are typically from lower-class families, sent by their parents when few other options for education exist. In some families, one or more children may be sent to these schools while others may stay home and attend western-style schools.

The boys receive traditional Islamic instruction in Arabic, focused on increasing knowledge of the Quran. While the *mallams* may provide some basic needs and sustenance for the children, their means are extremely limited. As a result, the children often resort to begging or petty crime to pay their fees to the mallam or get enough to eat. These boys are extremely vulnerable: without a formal education and with limited economic opportunities, they risk resorting to violence or being radicalised or indoctrinated into insurgent groups, such as Boko Haram. The problem is vast: by some government

¹ Based on World Bank fertility rates (births per woman) <http://data.worldbank.org/indicator/SP.DYN.TFRT.IN>



School feeding, Nigeria

estimates, there are at least ten million Almajiri children in northern Nigeria.

Compounding the precarious situation of the Almajiri boys, many more children have become vulnerable in the region due to the insurgency. Following an outbreak of violence in 2014 perpetrated by Boko Haram, huge numbers of people were displaced, with many leaving rural areas for the relative security of urban centres such as Yola, the capital of Adamawa state. This influx put a tremendous stress on the already strained educational system. Without educational opportunities, girls often resort to street hawking, begging or other risky behaviours as a result of displacement. They are also vulnerable to early marriage and gender-based violence. Local institutions, church groups and agencies struggle to meet the needs of these children.

Organisation and approach: The American University of Nigeria

The American University of Nigeria (AUN) was founded in Yola in 2004 by Atiku Abubakar, a former vice-president of Nigeria. In addition to running elementary, secondary and university programmes on the American education model, AUN has a mandate to be a 'development university' for Africa and has an office dedicated to development and outreach programmes in the local community, the Atiku Centre for Leadership, Entrepreneurship and Development. In 2015, university staff and administrators recognised the growing number of Almajiri boys begging at the gates of the university and the surrounding neighbourhood. A programme was conceived with the objective of providing one nutritious meal and basic literacy and numeracy training to Almajiri boys from the community. As the programme recorded successes and resources increased, it expanded to include girls, especially those displaced from elsewhere

in the region by the violence. In the nearly 18 months since its inception, the Feed and Read programme has had successes and challenges. In addition to expanding its reach and educational impact, the Atiku Centre at AUN is now committed to improving the nutritional component of the programme.

Project experience and lessons learned to date

Inception and programme design

The AUN *Feed and Read* programme was started in December 2015. Its objective was to provide one healthy meal per day to vulnerable children, in addition to a curriculum of basic literacy and numeracy. Students attend single-sex instruction for two hours on weekday afternoons and receive one hot evening meal after the lessons. This is intended to support healthy growth and development and boost school performance. The educational curriculum covers basic literacy, numeracy and life skills such as handwashing and sanitary behaviours. The curriculum runs for eight months, with the goal of giving students a level of basic literacy and numeracy equivalent to second grade and placing them in the third or fourth grade on completion.

The basic education is intended to enhance students' knowledge of the world and reduce their susceptibility to being influenced by violent radical groups such as Boko Haram. Increased job opportunities through increased marketability would be long-term outcomes resulting from improved nutrition and education. The programme would therefore contribute to development by improving long-term development indicators such as female fertility and child and maternal mortality and by increasing future democratic participation.

Successes, challenges and scaling up

To ensure the success of the programme, AUN has sought the buy-in of the children's parents, guardians, mallams, other community members and state government officials. This was achieved by working through the Adamawa Peace Initiative, an organisation comprised of local religious leaders and AUN. The Almajiri boys' programme saw initial success, with strong community support and many boys willing to participate. After the initial success with boys, AUN received a grant from the Irish government of 18,578 euro to expand access to include girls. Starting with 50 girls, the programme expanded quickly to over 250 girls per day in summer 2016 and private donors were sought to support the growing programme needs. A new cohort began in January of 2017 of approximately 120 boys (aged 11-25) and 135 girls (aged 6-15). The programme hopes to reach over 1,000 students per year, although resource mobilisation for scaling up continues to be a challenge.

In October 2016, 200 boys and 75 girls received certificates of completion at the university's annual Founder's Day celebration, which recognised their success in front of the local community. At the end of the programme for the first intake of students, an end-line assessment

found that they had made a significant improvement based on the Early Grade Reading Assessment (EGRA) and Early Grade Mathematics Assessment (EGMA) exams. On successful completion of the programme, a number of Almajiris enrolled in formal schools.

Finding placement after graduation for all students has been a challenge, however, and some of the boys did return to their traditional Islamic education. AUN is trying to obtain sponsors to adopt students by paying for their fees to attend primary school. Despite completing the *Feed and Read* programme, the lack of prior formal secular education inhibits integration into the school system. There are also discrepancies between students and their academic competency levels: several of the boys are aged 18 years or older, which means they are too old for primary school. In these cases, the goal is to pair them with apprenticeships, entrepreneurial work or trades. For female graduates, it is hoped that the education exposure will break cultural taboos and that other parents will be more willing to educate their daughters.

Mainstreaming nutrition in the Feed and Read programme

The provision of healthy meals to students is a central component of the programme. A filling, nutritious meal increases students' health and wellbeing and allows them to perform better in lessons. It also increases demand for participation in the programme from children who may not otherwise receive a daily proper meal or who resort to begging. Programme staff have anecdotally observed that students' apparent health and attentiveness improved after participation in the programme; informal feedback from children and their caretakers confirmed the same. However, in January 2017, an Atiku Centre internal evaluation recognised that a more formal approach to tracking nutritional progress was necessary. The systematic collection and tracking of data would allow the programme to better meet the nutritional needs of students and demonstrate effectiveness in order to mobilise future sources of funding.

It was determined that the mainstreaming of nutrition in the programme would take two approaches: measuring and improving the nutritional value of food served and tracking student health and growth. Tracking would occur through anthropometry and qualitative questionnaires covering food consumption, hunger, coping strategies and health outcomes. To date, the nutritional value of the rations has been analysed and baseline anthropometry and questionnaires have been administered.

Nutritional analysis of typical meal served

At programme inception, community representatives identified women from the local community to cook meals of their choice; those who could handle changing programme needs were employed long-term. There is one cook each for the boys' and girls' programmes, which take place separately for cultural gender considerations.

Table 1 Nutrient values of an average portion of the typical Feed and Read meal served

	White Rice	Meat (Beef)	Tomato	Onion	Oil	Pepper	Mixed ground spices	TOTAL
Average Weight (g)	396.27	8.66	34.65	10.4	15.59	0.52	0.11	466.2
Energy (kcal)	531	27.2	9.7	4.68	140.35	0.2	0.37	713.5
Protein (g)	10.44	2.65	0.45	0.15	0	0.01	0.01	13.7
Fat (g)	0.91	1.85	0.08	0.01	15.59	0	0.01	18.46
Ca (mg)	19.81	0.95	5.2	3.01	0	0.07	0.71	29.76
Fe (mg)	2.13	0.42	0.21	0.03	0	0	0.01	2.8
Mg (mg)	53.34	2.17	4.5	0.73	0	0.06	0.14	60.94
Zn (mg)	1.68	0.49	0.26	0.02	0	0	0	2.47
Vit A-RAE (mcg)	0	3.29	66.62	0.02	0	3.28	0.09	73.3
Vit D (mcg)	0	0.07	0	0	0	0	0	0.07
Vit E (mg)	0.17	0.04	0.39	0.01	6.12	0.01	0	6.72
Thiamine (mg)	0.05	0	0.02	0	0	0	0	0.08
Riboflavin (mg)	0.05	0.03	0.01	0	0	0	0	0.1
Niacin (mg)	1.49	0.41	0.17	0.02	0	0	0	2.09
Vit B6 (mg)	0.15	0.02	0.03	0.01	0	0	0	0.21
Folate (mcg)	21.34	0.52	5.1	1.04	0	0.14	0.04	28.18
Vit B12 (mcg)	0	0.1	0	0	0	0	0	0.1
Vit C (mg)	0	0	8.03	0.44	0	0.58	0.04	9.09

In 2017, a deliberate attempt was made to standardise the meals and quantity of food served in programmes. Cooks were instructed to include protein in the form of meat or fish daily with the meal. In addition, efforts were made to standardise the serving size and to increase the size to meet the requirements of an 18-year-old. A nutritional analysis of a typical meal (white rice served with beef stew) was performed to examine the progress in reaching that goal. Usually composed of tomatoes, onions, peppers, oil and spices, there was some variation; cooks indicated they also may prepare jollof (spiced) rice, other vegetables such as spinach, spaghetti, white beans (cowpea), yam and occasionally yogurt.

Time, resources, and other practicalities (such as the sensitivity of cooks to staff visiting their kitchens) precluded the measurement of ingredients actually used by cooks during preparation. Instead, the recipe and proportions for ingredients in this 'typical meal' were determined by consulting recipes provided by popular national food brands. Programme staff then visited the *Feed and Read* sessions to measure the weight of actual meals served using a digital scale, correcting for the weight of the empty plate. The average weight of the meal was found to be 466.2 grams. Measurements were also made of the proportion of rice and stew; rice was found to constitute 85% of the meal by weight.

This analysis indicates the kind of meal consumed by students and provided a satisfactory starting point to make recommendations for programme improvement. After determining the relative weights of ingredients in the typical meal of average weight, nutrient values for each ingredient were determined using the *FAO West African Food Composition Table* (Stadlmayr, 2012) and accounting for nutrient losses during

cooking. These values were summed across ingredients to determine the total levels of each nutrient in the average serving. These nutrient levels are displayed in Table 1.

The final step involved determining the recommended nutrient intakes (RNI) for age and sex groups corresponding to students participating in the programme. RNI was selected as it represents the intake that meets the nutrient requirements of almost all (97.5%) of apparently healthy individuals in the population. Three physiological groups were examined: children aged 7-9 years, females aged 10-18 years and males aged 10-18 years. RNI values were taken from *Vitamin and Mineral Requirements in Human Health* (WHO and FAO, 2004). The nutrient levels in the typical meal were divided by the RNI for each group to determine the proportion of that group's recommended intake that would be met by a typical meal provided by the *Feed and Read* programme. These results are displayed in Table 2.

Discussion of the nutritional analysis of typical meal

The nutritional analysis of the typical meal revealed several important findings. A meal of average size, prepared according to the assumed recipe and proportions, provides approximately 714 calories, 14 grams of protein and 18 grams of fat (Table 1). Clearly this represents a very important source of nutrition for vulnerable Almajiri boys and displaced children of all age groups who would not otherwise eat such a daily meal.

It is understood that the *Feed and Read* programme provides the largest and most nutritious meal of the day for most of the students; therefore the ration would ideally meet 25%-33% of the daily micronutrient requirements for all students up to age 18. As shown in Table 2, however,

Table 2 Percentage of RNI met by the typical Feed and Read meal

	Children 7-9 years	Females 10-18 years	Males 10-18 years
Ca (mg)	4.25%	2.29%	2.29%
Fe (mg)	31.44%	8.56%	14.88%
Mg (mg)	60.94%	27.70%	26.50%
Zn (mg)	22.01%	17.12%	14.42%
Vit A-RAE (mcg)	14.66%	12.22%	12.22%
Vit D (mcg)	1.32%	1.32%	1.32%
Vit E (mg)	96.07%	89.67%	67.25%
Thiamine (mg)	8.92%	7.30%	6.69%
Riboflavin (mg)	10.70%	9.63%	7.41%
Niacin (mg)	17.40%	13.05%	13.05%
Vit B6 (mg)	20.69%	17.24%	15.91%
Folate (mcg)	9.39%	7.04%	7.04%
Vit B12 (mcg)	5.44%	4.08%	4.08%
Vit C (mg)	25.99%	22.74%	22.74%

Notes on Table 2: The analysis assumes a low bioavailability of zinc and a 10% availability of iron, consistent with the diets of poor populations heavily dependent on cereal staple foods, which contain inhibitors of mineral absorption. As the iron requirements for adolescents can vary greatly, especially between pre- and post-menarche females, the higher requirement was selected.

almost all micronutrients fall well below this target. As expected, the gap between the ration and the requirements is greater for older adolescents and males, who have higher nutrient requirements.

The analysis found that the nutrients meeting the highest proportion of recommended intake were vitamin E, magnesium and vitamin C. Those farthest from meeting the requirements were vitamin D, calcium, vitamin B12, thiamine, folate and riboflavin. Other nutrients of vital public health importance, such as iron, zinc, and vitamin A, also fell short of meeting the goal of 25% of daily recommended intake. This is primarily due to the high relative proportion of white rice, constituting 85% by weight. While rice provides an important and relatively low-cost source of energy, it has low levels of many other essential nutrients. Excessive refining and polishing of cereal crops such as white rice also removes important B vitamins such as thiamine and riboflavin.

Recommendations and moving forward

Improving the nutritional value of the meal

The first recommendation is to improve the proportion of beef stew to rice in the meal. While this will increase programme costs, it is attainable in the short run because it does not require any education or behaviour change on the part of the cooks. It could be implemented and monitored by using standardised utensils to ensure that students receive enough stew relative to rice and that all students receive the same portion.

The second recommendation is to improve the dietary diversity of the meals by incorporating more nutrient-dense vegetables and plant foods. An immediately actionable recommendation

would be to add several readily available and low-cost plant foods. These include carrots (vitamin A), cowpea/black-eyed pea (folate and iron) and spinach (vitamins A and C). Tomato is an important source of vitamin C and its quantity should be increased, or other sources of vitamin C such as oranges should be included.

In the long-run other animal-source foods such as chicken, liver, milk, yogurt and eggs can be incorporated into meals. Although relatively more expensive than plant foods, animal foods are important sources of iron, zinc, vitamin B12, vitamin A and other nutrients. Some other vegetable foods offer a more affordable source of vitamin A, especially carrots, dark vegetables such as spinach, and orange non-citrus foods such as mango and papaya. Pulses, legumes and nuts such as cowpea and groundnuts should be considered as they provide folate. These plant foods also supply phytonutrients and antioxidants which are important for health.

Challenges to the promotion of dietary diversification include the possibility that some of these foods, especially animal-source foods, may be expensive and others may be difficult to find or only available seasonally. There may also be challenges to incorporating them into familiar local meals. Therefore, local food experts should advise on how to develop nutritious and culturally appropriate recipes in consultation with the programme cooks. The programme could also educate cooks on improved preparation, processing and storage methods to maximise nutrient retention.

Tracking nutritional gains through anthropometry and survey data

The second approach to mainstreaming nutrition in the Feed and Read programme is to track student growth and health through anthropometry and qualitative surveys. Surveys were designed and administered to all students in the current intake of the programme in April 2017. The anthropometric data collected includes height, weight and mid-upper arm circumference (MUAC). In the survey component, students were asked to answer a brief questionnaire on topics including food-consumption recall, perceptions of hunger, hunger and coping practices, sickness and basic hygiene.

The next steps will be to analyse the data, which will provide a baseline for subsequent comparison. The same measurements will be taken at end-line to assess any growth and health improvements that students made during participation in the programme. The most important indicator for tracking growth will be Body Mass Index (BMI)-for-age (de Onis et al, 2007). Individual indicators will be compared against age- and gender-appropriate reference groups to classify participants according to severe thinness, thinness, obesity and overweight.

During the most recent intake of students, one major challenge was getting the baseline data collection done at the start of the programme. As a result of logistical challenges such as staff training, scheduling and obtaining scales, the data collection was delayed. Fortunately, the

programme has now obtained the necessary anthropometry equipment and will be able to perform timely data collection for future intakes based on lessons learned.

Tracking student health in this manner poses several challenges, most importantly attributing any gains made to participation in the programme rather than to external factors. Crucial periods of growth will have already taken place before participants joined the programme, and the eight-month period of participation may not be long enough to see any measurable anthropometric change, even if health improves. There may also be unmeasurable outside factors that negatively affect growth. For example, if students are chronically exposed to intestinal infections from unsanitary environments, they may be unable to utilise the nutrients provided during the programme.

A potential avenue for future research would be to set-up an experimental or quasi-experimental design using a control group of students. During each intake, there are students who are unable to participate due to capacity limitations. These students could be measured as the control group against which to compare the intervention group. These waitlisted students would then be given preference for admission in the next round of intakes, during which their continued progress would be tracked.

Other future avenues to improve nutrition

Several other areas of programmatic improvement remain to be explored. The use of fortified foods, especially oil, rice and flours, as well as micronutrient supplementation, should be considered. Partnerships should be made with local food processors for fortified foods and with health agencies and health-focused, non-governmental organisations (NGOs) to procure supplements. The partnerships with health agencies can also be leveraged to provide other health services, such as deworming and immunisations, which will improve school performance and overall health.

The programme may also consider other dietary diversification and modification strategies, such as post-harvest processing, storage and school gardens. In diets heavily reliant on cereal staples, processing methods such as soaking, germinating and fermenting can improve the nutritive value of essential minerals such as zinc and iron. Other food storage techniques that retain nutrition value, such as drying and canning, could be explored with local partners. School gardens could provide an effective means to teach children about nutrition, get them involved in a hands-on process and increase the availability of micronutrient-rich vegetables.

Conclusion

The AUN Feed and Read programme has made important strides in addressing the academic and nutritional needs of vulnerable children in the region. The experience to date has been successful on several fronts. The programme has received strong community support and

School feeding, Nigeria



has seen growing demand from children and families. Literacy and numeracy tests have demonstrated academic progress, with some graduates able to continue their education with placement in formal schooling.

Renewed priority has been given to improving the school meals and tracking nutritional growth. An analysis of meal composition suggests that the proportion and quantity of meat, vegetables and legumes relative to rice in the meals should be increased. Specifically, carrots, beans, spinach and tomatoes can address the gaps identified in micronutrients. The recently implemented efforts to track student anthropometry and health will both provide evidence of success and help identify additional areas for improvement.

Experience and analysis shows that there are still many channels through which the AUN can improve the nutritional component of the Feed and Read programme for vulnerable youth and street children. Each of these channels should be considered, explored and evaluated in terms of efficacy and cost-effectiveness. Rigorous tracking is an essential part of this process. This article summarises the first steps in such an approach, which can be scaled up and replicated to address nutritional priorities in a variety of school-based feeding programmes.

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References

- de Onis M, Onyango AW, Borghi E, Siyam A, Nishida C, Siekmann J. *Development of a WHO growth reference for school-aged children and adolescents*. Bulletin of the World Health Organization, 2007 Sept; 85(09), 660–667. http://www.who.int/growthref/who2007_bmi_for_age/en
- Stadlmayr B et al. *West African Food Composition Table*. Food and Agriculture Organization of the United Nations, International Network of Food Data Systems, Economic Community of West African States and Bioversity International (2012). Retrieved from <http://www.fao.org/docrep/015/i2698b/i2698b00.pdf>
- World Health Organization and Food and Agriculture Organization of the United Nations (Eds). (2004). *Vitamin and mineral requirements in human nutrition* (2nd ed). Geneva: Rome: World Health Organization; FAO. www.who.int/nutrition/publications/micronutrients/9241546123/en/



Women selling locally collected traditional foods, Rayagada District, India, 2012

Realising rights and livelihoods opportunities among tribal populations in rural India

By Salome Yesudas



Salome Yesudas works as a consultant with several organisations on local food systems and nutrition-sensitive agriculture, specialising in uncultivated foods, millet-based food systems and agrobio-diverse farming systems.

The author would like to acknowledge Debjee Sarangi, CEO of Living Farms, and Bichitra Biswal, programme officer for Living Farms, for their support in writing this article. The author would also like to acknowledge the support of Welthungerhilfe India. This article draws on content documented in a mid-term project progress report (Living Farms, 2014).

Location: India

What we know: Marginalised communities are particularly vulnerable to food insecurity and malnutrition.

What this article adds: Living Farms, a voluntary organisation in India, worked with 2,000 tribal households in 46 villages in Rayagada District, Odisha, between 2011 and 2017, targeting health, nutrition, agriculture, forest management and poverty alleviation. Baseline data reflected a poor community, with low literacy and education rates, poor access to government social protection schemes, poor uptake of antenatal care, excess infant and child mortality, and prevalent acute and chronic malnutrition. Working with government and harnessing traditional knowledge and practices, interventions included strengthening existing village institutions; development of kitchen gardens; promotion of dietary diversity and biodiversity through farming; and support for uncultivated food use. Mid-term review (2014) found improvements including greater access to government schemes and health services and improvements in dietary diversity and infant and young child feeding practices. Mortality rates and prevalence of acute malnutrition declined over the project period. Success factors include intersector collaboration between government departments and community mobilisation. Challenges included working within local power structures to negotiate changes in services.

Living Farms is a voluntary organisation founded in 2005 to improve food security and nutrition among marginalised farmers, landless agricultural labourers, forest-dependent communities and adivasis (indigenous, forest-dwelling communities) in Odisha, an eastern Indian state on the Bay of Bengal. Odisha is home to some of the poorest communities in the world; they are particularly vulnerable to food insecurity and malnutrition. Around 90% of communities that Living Farms work with in Odisha live below the national poverty line (Welthungerhilfe & Living Farms, 2011). This article describes the experiences of a Living Farms programme operating in Rayagada District, Odisha, over a six-year period (2011–2017). Rayagada District encompasses an area of natural beauty and covers an area of 7,073 km² (Figure 1). The population of the district is 831,000 (2011 census), is 86% rural, and comprises many races, cultures and languages. The district comprises 2,667 villages and is divided into 11 Community Development

Blocks (CDBs) for administrative purposes. It has a literacy rate of 64% (72% male; 56% female) against a national average of 59.5%. The district is ranked 465 out of 599 districts in India (US-India Policy Institute, 2015).

Living Farms programme

The purpose of the Living Farms programme is to improve key indicators related to food security, income and nutrition status. It takes a holistic approach, addressing issues related to health, nutrition, agriculture, forest management and poverty alleviation. The Living Farms programme in Odisha is a six-year programme (2011–2017) that harnesses traditional wisdom and farming. Farmers grow and maintain their own seeds (using seed banks); use traditional ‘multi-cropping’ (rather than single cash crops) and natural/organic fertilisers; and market their own produce. Communities are supported through workshops, awareness programmes, technical farming support, village health days and food

Figure 1 Map of Rayagada District



festivals to showcase community produce. The programme works closely with government officers from the Integrated Child Development Services (ICDS) scheme, health department officers, local government representatives and members of the School Management Committee (SMC). Living Farms started work with approximately 2,000 tribal households in 46 villages in the Bissamcuttack and Muniguda CDBs in 2011. This article describes some of the key intervention areas and progress captured in a mid-term (2014) project progress review (Living Farms, 2014).

Baseline study (2011)

A household survey on nutrition and education was undertaken in Rayagada District in August to September 2011; this served as a baseline for the Living Farms project. The survey was carried out by the Institute of Applied Statistics and Development Studies (IASDS), an India-based research institute, in partnership with Living Farms. IASDS provided technical support in data collection, analysis, reporting findings and making and applying recommendations. A total of 52 villages located in Bissamcuttack and Muniguda CDBs were covered and all households were targeted. Within households, target groups were pregnant mothers, mothers of children up to two years of age, children under five years of age (for nutritional status) and children aged five to 14 years (for educational status).

The study confirmed a predominately tribal population (92%), with the remaining minority made up of the Dalit¹ people. The overall gender ratio among adults was 1,091 females:1,000 males and 943 females:1,000 males for children (no explanation is given for this gender discrepancy in the study report). The proportion of children under five years old was reported to be 8.5%, well below the expected under-five population of 14–15% based on the state birth rate. The infant mortality rate² in the previous 12 months was 131 infant deaths per 1,000 (higher than the district infant mortality rate of 83 per 1,000). The major source of water in the area is tube well. Primary sources of income are wage labour (59.5%) and farming (39%), with people often involved in both. Migration for

employment is low; only 293 migrations were reported in the last 12 months.

Access to government schemes was assessed, including ration cards, NREGA³ and school mid-day meals. Out of 2,010 households, 93% possessed a government ration card. However, availability of food from ration shops under the Public Distribution Scheme (PDS) was found to be poor, with 85% of households reporting having not received food from ration shops within the last month and 11.3% reporting having never received food from ration shops. NREGA was found to be almost non-functional; more than 58% of respondents could not get work even for one day and only 0.4% of 1,340 households who had participated in NREGA schemes were given a job for the recommended 100 days.

Education enrolment was found to be poor. Out of 1,873 school-age children, 65% were enrolled in school (of whom 54% were male and 46% were female). Major factors that discourage school attendance are family size, absence of teachers and poor quality of teaching. In a reported 69% of schools in the survey area, a mid-day meal was served, consisting of rice, dal, eggs and vegetables. Access to antenatal care, healthcare and services to treat acute malnutrition were not examined in the baseline study.

The nutritional status of women was assessed using anthropometric measurements, including Body Mass Index (BMI) and Mid Upper Arm Circumference (MUAC) (MUAC only was used for pregnant women). Of 138 pregnant women surveyed, 19 (13.8%) were malnourished, with MUAC < 21cm. Of 285 mothers with children under two years of age, 21% had a MUAC < 21cm, of whom half (53%) had a BMI < 18.5.

Nutritional status of children under five years old (693 children) was determined using height-for-age z-score (HAZ) as a measure of stunting, weight-for-age z-score (WAZ) as a measure of underweight, weight-for-height z-score (WHZ) as a measure of wasting and MUAC. While the prevalence of stunting was found to be extremely high (75% stunted, of whom 55% were severely stunted and 20% moderately stunted), cautious

interpretation is necessary due to methodological flaws. Height was assessed using a tailoring tape in the baseline survey, with considerable possibility of data inaccuracy as a result. A height/length board was used in 2014 which should have improved accuracy but limits data comparability between studies (see 2014 mid-term study, reported later).

Nearly one quarter of children (23%) of children were wasted (12% severe; 11% moderate). About 62% of children were found to be underweight (34% severe; 28% moderate). Logistic regression analysis revealed that being in the age group 12 to 35 months and disease were major risk factors for malnutrition. Trend analysis based on single age revealed that underweight started accelerating from age eight months, peaking at 12 to 13 months.

Programme activities

Strengthening of existing village institutions

The project has enabled 46 kutumb⁴ to access government schemes (such as the NREGA, old age pensions and strengthening PDS systems) and to ensure health and nutrition security among the community. Kutumb meet monthly for discussion among community representatives and to facilitate joint action pertaining to farming, health and nutrition. Village health and nutrition days (VHNDs) are organised monthly to promote access to health and nutrition services. On VHNDs, children who are identified as malnourished are referred to Nutrition Rehabilitation Centres (NRCs) to receive 15 days of treatment, coupled with feeding counselling targeted at mothers, and follow-up. Parents are given travel fares to attend.

Another important village institution supported by Living Farms are Women's Rights Groups (WRGs), active in most of the project villages. WRGs consist of village women trained

¹ Dalit, meaning "oppressed" in Sanskrit, is the self-chosen name of this caste in India previously known as "untouchables".

² Deaths of infants under one year old per 1,000 live births.

³ Mahatma Gandhi National Rural Employment Guarantee Act, 2005. This offers to guarantee 100 days of wage employment per year to unskilled adult members of rural households.

⁴ Traditional village institutions.



Figure 1 (Cont'd) Materials developed as part of the Living Farms project



in the monitoring and identification of malnutrition and referral of severe acute malnutrition (SAM) cases, maternal and child health (MCH) programming (including prenatal, delivery and postnatal support, breastfeeding support, immunisations, nutrition awareness and education) and access to supplementary feeding schemes.

Progress assessed in 2014 found positive developments. MUAC was now assessed in 86% (19 out of 22) Anganwadi Centres (AWCs)⁵; this was previously not measured. Weight measurement and growth monitoring were being implemented in 15 VHNDs and weight measurement and haemoglobin count check-up of adolescent girls practiced in 18 AWCs. Service utilisation had also improved by 2014: 79% (161 out of 205) mothers accessed Janani Suraksha Yojana (JSY)⁶ in 2014; 99% mothers had accessed MAMATA Yojana⁷ (60% in 2013 and 47% in 2012); 93% of pregnant mothers were receiving supplementary nutrition from Anganwadi centres; and 99% of children accessed complete immunisation during 2014. In terms of feeding and care practices, early initiation of breastfeeding was reported as practiced in 93% of infants; 78% mothers practiced handwashing before feeding their children; and 74% of infants under six months old were exclusively breastfed.

Promoting nutrition gardens

A total of 1,012 farmers out of 2,016 households from 46 villages were supported to develop nutrition gardens in their homesteads, growing 14 plant varieties, including fruits, greens, tubers and spices. Most farmers used their own seeds and did not use synthetic fertiliser or pesticide, instead using organic manures they prepared using local resources. Mid-term review found that, on average, each household harvested and consumed 40kg of green vegetables over a period of 45 days from September to October 2014. Nutrition gardens were also established during the project period in 12 village schools (out of a total of 28 schools in the target villages). SMCs and community members helped prepare the fencing and plough the land; children and teachers were also involved in the preparation process. Out of 12 schools, seven reported to have had a good harvest. On average, the schools harvested approximately 60kg of different varieties of vegetables, which were used in school mid-day meals over two months.

Promoting dietary diversity (DD) and biodiversity through farming

Living Farms promoted millet-based, mixed farming to replace cotton farming, with uptake among 1,350 farmers in the project villages on 1,850 acres of land with 35 to 40 crop varieties in each of the patches. These included 18 varieties of millet, nine pulses, four oil seeds and five tubers. Crop diversity was planned in line with the traditional food culture to enable a diverse, balanced diet that included carbohydrates, proteins, fat, vitamins and minerals.

Supporting the use of uncultivated food

Uncultivated food has been the major source of food for local communities for generations and conserving the traditional uncultivated food sources was central to the project. To this end, 38 of the project villages protested against commercial plantation of eucalyptus and teak, driven by the forest department, and advocated for the regeneration and conservation of the biodiversity of the forest. Twelve villages planted around 25,000 multipurpose trees in degraded parts of forest land, including mango, jack fruit, guava, black berry, mahua, barada saga, kendu and karanja. Around 65% of the saplings survived and are being cared for by the communities.

Village kutumb have sought to promote traditional foods to the younger generation through recipe festivals, where village elders share recipes, explaining the value of traditional foods for healthy living, and teach how and when to collect such foods. A national convention and exhibition on uncultivated food, 'Food, Forest and Ecology' was organised in New Delhi, where participants from across the country exhibited the rich heritage and diversity of uncultivated foods and

⁵ A type of rural mother and child care centre and part of the government ICDS programme.

⁶ A government safe motherhood intervention in rural areas to reduce maternal and neonatal mortality.

⁷ An Odisha state scheme of conditional cash transfers to pregnant and lactating mothers.

demonstrated recipes. The Women and Child Development Minister and Secretary of the Ministry of Tribal Affairs attended the exhibition and a documentary film entitled *I Can't Give My Forest To You* was released at the convention. This provided a platform for dialogue to consider the promotion of traditional 'forest food' as an important policy to tackle malnutrition.

The Government of Odisha, influenced by the Living Farms project, has incorporated the promotion of forest food/uncultivated foods into various state programmes in nine tribal districts as a strategy to address food and nutrition, with support from IFAD, WFP and DFID.

Promotion of dietary diversity

DD scores for all households in the project villages were documented in 2012, using FAO and FANTA standard dietary diversity assessment methods⁸ (FAO & USAID, 2016). All available foods were listed and 16 food groups were formed by the community. DD scores for households were documented for three seasons (summer, rainy season and winter) and overall DD scores. Food groups were designated cultivated or uncultivated and according to nutritional value and colour. Foods were also broadly divided into 'go foods', 'grow foods' and 'glow foods'. Based on these classifications, posters were designed incorporating information on micronutrient-rich foods, with specific food sources for calcium, phosphorus, iron, vitamin C, folic acid and beta-carotene, and seasonal food calendars.

The posters were printed in Oriya language and distributed to every household as a wall poster. Based on the same food list, pictures of the food groups were incorporated into an Indian flag that simplified the go, grow and glow foods message. These tools were also used as a basis for discussion in monthly kutumb and WRG meetings and promoted during VHNDs. The DD assessment was repeated in April 2017 and is currently undergoing analysis.

Mid-term survey (2014)

A mid-term survey was completed in August to September, 2014. Twenty-eight villages were surveyed, including anthropometric assessment of 457 children aged six months to five years. Overall sex ratio was 1:1; half the children surveyed (53.6%) were aged 6-29 months. Distribution by age and sex of the sample population

is displayed in Table 1. The villages were selected from 52 baseline villages assessed in 2011, based on those villages with the greatest number of children under two years of age and pregnant and lactating women (PLW). The survey suggests a 13% reduction in the neonatal mortality rate⁹ (36 in 2014; 41 in 2011) and a fall in the infant mortality rate (131 in 2011 to 85 in 2014) over the three-year period. The prevalence of global acute malnutrition (GAM) was 17.1%; SAM was 3.5%, lower than the baseline in 2011 (23% and 11% respectively). The prevalence of moderate acute malnutrition (MAM) was higher in 2014 compared to 2011 (13.6% v 12%). Prevalence of stunting in 2014 was 57.4%. Comparative analysis between 2011 and 2014 is limited as there was no control group, and a different method to assess height was used between surveys that would impact on WAZ and HAZ indicators (see earlier). Confidence intervals are also not available for 2011 data to facilitate interpretation.

Discussion and conclusions

Under the Living Farms programme, 2,010 households from 46 villages were reached in the Ryagada District of Odisha, as well as 28 schools and 22 ICDS centres. Existing village institutions were strengthened to improve health and nutrition monitoring and access to government schemes. Dietary diversity was promoted among villagers and capacity-building activities were undertaken to improve farming techniques, establish nutrition gardens and promote biodiversity, conservation of forests and the use of uncultivated, traditional foods. A mid-term assessment indicated a decline in neonatal mortality and infant mortality over the initial programme period (2011 to 2014) and possible reductions in prevalence of GAM and SAM. While these data must be interpreted with caution, they suggest that the Living Farms programme has had a positive impact on the nutritional status of children in the area.

A key factor in the success of the programme is intersector collaboration. The programme brings together multiple government departments and facilitates meaningful collaboration around the goal of improved nutrition. As a result, several government programmes in the area became more 'nutrition sensitive'. For example, the quality of the snack provided to children in the ICDS programme improved (they are now

given a millet-based snack) and anthropometric measurements were more accurately taken due to improved oversight of the project. Also, education posters were provided to all ICDS centres and households, raising awareness of dietary diversity and nutrition. Living Farms has also built the capacity of government staff, such as Anganwadi community health workers, to improve service delivery within the population.

Community mobilisation is another important success factor. Using existing village structures, Living Farms has supported traditional systems, gaining community trust to plan and rapidly roll out programme activities within the population. Due to Living Farms activities, traditional farming practices and the use of uncultivated, forest foods were revived within the population; a key Living Farms success.

Key challenges of the programme were working within the local power structures; at times, these can hinder community action. Some traditional practices that had a negative impact on the health and nutrition of the community were deep-rooted and difficult to change. In addition, some government programmes ran contrary to the programme's objectives and it was sometimes difficult to find agreement on the way ahead. For example, iron and folic acid tablets were distributed to mothers without proper dietary advice and education and without monitoring. Finally, there were important methodological flaws in both the baseline study in 2011 and repeat assessment in 2014 that limit the comparability of results and the extent to which changes can be attributed to the Living Farms programme. These should be addressed in future assessments to help understand the impact of the programme better.

In conclusion, a combination of local knowledge and up-to-date practices alongside effective communication tools and constant engagement of local communities have brought about positive changes in the diets of the local population to improve their health and nutrition.

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⁸ A repeat of the DD assessment was carried out in April 2017. Results are forthcoming.

⁹ Deaths of infants aged 0-28 days per 1,000 live births.

References

- FAO & USAID, 2016. *Minimum Dietary Diversity for Women: A Guide to Measurement*. Food and Agriculture Organization of the United Nations and USAID's Food and Nutrition Technical Assistance III Project (FANTA), FHI 360 Rome, 2016. www.fao.org/3/a-i5486e.pdf; www.fantaproject.org/monitoring-and-evaluation/minimum-dietary-diversity-women-indicator-mdw
- Living Farms, 2014. *Realisation of rights and livelihood opportunities in rural India: Project progress report, July to December 2014*.
- US-India Policy Institute, 2015. District Development and Diversity Index. Accessed October 28, 2015. www.usindiapolicy.org/updates/general-news/225-district-development-and-diversity-index-report.
- Welthungerhilfe and Living Farms (2011) *Household economy approach Rayagada District, 2011*, Fact Sheet, Working version 3. Vlker Lennart Plan, University of Marburg.

Table 1 Prevalence of acute malnutrition based on WAZ scores (and/or oedema) and by sex, 2014 survey, Rayagada District

	All n = 457	Boys n = 229	Girls n = 228
Prevalence of global acute malnutrition (<-2 z-score and/or oedema) % (n)	17.1% (78) (21.4 - 13.5, 95% C.I.)	16.2% (37) (10.6 - 23.8, 95% C.I.)	18.0% (41) (13.1 - 24.1, 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 z-score and >= -3 z-score, no oedema) % (n)	13.6% (62) (10.3 - 17.7, 95% C.I.)	11.8% (27) (7.4 - 18.3, 95% C.I.)	15.4% (35) (10.5 - 21.9, 95% C.I.)
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema) % (n)	3.5% (16) (2.1 - 5.8, 95% C.I.)	4.4% (10) (2.3 - 8.0, 95% C.I.)	2.6% (6) (1.1 - 6.0, 95% C.I.)

By Dr Malam Kanta Issa



Dr Malam Kanta Issa has worked as the Head of Mission for ALIMA Mali since 2015. After obtaining his doctorate in

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URENI Ecole's interns during practice session, Mali, 2016

Building health service capacity to manage severe acute malnutrition in Mali

Xaume Ollerias, Mali, 2016

Location: Mali

What we know: Well-trained health professionals are needed to ensure quality inpatient treatment of children with severe acute malnutrition (SAM).

What this article adds: In Mali state capacity to provide quality inpatient treatment for SAM with complications is limited by damage to health infrastructures, staff shortages and high staff turnover, and lack of sustained, high-quality pre-service and in-service training for health professionals. A Units of Recovery and Intensive Nutrition Education (URENI) teaching hospital was established in 2015 by AMCP/ALIMA with UNICEF and Ministry of Health support to deliver a three-week, intensive, hands-on training on complicated SAM treatment for selected staff. Regional nutrition focal points (NFPs) from five districts (who monitor the integrated management of acute malnutrition) received refresher training. From 2015 to 2017, 262 Malian health professionals were trained from 41 health facilities through 22 training courses. All trainees passed the training (50% or above in final evaluation) and returned to their URENI with agreed action plans to implement changes. Plans are to train health professionals from conflict-affected northern regions not yet covered, pending funding..

Context

Mali currently has the sixth-highest infant mortality rate in the world (UNICEF, 2016) and ranks 175 out of 190 in the Human Development Index (UNDP, 2016). An annual population growth rate of 3.6% and a total fertility rate of seven children per woman contributes to constrained household resources, negatively impacting child health and nutrition. Acute malnutrition is a serious public health problem, exacerbated by the 2012 political and security crisis. Prevalence of severe acute malnutrition (SAM) is 2.1% (caseload of 142,527 children) and prevalence of global acute malnutrition (GAM) is 10.7% (622,368 children) (INSTAT, 2016). Nearly 20% of SAM cases, or more than 28,000 children, are likely to have medical complications that require inpatient treatment. Without such treatment there is an imminent risk of mortality.

Treatment of SAM in Mali

Mali has 65 Units of Recovery and Intensive Nutrition Education (URENI), where inpatient

care for SAM children with complications is provided. URENI are usually integrated into the paediatric service within the reference health centre (CSREF), a secondary healthcare facility at the district level¹. However, the ongoing crisis in northern Mali has severely hampered the state's capacity to provide quality care for children with SAM due to damage of health infrastructure and equipment, looting of medical supplies and the massive outflow of qualified medical staff. Public use of health facilities is constrained by cost, access and perceptions of the quality of care provided. Major shortages in human resources in health facilities are a critical concern (Human Resources Statistical Yearbook of Health, Social Development and the Advancement of Women, 2016). In 2016, the ratio of health professionals (doctors, midwives and nurses) in the country was 5.2 per 10,000 inhabitants. This figure, which includes state professionals and private, part state-owned and religious organisations, is well below the WHO standard (23 per 10,000). This problem is particularly marked in rural areas: the ratio falls to 3.9 health pro-

fessionals per 10,000 inhabitants when the capital, Bamako District, is excluded. Poor availability of qualified health staff in remote areas is further complicated by the security situation in central and northern regions of the country.

ALIMA in Mali

The Alliance for International Medical Action (ALIMA) is a medical humanitarian organisation created in 2009. It brings together the medical expertise of international humanitarian workers, national medical NGOs and global research institutes to provide quality medical assistance to the most vulnerable and conduct research projects to advance humanitarian medicine. ALIMA operates in the Sahel (Niger, Mali, Burkina Faso and Chad), the Democratic Republic of the Congo, the Central African Republic, Guinea, Cameroon and northern Nigeria. Its regional office is in Senegal.

ALIMA operates in Mali with its national partner, the Medical Alliance Against Malaria (AMCP), founded in 2010. In the Koulikoro region, AMCP/ALIMA have been present since 2011 in the districts of Fana, Dioïla, Kolokani, Oulélessébougou, Kangaba and Koulikoro, supporting nutrition and health treatment in government health structures. The project supports 111 community health centres (CSCOMs), which operate at health area level, and six district CSREFs in caring for children under five years old with SAM and malaria. AMCP/ALIMA has also been present in the Timbuktu region since March 2012 to meet the health needs created by the crisis in northern Mali and has supported the health structures in the districts of Diré and Goundam since 2012. At the end of 2016, AMCP /ALIMA supported all health structures in the district of Diré (one CSREF and 18 CSCOMs) and two thirds of the functional health structures in the district of Goundam (one CSREF and 17 CSCOMs). In Diré and Goundam the project focuses on access to free, high-quality primary

¹ There are four health divisions in Mali: state, region, district and health



Dioila Referral Health Centre

and secondary healthcare, including support for paediatrics, maternity, internal medicine and surgery.

Gaps in health staff competencies

Although treatment of malnutrition should be considered a public health priority, Malian health professionals lack competence in this area. Modules dedicated to the treatment of malnutrition and the management of SAM with complications rarely feature in standard training curricula for Malian doctors. In addition, the academic curriculum in Mali lacks practical training in important aspects specific to the nutritional and medical treatment of complicated SAM, such as diagnosis, additional examinations indicated, medical supervision, delivery of emergency treatment, management of complications (such as rehydration, transfusions and oxygen therapy) and compliance with hospital hygiene standards. As a result, there is great potential for medical errors, leading to increased mortality. Beyond the gaps in the theoretical and practical knowledge of health staff, ongoing training in treatment protocols related to malnutrition and associated pathologies often suffers from a lack of rigour and continuity. These issues are compounded by high staff turnover in marginalised areas that generates substantial recurrent training needs for those treating particularly marginalised and vulnerable populations.

Short-term capacity development

Non-governmental organisations (NGOs) support URENI and CSREF capacity development through annual updates on best-practice medical and nutritional care for medical staff. However, these training courses are short-term interventions carried out by non-permanent organisations. In addition, in 2017 there was a sharp reduction in support from financial partners for nutrition activities in the country, which led to decreased NGO support for nutrition activities to health districts. State funds have not yet been provided to compensate for this change and are likely to remain low and insufficient. The humanitarian aid appeal for Mali in 2017 includes a request for US\$58 million for nutrition interventions; yet to date only 11% of these resources have been mobilised (OCHA, 2017). This lack of funds, coupled with inadequate human resources, increases the risk of deterioration in the quality of care and child mortality.

Building competencies: URENI teaching hospital

In response to these needs, the URENI teaching hospital was set up by AMCP/ALIMA in Dioila during the second half of 2015 in partnership with UNICEF and the Nutrition Division (DN) of the Ministry of Health (MoH). It is integrated within the CSREF in Dioila. Its objective is to strengthen the skills and knowledge required for the inpatient care of severely malnourished children. The project focuses on addressing obstacles in providing high quality of care in the URENIs, as observed by AMCP/ALIMA since 2011. A three-week training programme was established at the URENI teaching hospital based on educational modules validated by the DN of the MoH and UNICEF and is supervised by experienced medical staff.

Hands-on training

The training is based on the 'learning-by-doing' method, which allows both reflective observation and active engagement of trainees, who learn through practice. Skills and knowledge are acquired by trainees who accompany the nurses and doctors of Dioila CSREF in the nutritional and medical care of SAM children with complications. Trainee doctors conduct joint visits to the URENI and paediatric ward with the responsible physician. Trainee nurses work in pairs with URENI nurses; the ALIMA deputy supervisor nurse guides the trainees in acute and transition phases while the ALIMA senior nurse accompanies them in intensive care, to provide close educational support.

Daily medical meetings are held to discuss complicated cases in depth. Weekly medical meetings are also held for the Dioila medical team and trainees to review complicated clinical cases, deaths and causes of mortality. In addition, thematic presentations are made twice weekly; topics are selected according to the needs identified by the pedagogical supervision team and have included SAM monitoring, SAM rehydration, calculation of therapeutic food doses and administration of drugs, procedures in the case of exposure to blood, transfusion prescription and monitoring, emergency treatment of shock, hospital hygiene, and preparation of therapeutic milk and diet for SAM children.

Trainees spend time at the pharmacy to understand pharmaceutical management principles (storage organisation, drug conservation and tools for pharmacy management such as stock

Field Article

sheets, application of FEFO (first-expired, first-out) rules on expiry dates and the principles of cold chain management). In addition, trainees spend time with the logistician and hygienists on waste management and sanitation in Dioila CSREF. This covers subjects such as correct sorting and incineration of waste and preparation of chlorine solutions for decontamination of different tools/equipment. The doctor in charge of Dioila URENI tutors trainees on human resources (HR) management, pharmacy management (elaboration of nutritional and medical orders and the importance of carrying out regular inventory and follow-up of drug consumption) and medical data analysis.

Trainee evaluation

Trainees' knowledge and skills/competencies are evaluated at three stages: the beginning of training (to measure initial knowledge and skills), mid-term (to measure knowledge and skills gaps to adapt the training to meet identified needs) and at the end (to measure acquired knowledge and skills).

Theoretical knowledge is evaluated through a written test that presents a series of yes/no questions and examination of practical cases (such as admission and discharge criteria, complications associated with SAM, detection of nutritional oedema, administration of therapeutic milk, treatment of dehydration and surveillance of SAM children). Practical skills are evaluated by the supervising team through daily observations of clinical practice.

Different practical and theoretical evaluations are used for trainee doctors and trainee nurses via an evaluation grid of quality standards in each phase of treatment. For example, in the acute phase trainee doctors must master around 40 technical competencies, grouped into six categories: diagnosis and treatment of SAM with complications, treatment of breast-fed infants under six months old or infants weighing less than 3kg, medical activities (for example, use of a urinary catheter, use of an intravenous needle and performing a lumbar puncture), record-keeping, quality of medical prescriptions and data analysis.

Evaluation standards are based on the national protocol for integrated management of acute malnutrition (PECIMA) and trainees must obtain a score of at least 50%. If a trainee does not meet the required standard by the end of the training, they are referred to UNICEF to liaise with the CSREF of origin to arrange a plan for specific support. As trainees are evaluated three times and closely supervised throughout the internship, to date none have obtained a score below 50%.

Trainees also formulate their own expectations regarding the internship and themes they would like to cover during their training and identify five objectives they would like to achieve by the end of the internship. The trainees are responsible for implementing the protocols and care practices learned during the training in Dioila within their local CSREF. At the end of the programme,

trainees draw up an action plan for the management of SAM cases in their local CSREF based on their knowledge of materials and human resources available in their CSREF of origin. This document helps guide the trainees once they return to their own URENI and contributes to the spread of good organisational and management practices in healthcare facilities.

Refresher training of nutrition focal points (NFPs)

Regional nutrition focal points (NFPs) oversee monitoring the integrated management of acute malnutrition (PECIMA) at the regional level and have an important role in the supervision and evaluation of the URENIs and their staff. They are employed by the DN, which is part of the National Office for Health, under the responsibility of the MoH. One NFP per sanitary district has been deployed in accordance with the PECIMA. Monitoring and evaluation tools used by NFPs include a performance evaluation grid, designed by the MoH to monitor and evaluate the URENIs. Data provided by NFPs are reviewed by each Regional Health Director and then sent to the national-level DN. The NFPs in Koulikoro, Bamako, Mopti, Ségou and Kayes have benefited from a refresher course at the URENI school, helping to improve their techniques for monitoring and evaluating all URENIs. NFP training focused on frequency of supervision, use of existing monitoring tools, editing supervision reports and data collection. The follow-up plans produced by trainee doctors and nurses in their region were shared with the relevant NFP.

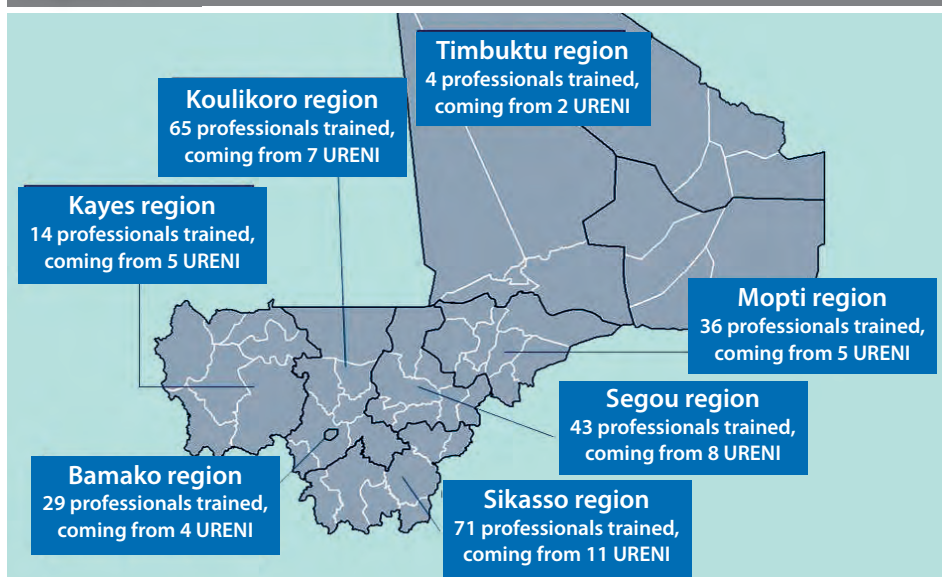
Outcomes of the URENI teaching hospital training

Between August 2015 and April 2017, the project trained a total of 262 Malian health workers, including 67 doctors from 41 health facilities. Figure 1 displays the regions from which health workers originated. Trainees were identified by UNICEF in collaboration with the CSREF of origin and ALIMA. Priority was given to CSREFs that were not supported by an NGO for nutritional activities. The trainees were evaluated on 40 medical and nursing procedures. The 22 training courses delivered had a 100% success rate (all trainees scored above 50% on final examination). At the end of the practical training, all participants could apply national and international care standards for SAM with complications.

Staff at Dioila CSREF had no objections to integrating the training into their regular work and did not receive extra payment; the added value was clear for all involved. While difficult to quantify the extra time required by regular employees, extra staff were recruited by ALIMA at the outset to strengthen CSREF capacity. This was a necessary part of the improvement in in-patient care at the URENI and to ensure trainees were properly managed. In total, 11 ALIMA/AMCP staff were recruited and funding was provided to support 42 workers at the URENI, including six doctors and 20 nurses.

While releasing staff for training was not an issue for doctors and nurses, it was challenging

Figure 1 Trainees' regions of origin



for NFPs who struggled to attend for three whole weeks, the initial length of their supervision training. Training was reduced to two weeks as a result. Interestingly, trainees fed back that even three weeks was too short. There are no practical training programmes for health workers at a lower level; however they can benefit from theoretical trainings provided by the MoH.

There are some significant barriers to full implementation of good practices and standards acquired during the training. The most common ones are the lack of suitable premises and medical equipment (specific tools such as otoscopes, glucometers and saturemeters) and insufficient human resources. Addressing these requires financial and material support from the state; this in turn requires strong advocacy and the involvement of every stakeholder, from NFPs and district head doctors to laboratory and pharmacy managers.

Discussion and conclusions

The URENI training hospital brings together emergency medicine and development, since it both supports children with a high risk of mortality and develops the skills of Malian health workers, thus developing resilience in the health system. The main outcomes of the programme have been to provide a response to structural training needs in the face of the endemic nature of SAM in Mali; to prepare for future nutrition and health crises; and to strengthen capacity to respond to crises in the most challenging regions, particularly in northern Mali, where there are urgent needs. ALIMA has received very positive feedback on the training initiative and no significant changes to the approach are planned.

In the future, the URENI training hospital plans to train health professionals from conflict-affected northern regions (Gao, Timbuktu, Taoudenit, Menaka and Kidal) and central regions (Segou and Mopti) in CSREFs that do not currently receive support from an NGO in

the management of malnutrition. The hospital plans to train eight health professionals per CSREF in these areas who have not yet benefited from the internship. Several grant applications have been submitted to donors to secure finance for the URENI training hospital.

With regard to the long-term goal of improving the treatment of children affected by SAM, we believe it is necessary to implement some complementary programmes, such as training in management of less complicated cases of malnutrition and training on early case identification. There is a real need for improvement of SAM treatment, but we also need to consider ways to reduce the number of children with complicated cases who require hospitalisation.

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References

- 2016 Human Resources Statistical Yearbook of Health, Social Development and the Advancement of Women (February 2017)
- INSTAT 2016. National Statistics Institute of Mali (INSTAT). *Nutrition and retrospective mortality SMART survey, Mali*, July 2016.
- OCHA 2017. United Nations Office for the Coordination of Humanitarian Affairs (OCHA) Financial tracking service (FTS) 2017. <https://fts.unocha.org/>
- UNDP 2016. United Nations Development Programme. Human Development Report – 2016 HDR Report. <http://hdr.undp.org/en/countries/profiles/MLI>
- UNICEF 2016. UNICEF Data. *Monitoring the Situation of Children and Women: Under-five Mortality*. October 2016 (updated). <https://data.unicef.org/topic/child-survival/under-five-mortality/>



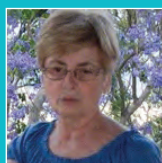
Impact of nutrition education alongside treatment of moderate acute malnutrition in Madagascar

By Paul Sanyas, Brigitte Audras, Margot Magnin and Voahangy Rajaobelina



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This article includes findings of a published study of the programme between 2010 and 2013¹.

Location: Madagascar

What we know: The benefits of including nutrition education in moderate acute malnutrition (MAM) treatment programmes and long-term outcomes for programme beneficiaries are poorly documented.

What this article adds: In 2006, French non-governmental organisation (NGO) APPEL set up a programme in Antananarivo, Madagascar, to treat MAM children under five years of age. It includes treatment (locally produced fortified food) and maternal nutrition education (using a game-based participatory method called Nutricartes®), with a minimum stay (35 days from 2010-2013; 42 days from 2014 onwards) as per Ministry of Health protocol. A published retrospective, longitudinal study evaluated outcomes of 573 children aged 6-59 months enrolled in the MAM treatment programme between 2010 and 2013. During this period, supplementation was provided of 720kcal/d with nutrition education. Children attended an average of 38 days. On discharge, 82.2% had recovered (weight-for-height z score (WHZ) >-2) and 16.2% were mildly malnourished (WHZ <-1 and ≥-2). One year post-discharge, 79.1% remained recovered and 15% had mild malnutrition. Children from homes that chlorinated their water were 1.8 times more likely to have maintained their recovery at one year, compared to households with untreated water. In 2015 and 2016 dietary supplementation was reduced further while sustaining active nutrition education; recovery rates remained high. Findings suggest that a comprehensive MAM programme that includes nutrition education can achieve high short and long-term recovery rates.

Acute malnutrition affects 52 million children below the age of five worldwide (UNICEF, 2012) and is responsible for around 12% of deaths in this age group (Black et al, 2013). The prevalence of acute malnutrition in children below the age of five in Madagascar is 13% (ONN, 2010). In Madagascar and elsewhere malnutrition is often treated by programmes that are principally based on dietary supplements. Although the necessity of including educational and nutrition advice in malnutrition management protocols is often stressed, there is less evidence of the impact of these kinds of interventions. In addition, as the real challenge of a programme to treat malnutrition is to maintain acceptable recovery rates in the long term, there is a lack of information about long-term outcomes for post-programme beneficiaries.

Programme to treat moderate acute malnutrition (MAM)

In 2006, APPEL (www.lappel.org), a French international non-governmental organisation (NGO), set up a programme at the request of the European Union (EU) and the medical branch of the Protestant church on the outskirts of Antananarivo to treat moderate acute malnutrition (MAM) in children under

five years of age. Miray, a Madagascan NGO, runs 15 nutrition rehabilitation outpatient centres for MAM treatment (CRENAM) from the clinic. The staff of four midwives and four nutrition assistants work shifts in teams of two in the CRENAM once per week. Each year the outpatient programme admits around 2,400 malnourished children aged 6-59 months in the lower districts of Antananarivo.

The protocol for treatment of MAM has evolved over the last ten years but has always featured two aspects:

- A treatment component, with a dietary supplement in the form of Koba Aina (an enriched flour of high nutrition quality, made up of 99% local ingredients), which is made in Madagascar.²

¹ Magnin M, Stoll B, Voahangy R and Jeannot E. (2017). Most children who took part in a comprehensive malnutrition programme in Madagascar reached and maintained the recovery threshold. *Acta Paediatr*, 2017. June;106(6):960-966.

² Koba Aina is manufactured in Madagascar by Nutri'zaza, a local company. The product was created by GRET, a French company. It is purchased in bags weighing 20 to 30kg and staff distribute the weekly dose in small packets to the family. It is made of corn flour, Malagasy red rice flour, soy flour, peanuts, sugar, iodised salt, mineral salts and vitamins. Each 100g of the flour contains 360kcal, 10.9g of protein, 8.4g of lipids, 23.3mg of iron and 219mg of calcium, together with zinc and vitamin A.

- An educational component to prevent relapse, involving information, education and counselling (IEC), targeted mainly to mothers. This nutrition education is based on a participatory pedagogical method developed by Nutricartes® (see Box 1).

The acute malnutrition assessment criteria are based on the WHO 2006 weight-for-height Z score (WHZ), in accordance with the Malagasy Ministry of Public Health (MoPH). Nutrition status is graded as recovery (WHZ ≥ -1), mild acute malnutrition (WHZ < -1 and ≥ -2), moderate acute malnutrition (MAM) (WHZ < -2 and ≥ -3) and severe acute malnutrition (SAM) (WHZ < -3). Weekly screening is undertaken by community workers using mid-upper arm circumference (MUAC); MUAC < 115 mm indicates SAM, MUAC ≥ 115 mm < 125 mm indicates

MAM. An evaluation of screened children is then carried out by nutrition assistants who calculate WHZ. Children whose MUAC is < 125 mm but who do not meet WHZ admission criteria are reviewed after one month (there are no MoPH MUAC criteria for admission). Children with complicated SAM (with oedema and lack of appetite) are referred to hospital for in-patient treatment.

MAM children and an accompanying person, usually the mother, are enrolled into a group of about 10–12 children³ for a predefined period of treatment, as required by MoPH protocol (35 days from 2010–13; 42 days from 2014–2017). Children and their accompanying adult attend weekly sessions that last around two hours and include: anthropometric assessment; IEC for the accompanying person; a cooking

Box 2 Published review of nutrition programme in Madagascar (2010–2013)

A retrospective, longitudinal study was undertaken in 2013 to evaluate changes in the nutrition status of moderately malnourished children who took part in the supplementation/nutrition education programme between 2010 and 2013 (see main text for details). The study examined nutrition status (WHZ) on discharge and one year later and change in nutrition status over that period.

Study method

The study used data routinely gathered on programme completion and one year later. As part of the programme, randomly selected children were visited at home one year after discharge for anthropometric assessment and to complete a questionnaire covering personal, socioeconomic, clinical, food and general data. All 622 questionnaires completed between 2010 and 2013 were assessed as part of this study; 573 were included in the final analysis (49 were excluded due to errors, missing data or admission WHZ > -2). Children with uncomplicated SAM who were enrolled on the programme were also included. Children who did not have a four-week minimum stay were excluded.

It was not possible to locate all previously selected children at follow-up; hence they were replaced by other children from the nearest neighbourhood who had previously been enrolled in the programme. The extent of such substitution was not documented. Morbidity data was not reliable enough to include in the analysis.

Results

Study participants were aged between six months and five years on admission, except for one five-month old (0.02%). Average length of stay was 38 days (programme target was 35 days). Most children (94.4%) were admitted with MAM; 5.6% were SAM cases. At the end of the programme, 82.2% of the children met the recovery criteria (WHZ ≥ -1) and 16.2% had improved to mild acute malnutrition (WHZ < -1 and ≥ -2). The recovery rate was higher among children admitted with MAM (83.9%) than those admitted with SAM (53.2%) ($p = 0.0001$). Those with MAM were four times more likely to achieve the recovery threshold than those with SAM, with an odds ratio (OR) of 4.0 and 95% confidence interval (95% CI) of 1.89–8.81.

At one-year follow-up, the global recovery rate was 79.1%; 14.8% were mildly malnourished, 3.5% were moderately malnourished and 1.6% were severely malnourished (see Table 1). Children admitted with MAM were more likely to be recovered at one-year post-discharge than those admitted with SAM (OR 2.6 (95% CI 1.25–5.74), univariate analysis). Children who had recovered at the time of exit were more than twice as likely to maintain that recovery after one year (OR 2.1, 95% CI 1.32–3.54). The recovery rate was statistically higher for children under 24 months old than for children older than 24 months at the end of the programme (OR 1.7, 95% CI 1.11–2.75) and one year after the programme (OR 2.9, 95% CI 1.93–4.59). Children of families that used chlorination to treat water were 1.8 times more likely to have maintained their recovery at one year than households that did not treat their water (OR 1.8, 95% CI 1.12–2.95).

Multivariate analysis confirmed the significant effect of age (OR 2.0, 95% CI 1.23–3.13, $p=0.004$), admission WHZ (OR 4.6, 95% CI 2.08–10.09, $p<0.001$) and gender (OR 2.0, 95% CI 1.29–3.17, $p=0.002$) on the recovery rate at the time of programme exit. The multivariate analysis also demonstrated that age (OR 3.2, 95% CI 2.07–5.04, $p<0.001$), admission WHZ (OR 2.6, 95% CI 1.13–5.96, $p=0.024$) and water treatment (OR 1.2, 95% CI 1.01–1.42, $p=0.031$) significantly influenced nutrition status at one year after the programme, while gender (OR 1.2, 95% CI 0.76–1.86, $p=0.422$) no longer played a significant role. Contrary to the result of the univariate analysis, in the multivariate regression the effect of the exit WHZ (OR 1.7, 95% CI 0.99–2.85) was no longer significant, with a p -value of 0.052.

The 2010–2013 study demonstrated that this comprehensive outpatient MAM treatment programme, which puts a strong emphasis on nutrition education, enabled a good recovery rate (82.2%) that exceeded Sphere Standards (75%) and was sustained one-year post-treatment (79.1%). These results were possible even though the quantity of flour distributed was 30–50% below national recommendations.

Source: Magnin M, Stoll B, Voahang R and Jeanno E. (2017). Most children who took part in a comprehensive malnutrition programme in Madagascar reached and maintained the recovery threshold. *Acta Paediatr*, 2017, June;106(6):960–966.

Box 1 Nutricartes® learning tool

Nutricartes learning tool is made up of two games:

1. A food-based game made up of 150 cards with photos of different foods found in local markets and a game board with four colours: red (growth), yellow (energy), green (protection and micronutrients) and blue (hydration).
2. A health and hygiene game: 24 problem cards (such as dirty water and basic hygiene issues) and 24 solution cards (such as clean water, mosquito net) in the form of pictograms.

Half a day a week for six weeks, a group of 10 to 12 mothers whose children are receiving treatment participate actively in educational sessions on food and hygiene, based on this interactive, play-based and inclusive teaching model. The sessions are led by the nurse-midwife and the nutrition assistant according to the 'Care Groups' principles. This enables the participants to reveal their habits while playing cards, exchange information and share practices, and be encouraged to develop new habits. The sessions end with a cooking demonstration and food tasting. This educational programme is completed with the addition of family-planning advice, support on parenting and vaccination updates for children.

For more information, visit: www.nutricartes.org

demonstration; the on-site consumption of one portion of cooked Koba Aina; and the distribution of Koba Aina for the week ahead. The mother is most often present at the sessions, but sometimes the father comes alone or accompanies his wife. Occasionally, only the grandmother attends with the child. Height is measured at the beginning and end of the treatment programme.

Programme experience and developments

Between 2010 and 2013, the supplementary ration provided 720 kcal per day, compared with the 1,000–1,500 kcal per day recommended by the Malagasy MoPH; official authorisation was granted to lower the daily supplementation dose in favour of providing more nutrition and general education. The education component of the programme was based on Nutricartes® (see Box 1). The children finished the programme once they had reached the recovery threshold of WHZ > -1 and had completed a minimum of four weeks' education. Published findings of a review of the programme for the period 2010 to 2013 are summarised in Box 2.

Post-2013, the programme continued with some modifications, based on the results of the published study. Most significantly, the dietary supplement was reduced to 308 kcal/day for infants aged six to < 12 months and 428 kcal/day for children aged between 12 and 59 months. This supplement was provided for 42 days in accordance with MoPH guidance on minimum stay. On this reduced level of supplementation, combined with the same level of nutrition edu-

³ There were 20 children per group for the first couple of months of the study; this was subsequently reduced.

Table 1 Outcomes on programme completion (42 days) among MAM children and mothers treated in 2015 and 2016

	6-11 months	12-24 months	25-59 months	Breastfeeding mothers (infants < 6 months)
2015				
N	429	1,222	474	250
Recovered	380 (88.5%)	1,101 (90.09%)	390 (82.27%)	250 (100%)
SAM transferred	3 (0.69%)	8 (0.65%)	8 (1.68%)	0
Dropouts	46 (10.7%)	113 (9.24%)	78 (16.4%)	0
2016				
N	464	1,311	474	252
Recovered	441 (95.04%)	1,167 (89.02%)	393 (82.91%)	252
SAM transferred	0	0	0	0
Dropouts	23 (4.91%)	144 (10.9%)	81 (17%)	81 (17%)

cation using Nutricartes®, outcome data since 2014 are comparable to those recorded previously. Analysis of 2016 data finds that 95.04% of children under 12 months, 89.02% of children aged between 12 and 24 months and 82.91% of children over 24 months recover after 42 days of treatment (see Table 1; 2015 data also shown). One-year follow-up data is collected by the programme but is not formally analysed due to limited resources. Internal review of 50-80 cases per year suggests that recovery is sustained, although this is not scientifically proven.

Since 2015, the programme has also treated per year 250 undernourished lactating mothers (MUAC < 210 mm) with an infant under six months old. Some of these infants were likely low birth weight, although birth weight is not usually available to confirm this; none were acutely malnourished. These mothers received five weeks of therapeutic nutrition education and five weeks of the enriched flour (360kcal/day). All infants were exclusively breastfed and received no food supplements. All mothers achieved MUAC > 210mm by the end of the programme; 96.7% of infants had improved nutrition status. One year post-discharge, most infants remained on their normal growth curve or around WHZ -1; a small proportion (3.3%) were between WHZ -1.5 and -2.

Discussion

The results from the 2013 study and subsequent programme experience provide reassurance that sustained recovery is possible using the described approach to MAM treatment. This approach includes nutrition IEC for mothers in small groups using Nutricartes® and advice on preparing balanced meals.

An important factor in achieving and sustaining nutrition recovery is exposure to and management of infectious diseases. While good nutrition of children will not suppress infectious diseases, a nourished child will have greater resistance to infection and will be better able to cope. An additional focus in small groups is therefore basic health and hygiene practices. The Nutricartes® game includes 24 'Hygiene' cards that teach families how to prevent diarrhoea by drinking clean water (with advice on water

chlorination) and how to reduce the risk of malaria through use of mosquito nets. One of the qualitative evaluation criteria for this programme, six months or one year after patient discharge, is the number of diarrhoeal episodes in the month preceding the survey and the number of medical consultations for infections within two to three months preceding the survey. Unreliability of this data has limited morbidity analysis.

Small groups also provide an opportunity to address other household constraints. Nutricartes® includes images such as alcohol, games, telephones and playing cards, which can be helpful in bringing to light financial constraints the family is experiencing and can help facilitate discussion about associated challenges and ideas on where savings can be made. The role of fathers is also important. Programme experience shows that fathers often become a supportive and positive influence in the family as they see their child rapidly recovering from undernutrition and associated illness.

The MoPH has been closely involved and consulted throughout the evolution of this programme. The programme is currently aiming to steadily decrease the amount of enriched flour given per day and the number of days it is administered. Ideally, children would be discharged as soon they have reached the target WHZ, rather than remain for the four-week minimum stay; however the MoPH directive must be complied with for the time being.

While continuing the MAM programme, the next proposed development is an additional approach to provide targeted nutrition education, in groups of 10-12, to mothers of children under two years of age who attend a health centre. This intervention will be provided for a five-week period, irrespective of nutrition status. No food supplementation will be provided. Children will be assessed on admission, on discharge and followed up after one year. We will compare the prevalence of acute malnutrition of these children to those attending another health centre where there is no education component. The hypothesis is that malnutrition can be reduced through nutrition education alone. This research will com-

mence in 2018, pending funding. If successful, the aim is to introduce this method of nutrition education, based on the Nutricartes® tool, across all APPEL healthcare centres, to prevent undernutrition in children. Treatment for undernutrition using this method has also been developed by APPEL in Chad and Burkina Faso.

Conclusion

The context is complex and malnutrition in Madagascar is multifactorial, caused by poverty, poorly adapted nutrition practices and lack of access to clean drinking water. However, findings from the 2013 study show that following a four-week programme of nutrition and general educational sessions based on the Nutricartes® methodology, food supplementation, access to clean drinking water, improved vaccination coverage and parental support, nearly eight out of 10 children recovered from MAM on programme completion and had maintained that recovery one year later.

Routine treatment of MAM in Madagascar is based on daily nutrition support provided through supplementation with fortified food. However, findings from this study show that this approach must also be accompanied by nutrition education for families to reduce recovery time and avoid relapse, while taking family budget constraints into account. A game-based approach has enabled active participation by mothers attending the sessions to achieve this.

Findings of the 2013 study show that high levels of sustained recovery are possible with nutrition education even when the quantity of enriched flour distributed was 30-50% below national recommendations (1,000-1,500kcal/day). High rates of recovery were sustained when this was reduced further to 20-30% supplementation for infants aged six to <12 months and 29-43% supplementation for children aged 12-59 months, although more analysis is needed to confirm the effect one year later. Future pilots will test the efficacy of a nutrition education-only intervention to treat and prevent MAM. Current and future findings may have important cost-benefit implications, given that food supplements are generally the most expensive aspect of MAM programmes.

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References

- Black R, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, et al. *Maternal and child under nutrition and overweight in low-income and middle-income countries*. Lancet 2013; 382: 427-51
- Office National de Nutrition (ONN) (National Nutrition Office). Evaluation du plan national d'actions pour la nutrition (PNAN 2005-2009) (Evaluation of the National Nutrition Action Plan 2005-2009). Antananarivo: ONN, 2010.
- United Nations International Children's Emergency Fund (UNICEF), World Health Organization (WHO) and the World Bank. UNICEF-WHO-World Bank Joint Child Malnutrition Estimates. Levels and trends in child malnutrition. New York, NY: UNICEF; Geneva: WHO; Washington, DC: The World Bank, 2012.

Child height gain is associated with consumption of animal-source foods in livestock-owning households in Western Kenya Research snapshot¹

Animal-source foods (ASF) such as meat, milk and eggs are nutrient-dense and excellent sources of protein, calcium, B vitamins, vitamin A and iron. The use of ASF can promote diversity in the diet of young children, necessary for optimal child growth and development. Household livestock may directly provide ASF for child consumption or provide income with which families can purchase ASF. This paper reports the findings of a study to assess the relationships between the consumption of ASF and child growth and evaluate the household livestock correlates of child consumption of ASF.

The authors conducted a longitudinal cohort study of anthropometry and three-day feeding recall among 874 children under five years old from a 1,800-household catchment area in Western Kenya between June 2014 and May 2015. Data were also collected on wealth, livestock ownership and livestock diseases in the same households. Linear and negative binomial mixed models were used to evaluate the relationships between household livestock characteristics, reported consumption of ASF and child growth. Results were adjusted for predetermined potential confounders, including child age, child sex, number of household members, household

wealth, ownership of other livestock and off-farm income.

Results show that, among children over six months of age, reported frequency of egg and milk consumption was associated with increased monthly height gain (for each additional report of consumption over three days = 0.010 (95% CI 0.002, 0.019) cm/month and 0.008 (95% CI 0.004, 0.013) cm/month, respectively). Poultry ownership was associated with higher reported frequency of egg, milk and chicken consumption (adjusted incidence rate ratio (95% CI)=1.3 (1.2, 1.4), 1.4 (1.1, 1.6) and 1.3 (1.1, 1.4), respectively). Some livestock diseases were associated with lower reported frequency of ASF intake (livestock digestive diseases-adjusted incidence rate ratio (95% CI)=0.89 (0.78, 1.00)).

The authors conclude that child height gain was associated with milk and egg consumption in this cohort and that ASF consumption was related to both household livestock ownership and animal health. Findings suggest that the promotion of egg and milk consumption can support linear growth among children and that both the ownership and health of household livestock can influence child feeding practices.

¹ Mosites E, Aol G, Otiang E, Bigogo G, Munyua P, Montgomery J, Thumbi S. (2017). *Child height gain is associated with consumption of animal-source foods in livestock-owning households in Western Kenya*. Public Health Nutrition, 20(2), 336-345.



WFP/Rose Ogola

Global trends and patterns of commercial milk-based formula sales Research snapshot¹

The marketing of infant/child milk-based formulas (MF) contributes to sub-optimal breast-feeding and adversely affects child and maternal health outcomes globally. However, little is known about recent changes in MF markets. This study describes contemporary trends and patterns of MF sales at global, country and regional levels.

The authors carried out a descriptive study of trends and patterns in MF sales volume per infant/child for the years 2008-2013 and projections to 2018. Data were extracted from the Euromonitor Passport Global Market Information database. Data from 80 countries were available, categorised by World Bank income brackets: 15 lower-middle income countries (LMICs); 6 up-

per-middle income countries (UMICs); and 39 high-income countries (HICs). These data represent 280,220,000 infants and young children aged 0-36 months in 2013. MF categories included total (for ages 0-36 months); infant (0-6 months); follow-up (7-12 months); toddler (13-36 months); and special (0-6 months).

Results of the study show that between 2008 and 2013, world total MF sales grew by 40.8%, from 5.5 to 7.8kg per infant/child/year, a figure predicted to increase to 10.8kg by 2018. Growth was most rapid in East Asia, particularly China, Indonesia, Thailand and Vietnam, and was led by the infant and follow-up formula categories. Sales volume per infant/child was positively associated with country income level, although

there was wide variability between countries.

This indicates that a global, population-level infant and young child feeding (IYCF) transition towards diets higher in MF is not only well underway but is expected to continue, and at a rapid pace in some regions and countries. The observed increase in MF sales raises serious concerns for global child and maternal health, particularly in East Asia, and calls into question the efficacy of current regulatory regimes designed to protect and promote optimal IYCF.

¹ Baker P, Smith J, Salmon L, Friel S, Kent G, Iellamo A, Dadhich JP, Renfrew M (2016). *Global trends and patterns of commercial milk-based formula sales: is an unprecedented infant and young child feeding transition underway?* Public Health Nutrition, 20 (1), pp165-173.

Violations of the International Code of Marketing of Breast-milk Substitutes: Indonesia context

Research snapshot¹

Information and promotional materials produced by breast-milk substitute (BMS) companies and the distribution of free samples of BMS have a well understood detrimental impact on breastfeeding (Shealy et al, 2005; Howard et al, 2000). In 1981, the World Health Assembly (WHA) adopted the International Code of Marketing of BMS ('the Code'), which outlines the minimum international standard to support breastfeeding and to protect mothers from commercial pressure to feed BMS to their babies. In 2010, WHA Resolution 63.23 called on Member States to develop or strengthen legislative, regulatory or other effective measures to control the marketing of BMS to give effect to the Code and relevant subsequent WHA resolutions. In addition, this Resolution also called on manufacturers and distributors to comply fully with their responsibilities under the Code and the WHA resolutions.

The purpose of this study was to measure compliance with the Code in Indonesia, a country which has so far only partially adopted its standards into national legislation. The study took place between November 2012 and

February 2013 in the six provinces on Java island, using the Interagency Group on Breastfeeding Monitoring protocol (IGBM, 2007). A cross-sectional survey was carried out among 874 women (382 pregnant women and 492 breastfeeding mothers of infants below six months) and 77 health workers from 18 participating health facilities. A qualitative analysis was also undertaken of 44 labels of BMS products in three modern stores within a radius of 2 km around each selected health facility, 27 television commercials for nine brands of growing-up milk (for children >12 months) and 34 print advertisements of 14 brands.

The study found that 20% of the women had received advice and information on the use of BMS and 72% had seen promotional materials for BMS. About 15% reported receiving free samples and 16% received gifts. Nearly a quarter of the health workers confirmed receiving visits from representatives of BMS companies. Two health workers reported having received gifts from the companies. The most common labelling violations found were statements or visuals that dis-

couraged breastfeeding and the failure to mention local climate considerations in the expiry date.

This study reveals violations of the Code by health workers, BMS companies and their representatives in all provinces studied. A regular monitoring system is required to ensure improved compliance with and enforcement of the Code in Indonesia.

¹ Hidayana, I., Feburhartanty, J., and Parady, V. (2017). Violations of the International Code of Marketing of Breast-milk Substitutes: Indonesia context. *Public Health Nutrition*, 20(1), 165-173.

References

- Shealy KR, Li R, Benton-Davis S et al. (2005) *The CDC Guide to Breastfeeding Interventions*. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention.
- Howard C, Howard F, Lawrence R et al. (2000) *Office prenatal formula advertising and its effect on breastfeeding patterns*. *Obstet Gynecol* 95, 296-303.
- Interagency Group on Breastfeeding Monitoring (2007) *Monitoring Compliance with The International Code of Marketing of Breast-milk Substitutes: ANNEX III – IGBM Protocol for Estimating the Prevalence of Violations of The Code and National Measures*. London: IGBM.

Factors associated with stunting among pre-school children in Tanzania

Research snapshot¹

Stunting is a major public health problem in Africa, affecting more than one third of children under five years (Black et al, 2013). In Tanzania in 2014, 35% of children under five years of age were stunted, with prevalence reaching 50% in the central and southern highlands zones. The Government of Tanzania, UNICEF and Concern Worldwide are implementing a project to scale up nutrition actions in these regions, with the aim of reducing the prevalence of stunting by 10% over five years. Baseline data were collected in 2013; analysis investigated factors in these regions associated with stunting.

The study was conducted in the regions of Iringa, Njombe and Mbeya, where 4.4 million people live, 72% of them in rural areas. A cross-sectional survey was conducted in each region

using a two-stage cluster sampling design. A total of 63 clusters were selected in each region and 20 households were chosen at random in each cluster. Data were collected using a standardised questionnaire on a digital data gathering (DDG) device via face-to-face interview with the main caregiver of the child. Anthropometric measurements of all children under five years of age were taken. The sample included 1,360 children aged 6-23 months and 1,904 children aged 24-59 months.

The study found that in the younger age group stunting was positively associated with male sex (adjusted odds ratio (AOR): 2.17; confidence interval (CI): 1.52-3.09) and maternal absence (AOR: 1.93; CI: 1.21-3.07) and negatively associated with household diet diversity (AOR: 0.61; CI: 0.41-0.92). Among older children, stunting was positively associated with male sex

(AOR: 1.28; CI: 1.00-1.64) and having a mother currently breastfeeding (AOR: 1.97; CI: 1.18-3.29) and negatively associated with being age four and five years (AOR: 0.71; CI: 0.54-0.95; AOR: 0.60; CI: 0.44-0.83); access to improved water source (AOR: 0.70; CI: 0.52-0.93); and access to a functioning water station (AOR: 0.63; CI: 0.40-0.98).

Findings show that male children are more at risk of stunting than female children, with risk peaking in the second and third year of life. Furthermore, the nutritional status of a child is directly related to maternal presence and maternal reproductive status. Younger children are particularly affected by maternal absence, while older children are affected by their mother breastfeeding a younger sibling. The authors conclude that interventions that increase household wealth and improve water and sanitation conditions should be implemented to reduce stunting. Furthermore, family planning activities and programmes to support mothers during pregnancy and lactation can have positive effects both on the newborn and older siblings.

¹ Altare C, Delbiso TD, Mutwiri GM, Kopplow R and Guha-Sapir D. (2016). Factors associated with stunting among pre-school children in southern highlands of Tanzania. *J Trop Pediatr*. 2016 Oct; 62 (5): 390-408.

References

- Black R, Victora CG, Walker SP, et al. *Maternal and child undernutrition and overweight in low-income and middle-income countries* [Internet]. *Lancet* 2013;382: 427-51. [www.thelancet.com/journals/a/article/PIIS0140-6736\(13\)60937-X/fulltext](http://www.thelancet.com/journals/a/article/PIIS0140-6736(13)60937-X/fulltext) (25 May 2014, date last accessed).



Kigoma, Tanzania, 2015

Role of intestinal dysfunction in the nutritional compromise seen in human immunodeficiency virus-infected adults in rural India

Research snapshot¹

Human immunodeficiency virus (HIV) disease progression is often marked by enteropathy, which contributes to malabsorption of macro- and micro-nutrients and to progressive weight loss. Altered intestinal function may also lead to poor absorption of antiretroviral and anti-tuberculosis drugs, resulting in treatment failure. Little is known about the magnitude of intestinal dysfunction in the HIV-infected population, particularly in resource-poor countries such as India. This study investigated the association of intestinal dysfunction in HIV-infected individuals with nutritional status and low serum/plasma levels of antioxidant micronutrients, comparing levels with healthy seronegative controls in a rural population in India.

The study was carried out in 2006 in Tamil Nadu. The target population is mainly agrarian, with many being subsistence farmers and labourers. A cross-sectional survey was conducted among 45 consenting HIV-infected, antiretroviral therapy (ART) naive participants attending an HIV clinic and 45 age and socioeconomic matched HIV-negative, neighbourhood population controls. The extent of intestinal dysfunction

was assessed using a D-xylose absorption test and association with nutritional compromise was measured by body mass index (BMI) and serum antioxidant levels.

Results found that a similar proportion of HIV-positive and HIV-negative participants had intestinal dysfunction (42.2% versus 44.4%) that was worse with advanced disease; an increasing gradient of low D-xylose absorption was noted with decreasing CD4 counts (32%, 50% and 58.3% among those with >350, 200-350 and <200 cells/mm³, respectively). Multivariate analysis revealed a significant association between intestinal dysfunction and low BMI ($P=0.03$) independent of HIV infection and calorie intake per day ($P=0.02$).

The findings suggest an underlying prevalence of enteropathy among the rural population in India which makes the HIV-positive population more vulnerable to nutritional compromise and rapid progression of disease. The authors conclude that weight loss in HIV-infected individuals should be investigated for intestinal dysfunction, especially in low-resource settings, to aid appropriate management.



¹ Isaac R, Paul B, Geethanajali FS, Kang G, Wanke C. (2017). Role of intestinal dysfunction in the nutritional compromise seen in human immunodeficiency virus-infected adults in rural India. *Tropical Doctor*, Vol.47 (1) 44-48.

A qualitative study of the root causes of undernutrition in Nairobi slums

Research snapshot¹

Children in slums are at high risk of undernutrition, which has long-term negative consequences on their physical growth and cognitive development and increases their risk of mortality. This study provides an analysis of the causes of undernutrition in children as perceived by community members in two slums in Nairobi, Kenya. The data used in the study were collected for a formative study in April 2012 that aimed to understand infant and young child feeding (IYCF) practices to inform a subsequent intervention. The present

paper draws on this analysis of ten focus group discussions (FGDs) and ten individual interviews (KIIs) conducted with women of childbearing age, community health workers, community elders, community leaders and other knowledgeable people in the two slum communities.

Questions included perceptions of the nutritional status of infants living in the local community; knowledge, attitudes and practices with regard to maternal, infant and young child nutrition; and nutritional status of children in urban slums. Questions focused on the contextual

and sociocultural norms that influence IYCF practices. The FGDs and KIIs were recorded and transcribed verbatim. Key concepts were drawn out to enable thematic analysis.

A total of 90 individuals participated in FGDs ($n=80$) and KIIs ($n=10$). The analysis shows that participants understand the linkages between root causes and child nutritional health as expressed in the UNICEF conceptual framework. The respondents' narratives strongly linked infant and child undernutrition and inadequate dietary intake, household food insecurity, inappropriate care and feeding practices. Identified risk factors included: water, sanitation and hygiene (WASH) practices, family planning, maternal work, parents' alcohol abuse and consumption of street foods.

The authors conclude that to tackle the immediate and underlying causes of undernutrition in slum communities, interventions should aim to: (i) improve maternal health and nutrition; (ii) promote optimal IYCF practices; (iii) support mothers in their working role; (iv) increase access to family planning; (v) improve WASH; (vi) address alcohol problems at all levels; and (vii) address street food issues with infant feeding counselling.

¹ Goudet S, Kimani-Murage E, Wekesah F, Wanjohi M, Griffiths P, Bogin B and Madise N. (2017). How does poverty affect children's nutritional status in Nairobi slums? A qualitative study of the root causes of undernutrition. *Public Health Nutrition*, 20(4), 608-619.



Nairobi slum

Famine fears in northeast Nigeria as Boko Haram fight rages

Research snapshot¹

A recent report in *The Lancet* describes the situation in northeast Nigeria where, amid continued fighting, over five million people are now going hungry. The prevalence of severe acute malnutrition (SAM) in July 2016 in internally displaced people (IDP) in one area was 20%, which is five times the emergency threshold. Rapid field screenings of children found levels as high as 40%. UNICEF has warned that 75,000 children could face starvation this year without aid. Although food distributions have scaled up substantially, 400,000 to 800,000 people remain cut off from help. Even in accessible areas, millions are expected to face severe food shortages this year, according to the Famine Early Warning Systems Network (FEWSNET), due to disruptions from the conflict, which have stopped farmers

planting crops, displaced large populations, cut off transport, disrupted markets and driven the cost of staple food out of many people's reach. Analysts expect high rates of malnutrition and mortality among these populations as well as a high probability of outbreaks of diseases such as measles, meningitis, diphtheria and pertussis.

The Nigerian Government has denied the severity of the hunger crisis. It has also been difficult to get donor countries to fund relief efforts. Last year, the United Nations (UN) received only about half of its US\$480 million appeal for the region. "It took some time to convince the donors that the Nigerian Government could not handle it on their own", said Toby Lanzer, the UN's Regional Humanitarian Coordinator for the Sahel. The food crisis has in fact been

going on for several years, but little aid was provided until recently because areas have been largely cut off due to military operations. This meant that humanitarian agencies did not fully understand the scale of the problem and even when they began to, they still could not access most of the affected areas. "There has been a real lack of political will to acknowledge the scale of the problem," said Natalie Roberts, who managed the Médecins Sans Frontières (MSF) emergency operations in the region. "It is very easy now for everybody to scale up their aid and pretend that nothing happened before."

¹ Loewenberg S. (2017) World report: *Famine fears in northeast Nigeria as Boko Haram fight rages*. *The Lancet*, Vol. 389, January 28, 2017.

Pros and cons of cost-effectiveness thresholds

Research snapshot¹

Cost-effectiveness analysis is used to compare the costs and outcomes of alternative policy options. Each resulting cost-effectiveness ratio represents the magnitude of additional health gained per additional unit of resources spent. Many countries use cost-effectiveness analyses and cost-effectiveness ratios to guide their decisions on resource allocation and to compare the efficiencies of alternative health interventions. In 2001, the World Health Organisation (WHO) Commission on Macroeconomics in Health suggested cost-effectiveness thresholds based on multiples of a country's per-capita gross domestic product (GDP). The Commission suggested that it is reasonable to spend the estimated

value of a year of healthy life, per capita, on an intervention that led to a mean of at least one additional year of healthy life per capita. In some contexts, in choosing which health interventions to fund and which not to fund, this and other more recent thresholds based on GDP have been used as decision rules.

However, experience with the use of such GDP-based thresholds in decision-making processes at country level shows them to lack country specificity. In addition, economic models that are often used to generate cost-effectiveness ratios can be inaccurate. This can lead to wrong decisions being made on how to spend healthcare resources. Cost-effectiveness information should be used alongside other considerations, such as

budget impact and feasibility, in a transparent decision-making process, rather than in isolation based on a single threshold value. Although cost-effectiveness ratios are undoubtedly informative in assessing value for money, countries should be encouraged to develop a context-specific process for decision-making that is supported by legislation, has stakeholder buy-in (for example, the involvement of civil society organisations and patient groups) and is transparent, consistent and fair.

¹ Bertram MY, Lauer JA, De Joncheere KD, Edejer T, Hutubessy R, Kieny MP and Hill SR. (2016) Cost-effectiveness thresholds: pros and cons. *Bull World Health Organ* 2016;94:925–930. <http://dx.doi.org/10.2471/BLT.15.164418926>

Refugee crisis presents a human paradox

Research snapshot¹

The United Nations High Commissioner for Refugees (UNHCR) estimates that 65 million people in the world today have been displaced by violence or armed conflict. UNICEF estimates that 28 million of these people are children. Half of all displaced people come from just three countries: Syria, Afghanistan and Somalia. Given this, representatives of states, United Nations (UN) agencies, non-governmental organisations (NGOs) and others met at the UN Summit on Addressing Large Movements of Refugees and Migrants in New York on 19 September 2016 and the New York declaration for migrants and refugees was adopted. The declaration's commitments aim to tackle immediate needs of refugees and provide long-term solutions; pledging, for example, to "protect the human rights of all refugees" and

"improve the delivery of humanitarian and development assistance".

Improving humanitarian aid is amenable to a rational, scientific approach: working out what specific aid is required (food, shelter, clean water, medicine) and providing the funding and infrastructure to deliver it quickly and safely. However, there is a paradox for healthcare providers whose efforts will always exacerbate the more complex problem of refugees: the better the services are in a camp, the more people it attracts, reducing the pressure on other states to accept refugees for longer-term resettlement. The solution becomes part of the problem.

The author reflects how humanitarians can become the mechanism by which the mass containment of people is undertaken and justified

at the expense of their human rights. It is important to openly question practices and insist that more is done to reduce physical and psychological trauma of refugees, while always remembering that medicine and humanitarian aid can also contribute to longer-term problems for people who do not simply have "needs" in order to stay alive, but ambitions to live fully. Van Tulleken suggests that humanitarians must be conformists abroad, knuckling down in the troubled countries where they work, but at home they can and should agitate for change, lobbying governments to accommodate those in greatest need and finding new ways of giving care and advocating on their behalf.

¹ van Tulleken, A. (2016). *Refugee crisis presents a humanitarian paradox*. *BMJ* 2016;355:i5412

The link between tuberculosis and undernutrition

Research snapshot¹

Undernutrition increases the frequency, severity and fatality of many infections, including tuberculosis (TB), while infections, in turn, worsen undernutrition. Undernutrition in adults is an under-recognised driver of TB epidemics. Large studies have consistently shown a strong, inverse and exponential relationship between body mass index (BMI) and incidence of TB (Lönnroth et al, 2010). Undernutrition contributes most to incidence of TB in high-burden countries with a lower HIV prevalence, such as those in Southeast Asia. Around 55% of the annual incidence of TB (more than one million new cases) in India is attributable to undernutrition (Bhargava, 2014); modelling suggests that reducing adult undernutrition could cut new cases by up to 71% in certain states (Oxlade, 2015).

Undernutrition is a widely prevalent comorbidity in people with TB and increases the risk of more severe disease, death, malabsorption of anti-TB drugs and relapse after cure. The recent World

Health Organisation (WHO) guideline made recommendations for nutrition support in patients with TB, for action (WHO, 2013). WHO's End TB strategy aims to reduce the incidence of TB by 90% by 2035. One third of the world's population are estimated to have latent TB infection, but with well functioning, cell-mediated immunity, only 5-15% will develop active TB over a lifetime. To meet the ambitious WHO target, undernutrition must be tackled, as well as other risk factors for progression from latency to active disease.

In German prisoner of war camps during the Second World War, British soldiers given a Red Cross ration of 1,000 calories and 30g protein in addition to the poor camp diet had a 93% lower incidence of TB than their Russian counterparts, who received no ration – a risk reduction comparable to that of an effective vaccine. The new vision of TB control should also focus on the measurable, preventable and reversible co-epidemic of undernutrition.

References

- Lönnroth, K., Williams, B.G., Cegielski, P., Dye, C. (2010). A consistent loglinear relationship between tuberculosis incidence and body mass index. *Int J Epidemiol* 2010;39:149-55. doi:10. 1093/ije/dyp308pmid:19820104.
- Bhargava, A., Benedetti, A., Oxlade, O., Pai, M., Menzies, D. (2014) Undernutrition and the incidence of tuberculosis in India: national and subnational estimates of the population-attributable fraction related to undernutrition. *Natl Med J India* 2014;27:128-33. pmid:25668081.
- Oxlade, O., Huang, C.C., Murray, M. (2015) Estimating the impact of reducing under-nutrition on the tuberculosis epidemic in the central eastern states of India: a dynamic modelling study. *PLoSOne* 2015;10:e0128187. doi:10.1371/journal.pone.0128187pmid:26046649.
- World Health Organization. (2013) Guideline: nutritional care and support for patients with tuberculosis. WHO, 2013.

¹ Bhargava A. (2016). *Undernutrition, nutritionally acquired immunodeficiency, and tuberculosis control*. British Medical Journal, December 2016, Vol. 2.

The impact of Ethiopia's Productive Safety Net Programme on the nutritional status of children

Research snapshot¹

Ethiopia's Productive Safety Net Programme (PSNP) is a large-scale, social protection intervention aimed at improving food security and stabilising asset levels. The PSNP contains a mix of public works, employment and unconditional cash and food transfers. It uses a mix of geographic and community-based information to identify chronically food-insecure households in chronically food-insecure woredas²; evidence suggests the programme targets well. There were difficulties in making timely and predictable payments to beneficiaries in the first five years of the programme; however since 2010 performance has

significantly improved. There is evidence that the PSNP has been successful in improving household food security; however children's nutritional status in the localities where the PSNP operates remains poor, with 48% of children stunted in 2012. This prompts the question whether the PSNP can improve child nutrition.

This paper examines the impact of the PSNP on children's nutritional status from 2008 to 2012. The paper draws on four rounds of data from a longitudinal survey of PSNP beneficiaries and non-beneficiaries from 68 randomly selected woredas. Interviews with sample households were undertaken in 2006 (n=3,680), 2008

(n=4,690), 2010 (n=4,654) and 2012 (n=5,092). Information was collected on household demographic composition, assets, agriculture, non-agricultural income-generating activities, consumption, food security, and shocks; anthropometric information was collected in all years apart from 2006.

Based on an analysis using inverse-probability-weighted regression-adjustment estimators, no evidence was found that the PSNP reduced either stunting (height-for-age z-scores) or wasting (weight-for-height z-scores). The reason for this cannot be definitively identified; however the authors note evidence that child diet quality was poor, with no improvement found in child consumption of pulses, oils, fruits, vegetables, dairy products or animal-source proteins during the study period. Most mothers had no contact with health extension workers; nor had they received information on good feeding practices. Water hygiene practices, as captured by the likelihood that mothers boil drinking water, were also found to be poor. Along with work by other researchers, these findings have informed revisions to the PSNP. Future research will assess whether these revisions have led to improvements in the diets and anthropometric status of pre-school children in Ethiopia.

¹ Berhane G, Hoddinott J and Kumar N. (2017) *The impact of Ethiopia's Productive Safety Net Programme on the nutritional status of children: 2008-2012*. Ethiopia Strategy Support Programme (ESSP) Working Paper 99, EDRI and IFPRI.

² Woredas or districts are the third tier of Ethiopian administrative division.

WFP/Michael Tewelde



Preventing and treating growth faltering in Maya children

Research snapshot¹

The Maya people are descended from the indigenous inhabitants of southern Mexico, Guatemala and adjacent regions of Central America. In Guatemala, 50% of infants and children are stunted (very low height-for-age) and some rural Maya regions have >70% children stunted. A large, longitudinal, intergenerational database

was created that included data from three sources. This report presents brief descriptions of the data and explains how they may serve to improve healthy birth, growth and development globally.

The first source is the Universidad del Valle de Guatemala (UVG) study, a large, mixed-longitudinal study of human growth in Latin America that contains 138,000 cross-sectional sets of data (girls and boys aged four to 18 years). Between 1953 and 1999, children were assessed annually for height, weight, skinfolds, upper-arm circumference, permanent teeth erupted, hand-grip strength, general cognitive ability and reading performance, and a hand-and-wrist radiograph was taken. These data may help determine the most sensitive chronological ages and maturational stages for risks of stunting and neuro-cognitive impairment.

The second source is a set of child growth and intergenerational studies among the Maya in Mexico, performed over decades. This has resulted in many published papers, highlighting the development of the nutritional dual-burden phenomenon (coexistence of stunting with over-

weight/ obesity) and the impact of maternal grandmother's childhood health status on fat accumulation in grandchildren. Further analysis may highlight relative contributions of the mother and grandmother on linear and mass growth of children.

The third dataset is from studies conducted since 1992 with Maya migrants in Los Angeles and Florida. Children had a marked increase in average height (11cm) and reduction in stunting. Most of these children were born in the United States and had access to clean drinking water, pre- and post-natal health care, food subsidies and a general positive environment, despite low socioeconomic status. The change in average height occurred in less than ten years but was accompanied by a marked rise in overweight/obesity. The sharing of these data may enable robust analyses to determine the interactions of pathophysiological causal pathways and genetic, epigenetic, environmental, social and demographic factors that directly affect the sensitivity, severity and duration of growth faltering and impaired neurocognitive development.

¹ Varela-Silval MI, Bogin B, Sobral JA, Dickinson F and Monserrat-Revillo S. (2016). *Deep data science to prevent and treat growth faltering in Maya children*. European Journal of Clinical Nutrition (2016) 70, 679–680.



Guatemala, 2012

WFP/Francisco Fion

A small-quantity, lipid-based nutrient supplement to reduce anaemia and stunting among refugees in the Horn of Africa

Research snapshot¹

Stunting and micronutrient malnutrition are persistent public health problems in refugee populations. As one approach to address these issues, UNHCR and its partner organisations implement blanket supplementary feeding programmes. The evidence base for the efficacy and effectiveness of a small quantity of lipid-based nutrient supplement (LNS), Nutributter®, in reducing stunting and anaemia is limited.

Secondary data analysis was used to assess the effectiveness of Nutributter® distribution on anaemia and stunting in children aged 6-23 months (the programme target group) and 6-59 months (the standard age group sampled in routine nutrition surveys). Analysis was conducted using routine pre- and post-intervention cross-sectional nutrition survey data collected between 2008 and 2011 in five refugee camps in Kenya and Djibouti. Changes in total anaemia (haemoglobin <110g/L), anaemia categories (mild, moderate and severe) and stunting (height-for-age z-score <-2) were explored using available data on the Nutributter® programme and other camp nutrition and health surveillance data.

Results show a significant reduction in the prevalence of anaemia in children aged 6-23 months and 6-59 months in four of five camps and in all five camps, respectively ($p < 0.05$). Reductions ranged from 12.4 to 23.0% and 18.3 to 29.3% in each age group. Improvements were largely due to reductions in moderate and severe anaemia and occurred where the prevalence of acute malnutrition was stable or increasing. No change in stunting was observed in four of five camps (stunting decreased significantly between baseline and end-line in Dadaab-Hagadera camp only). The replicability of findings across five sites strongly suggests that Nutributter® distribution was associated with a reduction in anaemia but not stunting among refugee children in the Horn of Africa. Benefits were not restricted to the 6-23 months old group targeted by the nutrition programme. However, anaemia remained a serious public health problem even after this intervention and additional work to define and evaluate an effective intervention package is warranted.

¹ Style S, Tondeur M, Grijalva-Eternod C, Pringle J, Kassim I, Wilkinson C, et al. (2017) *Assessment of the effectiveness of a small quantity lipid-based nutrient supplement on reducing anaemia and stunting in refugee populations in the Horn of Africa: Secondary data analysis*. PLoS ONE 12(6): e0177556. <https://doi.org/10.1371/journal.pone.0177556>

WFP/Stephanie Savariaud



Daddab Refugee Camp, Kenya

AJFAND special issue on biofortification

Summary of research¹

Over the last decade HarvestPlus CGIAR² national partners have developed over 150 varieties of 11 micronutrient-rich staples, including rice, wheat, maize, sweet potato, beans, cassava and pearl millet. Around 15 million people are growing and consuming these nutrient-rich varieties; over 80% of them are in Africa. The African Journal of Food, Agriculture, Nutrition and Development (AJFAND) recently published a special issue on biofortification to capture some of these experiences. The issue compiles existing evidence on biofortification, identifies knowledge gaps and discusses how to leverage biofortification to improve nutrition and health, especially in Africa. It includes articles by practitioners that assess delivery experience of biofortified crops across several countries and through various delivery channels.

The issue comprises a series of articles that present:

- An overview of the landscape and approach for biofortification in Africa;
- The effect of provitamin A biofortified staple crops on vitamin A status, the efficacy of iron-biofortified crops, and micronutrient (provitamin A and iron/zinc) retention in biofortified crops;
- Progress made by HarvestPlus in plant breeding and instrumentation, including crop development, biovarieties that have been released and high-throughput measurement methodologies for developing nutrient-dense crops;
- The experiences of crop development and delivery in Africa, including sweet potato in Sub-Saharan Africa, orange maize in Zambia, vitamin A-rich cassava in Nigeria

and iron-rich beans in Rwanda;

- Insights into the marketing of biofortified crops and integrating the crops in community development programmes;
- Measurement and maximisation of the impact of biofortification programmes, identifying optimal investments in biofortification and evidence of the effectiveness of the orange sweet potato;
- A section on policy and stakeholder engagement describing advocacy experiences in biofortification; and
- A summary of the way forward for biofortification.

Three of the articles are summarised below. All articles can be accessed in full at:

<https://www.ajfand.net/Volume17/No2/index.html>

An overview of biofortification in Africa

Research snapshot³

Biofortification is the process of breeding nutrients into staple food crops to help reduce mineral and vitamin deficiencies. It is recognised by the Scaling up Nutrition (SUN) Movement as an important link in the chain between agriculture and nutrition. It offers a cost-effective and sustainable investment as, unlike the ongoing financial outlays required for supplementation and commercial fortification programmes, a one-time investment in plant breeding can yield micronutrient-rich planting materials for farmers to grow for years to come.

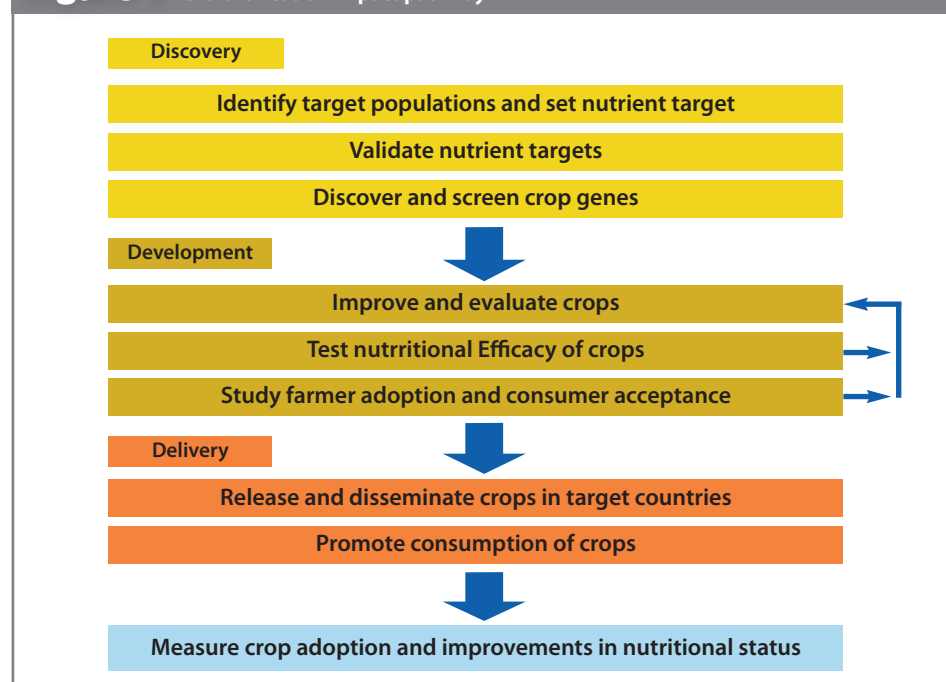
There are three common approaches to biofortification: agronomic, conventional and transgenic. Agronomic biofortification provides temporary micronutrient increases through fertilizers and/or foliar sprays and is useful to increase micronutrients absorbed directly by the plant. Conventional plant breeding involves identifying and developing parent lines with naturally high vitamin or mineral levels and crossing them over several generations to produce plants with desired nutrient and agronomic traits. Transgenic plant breeding seeks to do the same in crops

where the target nutrient does not naturally exist by inserting genes from another species. The special issue of AJFAND focuses on conventionally bred, biofortified varieties of staple food crops as currently little evidence exists on the use of agronomic biofortification and transgenic biofortified crops in Africa.

A three-stage process takes biofortification strategies from research to delivery (see Figure 1). Methodologies have been developed over the years to calculate the levels of extra minerals and/or vitamins required in diets to have a measurable public health impact. Resulting nutrient targets are used by economists and nutritionists to calculate the cost-effectiveness of biofortification strategies. This then guides donor investments in the development and testing of biofortified staple food crop varieties (calculation methodologies are described in detail in the AJFAND edition).

Since 2012, biofortification has moved significantly into the delivery phase in several African countries; several case studies are written up in this special issue. With strong proof-of-concept for biofortification, moving towards scale will require increased public and private sector investment in crop development and seed systems to sustain the pipeline of biofortified varieties.

Figure 1 Biofortification impact pathway



¹ Special issue devoted to biofortification. The African Journal of Food, Agriculture, Nutrition and Development (AJFAND), Vol. 17, no. 2 (2017).

² Formerly the Consultative Group for International Agricultural Research.

³ Bouis H, Saltzman A, Low J, Ball A and Covic N. (2017) An overview of the landscape and approach for biofortification in Africa. African Journal of Food, Agriculture, Nutrition and Development, Vol. 17, No. 2, April 2017. <https://www.ajfand.net/Volume17/No2/index.html>

Development and delivery of orange sweet potato in Sub-Saharan Africa

Research snapshot⁴

In sub-Saharan Africa (SSA), more than 40% of children under five years old suffer from vitamin A deficiency. One intervention to tackle this problem is the breeding



Sweet potato and cassava crops, Andahive, Madagascar

WFP/Riana Ravoala

of vitamin A or beta-carotene (the precursor to vitamin A) into staple crops. The orange sweet potato (OSP) is one such crop that is now used in three million households across SSA. Key to the successful uptake of OSP is that it is liked by target consumers, even in the absence of information about its nutrition benefits. Factors that increase the likelihood of farmers adopting OSP include building an 'orange brand' around it; availability of vines to plant; women having influence/control over land; and access to markets. Rates of adoption are increased in households that have regularly consumed white sweet potato in the past. Rapid breeding of OSP varieties was made possible in part by the fact that high levels of beta-carotene exist naturally in many varieties.

Evidence from Mozambique and Uganda shows that an integrated intervention including agriculture (low-cost provision of easy-to-grow OSP), nutrition (broad education and awareness of benefits and use of OSP) and marketing (op-

portunities to commercialise surplus OSP) positively impacts child vitamin A intakes. The use of OSP in enhanced homestead food production (EHFP) that promotes year-round, nutrition-sensitive agriculture and good nutrition with hygiene practices has also shown positive results in Burkina Faso and Côte d'Ivoire, including reduced levels of anaemia.⁵ The use of OSP in the Mozambique emergency response (drought 2009/2010 followed by floods 2011/2012) was also effective; in just two years a USAID-funded disaster mitigation project, in collaboration with government extension services, reached 134,919 households with new, drought-tolerant varieties of OSP.

The Sweet Potato Profit and Health Initiative (SPHI), launched in 2009, aims to improve the lives of 10 million African households in 17 SSA countries by 2020 through access to OSP. The SPHI has provided an important mechanism for stakeholder engagement so far and continues to play a vital role. Efforts are being intensified to support mainstreaming of OSP into government agriculture and nutrition programmes and to integrate OSP nutrition education into educational institutions to ensure permanent behaviour change.

Optimal investments in biofortification

Research snapshot⁵

As momentum for biofortification builds and stakeholders become increasingly interested in investing in it, evidence-based information is needed to decide how and where to target biofortified crops to impact nutrition most cost-effectively. To this end, HarvestPlus has developed the Biofortification Prioritisation Index (BPI), which ranks countries according to their suitability for investment in biofortification interventions. The BPI is a geometric mean of three sub-indices based on country-level crop production and consumption data from the Food and Agriculture Organization (FAO) and country-level iron, zinc and vitamin A deficiency data from the World Health Organization (WHO). Several sub-indices are used: the production sub-index captures the extent to which a country is a producer of one of the staple crops targeted by HarvestPlus for biofortification; the consumption sub-index captures the proportion of the crop under domestic production consumed by the country's population; and the micronutrient sub-index captures the extent to which a country's population suffers from the respective micronutrient deficiency (vitamin A, zinc or iron). The combined number of the three sub-indices is rescaled into a score ranging from 0 to 100, where 0 indicates low priority and 100 indicates a high-priority country for consideration of a biofortification intervention. For example, Brazil is ranked 11 among the 81 countries that produce beans out of the 127 countries in the database and is therefore a

good candidate for biofortification investment in iron beans, but is ranked 58 among the 75 sweet-potato producing countries and is therefore deemed low priority for investment in vitamin A sweet potato biofortification.

Micronutrient intervention portfolio studies offer the ability to distinguish production, consumption and inadequate micronutrient intake at a more disaggregated level. These studies offer a complementary design and planning tool to simulate the implementation of biofortification and examine its potential impact and cost-effectiveness among different approaches. The studies are also designed to examine multiple interventions in a country to better understand biofortification's role in reducing micronutrient deficiency when considered among a suite of interventions. This paper provides a case study of Zambia, which is ranked third highest on the BPI for suitability to invest in vitamin A maize due to its high production and per capita consumption and high prevalence of vitamin A deficiency. The case study demonstrates how these tools can be used to assess the potential impact of biofortification, quantify its cost-effectiveness and examine how it interacts with and complements other interventions. Given the long-term nature of biofortification as an intervention investment, future analyses should incorporate various scenarios, including continued investment in sustainable development and the effects of climate change, which are likely to condition the impact of biofortification and other interventions.

WFP/Jonathan Biles



Sweet potato crop, Swaziland

⁴ Low J, Ball A, Magezi S, Njoku J, Mwanga R, Andrade M, Tomlins K, Dove R and van Mourik T. (2017). Sweet potato development and delivery in sub-Saharan Africa. *African Journal of Food, Agriculture, Nutrition and Development*, Vol. 17, No. 2, April 2017. <https://www.ajfand.net/Volume17/No2/index.html>

⁵ OSP is relatively low in phytate compared to other cereals and has high ascorbic acid and fructose, which may improve iron availability.

⁶ Lividini K, Fiedler JL, Zeller M, Asare-Marfo D, Funes J and Birolli E. (2017) Identification of optimal investments. *African Journal of Food, Agriculture, Nutrition and Development*, Vol. 17, No. 2, April 2017. <https://www.ajfand.net/Volume17/No2/index.html>



Does economic growth reduce childhood undernutrition in Ethiopia?

Summary of research¹

Location: *Ethiopia*

What we know: Rapid economic growth in developing countries has had a mixed effect on human development; the impact on reducing childhood undernutrition is not well understood.

What this article adds: A cross-sectional study of three rounds of data from the Demographic and Health Survey (DHS) in Ethiopia (2000, 2005 and 2010) was integrated with corresponding World Bank real per capital income (PCI) to examine the association between economic growth and childhood undernutrition in Ethiopia. Household PCI improved in the two sample period intervals by 18.85% and 43.14% respectively. Strong significant associations were found between PCI and child undernutrition, as measured by stunting, underweight and wasting ($P < 0.0001$ for all measures) in 32,610 children aged 0 to 59 months. Results suggest a strong correlation between economic development and improved anthropometric nutritional status in Ethiopia.

Policy discussions and debates over the last couple of decades have emphasised the efficiency of development policies in terms of translating economic growth into human development. However, the literature shows that rapid economic growth has brought mixed results and the effect of economic growth on improving human nutrition remains inconclusive. In some countries, rapid economic growth has accompanied increased income inequality, while in others it has brought little or no substantial improvement in poverty and nutrition outcomes (DNEAP, 2010; O'Donnella et al, 2009).

For the past decade, Ethiopia has made economic progress, with a gross domestic product (GDP) growth rate of 11% per annum. Despite this achievement, the prevalence of micronutrient deficiencies remains high and infant and young child feeding practices remain sub-optimal. This study aimed to assess the interplay between economic growth and childhood undernutrition in Ethiopia.

Three rounds of cross-sectional data from the Ethiopian Demographic and Health Survey (DHS) (2000, 2005 and 2010) were used for the study. DHS involves multi-stage cluster sampling and collects standardised data from women of reproductive age regarding their socio-demographic characteristics and maternal and child health. Child nutritional status is assessed using standard anthropometric measures. A multi-level, mixed logistic regression model was used for analysis. The dependent variables were stunting, underweight and wasting in household children. The main independent variable was World Bank real per

capita income (PCI) that was adjusted for purchasing power parity.

A total of 32,610 children aged 0 to 59 months was included in the pooled analysis, with 11,095 (34.02%); 9,861 (30.24%); and 11,654 (35.74%) samples from the 2000, 2005 and 2010 surveys respectively. Overall, 11,296 children (46.7%) [46.0%-47.3%] were stunted, 8,197 (33.8%) [33.2%-34.4%] were underweight and 3,175 (13.1%) [12.7%-13.5%] were wasted². Among respondents, 84.4% lived in rural areas, 83.9% were male-headed households, 89.9% were married, and 24.8% were in the lowest wealth quantile at the time of the survey. More than 15.1% of families used unimproved toilet facilities, 45.6% received improved water, 53.3% of respondents did not engage in paid work, while 22.1% (7,130) and 76.6% (24,673) of husbands were employed in paid jobs and agricultural activities respectively. The relevant PCI of the country data (2000: US\$515, 2005: US\$612 and 2010: US\$876) demonstrated an improvement in PCI of households in Ethiopia in the two sample period intervals of 18.85% and 43.14%, respectively.

Analysis showed a strong correlation between prevalence of early childhood undernutrition outcomes and PCI. The proportions of stunting ($r = -0.1207$, $p < 0.0001$), wasting ($r = -0.0338$, $p < 0.0001$) and underweight ($r = -0.1035$, $p < 0.0001$) from all children in the household were negatively correlated with the PCI. In the final model adjustment with all the covariates, economic growth was associated with a substantial reduction in the prevalence of stunting [$\beta = -0.0016$, $SE = 0.00013$, $p < 0.0001$], underweight [$\beta = -0.0014$, $SE = 0.0002$, $p < 0.0001$]

and wasting [$\beta = -0.0008$, $SE = 0.0002$, $p < 0.0001$] in the country over a decade. Results demonstrate that economic growth was strongly (negatively) correlated with undernutrition in Ethiopia. This confirms the hypothesis that economic development is associated with improved nutritional status as measured by prevalence of underweight, wasted and stunted children.

These results contribute to empirical findings that confirm the association of household income and nutrition in sub-Saharan African countries. Families in sub-Saharan Africa spend as much as 60% of their income on food-related expenditures and an improvement in wealth condition is often translated into better access to food and healthcare services. Since most of the sampled households were engaged in agriculture and this sector makes a significant contribution to overall GDP, improvement in agricultural productivity of the country over the last decades may have played a vital role in nutrition improvement.

In order to facilitate further reductions in undernutrition and achieve the sustainable development goals, investment to boost agricultural production, stabilisation of price volatilities and implementation of policies to increase household income are crucial. Evidence also shows that nutrition interventions have assured effects on child health and development (Ruel et al, 2013). There is therefore a need to continue to focus on both nutrition-sensitive and nutrition-specific interventions that can boost child health and nutritional status.

¹ Biadgilign S, Shumetie A, Yesigat H (2016) Does Economic Growth Reduce Childhood Undernutrition in Ethiopia? PLoS ONE 11(8): e0160050. <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0160050>

² Defined as less than two standard deviations (-2SD) below the median height-for-age (stunting), weight-for-age (underweight) and weight-for-height (wasting), according to 2006 WHO growth standards.

References

- DNEAP: Poverty and Well Being in Mozambique: *The Third National Assessment*. National Directorate of Poverty Analysis and Studies, Ministry of Planning and Development, Maputo, Mozambique. 2010.
- O'Donnella O, Nicolásb ÁL, Doorslaerc EV: *Growing richer and taller: Explaining change in the distribution of child nutritional status during Vietnam's economic boom*. Journal of Development Economics 2009, 88(1):45–58.
- Ruel M, Alderman H, Group MaCNS: *Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition?* Lancet 2013, 382(9891).

Preparation and presentation of corn-soy blend:

Perceived benefits among lead mothers and caregivers of moderately malnourished children in Malawi

Summary of published¹ and unpublished research



By (left to right) Beatrice Lorge Rogers (Principal Investigator), Patrick Webb (Principal Investigator), Jocelyn Boiteau (Project Administrator), Breanne Langlois (Data Analyst), Gray Maganga (Field Research Coordinator), Shelley Walton (Project Manager) and Devika Suri (Data Manager).

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Location: *Malawi*

What we know: Supplementary feeding programmes (SFPs) typically involve the provision of fortified blended foods in bulk packaging for division at distribution points.

What this article adds: A recent cross-sectional study assessed the effectiveness of changes to an SFP (increased oil provision, social behaviour-change communication (SBCC) and new packaging) on caregivers compliance with recommended preparation methods of porridge. Published findings show that enhanced SBCC with an increased oil ration was the most effective and cost-effective intervention. Repackaging did not add to effectiveness but operational benefits were identified: improved hygiene; greater food safety assurance; correct amount of CSB received; and streamlined distribution/time taken. Future research on the effectiveness of repackaged food aid products is needed.

Background

According to the Malawi 2015-16 Demographic Health Survey preliminary report, 37% of children under five years old are stunted, 3% are wasted and 12% are underweight (NSO and ICF Macro, 2016). The prevention and treatment of moderate acute malnutrition (MAM) in food-insecure settings typically involves providing caregivers with supplementary foods to feed to the undernourished child (WHO, 2012). Fortified blended foods, such as corn-soy blend (CSB), prepared as a porridge, and vegetable oil fortified with vitamins A and D, are the most commonly used supplementary foods (Dewey and Adu-Afarwah, 2008).

The Wellness and Agriculture for Life Advancement (WALA) programme 2009-2014 was a United States Agency for International Development (USAID) Office of Food for Peace integrated food security programme/supplementary feeding programme (SFP) for children with MAM in Southern Malawi. The WALA programme distributed 1L of oil and 8kg of CSB to children aged 6-59 months diagnosed with MAM at food distribution points (FDPs).

Food Aid Quality Review effectiveness study in Southern Malawi

The Food Aid Quality Review (FAQR) at Tufts University carried out a cross-sectional effectiveness study of caregivers of beneficiary children aged 6-59 months enrolled in the WALA programme in four districts in Southern Malawi from March to July 2014. Lead mothers provided health education to participants in MAM treatment programmes. Beneficiary mothers/caregivers are referred to as 'caregivers'. The FAQR study assessed the effectiveness of programme changes on caregivers compliance with recommended preparation methods of CSB. Published findings show that enhanced SBCC with an increased oil ration was the most effective and cost-effective intervention (see Box 1). While both intervention groups were effective in achieving the target oil-to-CSB ratio, the repackaging did not result in added effectiveness. However, qualitative findings highlighted other potential benefits of the repackaging, which are shared in more detail below.

Repackaging CSB

The rationale to investigate repackaged CSB was informed by a formative evaluation of the WALA

programme that revealed challenges in the existing CSB ration distribution system (Kumwenda et al, 2016). Monthly rations of CSB were normally distributed to FDPs in 25kg sacks and the oil in 4L containers. A pre-measured 1kg capacity container was used to remove 1kg CSB. The remaining 24kg of CSB was poured into a large tub and given to three caregivers to sub-divide into their own containers using a spring scale (Figure 1). Some did not use the scale; for those who did, measurements were often rushed. This approach created potential for ration contamination, led to conflicts because of unequal division of the bulk CSB, and was time-consuming for caregivers and programme staff. Smaller pre-weighed and repackaged CSB were developed to address this (Figure 2).

As part of the larger study (see Box 1), semi-structured focus group discussions were conducted with caregivers. Three main themes around the smaller packaging emerged: improved hygiene to ensure food safety from production to consumption (WHO, 2006); correct amount of CSB received to prepare the ration correctly; and streamlined distribution to reduce time (see Box 2). Despite initial concerns that the more convenient packaging would promote diversion to the market, self-reported findings, complemented by visits to markets near FDPs, indicated that neither the oil nor the repackaged CSB was sold.

Although more research is needed, qualitative findings identify some potential benefits of the new packaging. The quality assurance system has set points throughout the supply chain that serve to prevent contamination of the food products. Distributed foods are marketed as safe and their

¹ Rogers BL, Wilner L, Maganga G, Walton S, Suri DJ, Langlois B, Chiu KKH, Boiteau J, Vosti S, Webb P. (2016). *Program changes are effective and cost-effective in increasing the amount of oil used in preparing corn soy blend porridge for treatment of moderate acute malnutrition in Malawi*. *Matern Child Nutr*. 2016; 1-10.

Box 1 Increasing the amount of oil used in preparing corn-soy blend porridge for treatment of moderate acute malnutrition in Malawi (Rogers et al, 2016)

CSB porridge is commonly prepared with oil for treatment of MAM. A recent review recommended that 30g of oil be used with 100g of CSB to increase energy density and micronutrient absorption (Webb et al, 2011). Some donors and implementing agencies argue that when oil is delivered as a separate commodity, it may be diverted for other uses; alternative supplements, such as ready-to-use supplementary food (RUSF), are favoured to overcome this potential risk; however such commodities are more expensive per treated child than CSB with oil given separately.

The objectives of the study were to: 1) evaluate the effectiveness and feasibility of achieving the target oil:CSB ratio in porridge prepared by caregivers; 2) evaluate the cost and cost-effectiveness of the two intervention groups compared to the control group; and 3) evaluate the determinants of effectiveness. The study also assessed the additional effect of repackaging CSB into smaller packets with printed messages to increase caregiver compliance with instructions on porridge preparation.

Caregivers of children in MAM SFPs were assigned to three groups. A control group received monthly rations of 1L oil, 8kg CSB in bulk and SBCC; intervention groups received 2.6L oil, 8kg CSB provided either in bulk (group 1) or four x 2kg packages with printed messages (group 2), and enhanced SBCC emphasising the target oil:CSB ratio.

Compared to the control, both intervention groups had higher mean added oil per 100g CSB (18g and 13g higher in groups 1 and 2, respectively), and greater odds of meeting or exceeding the target ratio (28.4 and 12.7 in groups 1 and 2, respectively). Cost per caregiver reaching the target ratio was most favourable in group 1. The cost per additional caregiver meeting or exceeding the target ratio beyond the number doing so in the control group was also most favourable in group 1. Enhanced SBCC combined with increased oil ration resulted in increased use of oil in CSB porridge in an SFP. Modified packaging did not improve effectiveness. However, both interventions were more cost-effective than standard programming.

Box 2 Selection of focus group feedback

A caregiver commented on the added hygiene provided by the packaging, "The packets are very good because the flour is protected from a lot of unhygienic things. For example, sometimes right here at the FDP while waiting to receive the ration a child might defecate herself; while cleaning the child, your name is called to go and receive [your ration], so without even washing hands you touch the ration, so the packets protect the ration from many things."

One lead mother recommended that the FDPs "should continue using the packet because in the past it was hard to receive the right quantity of the ration, while with the packets the women are assured that they have the right amount."

Some caregivers reported negative feelings about the smaller packets, including that the packages were too small and should be increased in size, have too much empty space, and did not have the right amount of CSB flour. One caregiver remarked, "I am not sure if the packets have the right amount – the CSB in the packets is different from the one we used to share amongst ourselves. When we share amongst ourselves, we share equally and we are sure we get the whole eight kilograms."

A lead mother explained what she liked about the small packaging, "Before the packets, women would spend a lot of time sharing the CSB amongst themselves but now once the vehicle arrives, they immediately receive the ration, so we can say that the packets are less time-consuming."

Figure 1 Bulk CSB distribution process



25kg bulk CSB



Caregivers dividing the ration



CSB ration poured into caregiver-supplied container

Figure 2 Repackaged CSB



2kg CSB packet



8kg bag holding four x 2kg packets



24kg master bag holding three x 8kg bags

quality and package integrity should be maintained throughout the entire process until the beneficiary consumes the products. Observations at FDPs demonstrated potential points of contamination of food products in bulk packaging compared to repackaged CSB. In addition, the repackaged product may increase the likelihood of the child receiving the correct ration amount and a more streamlined distribution scheme can help reduce the time burden on caregivers and distribution partners.

Conclusions and research needs

While repackaging did not add to the effectiveness of the intervention, qualitative investigation found potential programming advantages. Future research on repackaged food aid products should evaluate effectiveness and cost-effectiveness in terms of hygiene, delivery of correct ration amounts and streamlined distribution processes. Additional field studies are ongoing to look at some priority questions raised in the overall study, particularly the cost-effectiveness of different products (CSB and RUSF) in similar settings for the prevention and treatment of MAM.

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References

- National Statistical Office (NSO) and ICF Macro. (2016) *Malawi Demographic and Health Survey 2015-16: Key Indicators Report*. Zomba, Malawi and Rockville, Maryland, USA. <https://dhsprogram.com/pubs/pdf/FR319/FR319m.pdf>
- WHO (2012) *Supplementary foods for the management of moderate acute malnutrition in infants and children 6-59 months of age*. Technical note. www.who.int/nutrition/publications/moderate_malnutrition/9789241504423/en/
- Dewey KG and Adué-Afarwuh S. (2008). *Systematic review of the efficacy and effectiveness of complementary feeding interventions in developing countries*. *Matern Child Nutr*. 2008; 4:24-85.
- Webb P, Rogers BL, Rosenberg I, Schollosman N, Wanke C, Bagrianskey J, Sadler K, Johnson Q, Tilahun J, Masterson AR et al. (2011). *Improving the nutritional quality of U.S. food aid: recommendations for changes to products and programs*. Boston, MA: 2011. Available from http://pdf.usaid.gov/pdf_docs/pnad841.pdf
- Kumwenda G, Nlema B, Maganga G, Rogers B, Walton S, Boiteau JWP, Webb P. (2016) *Feasibility and acceptability study of preparing corn soy blend with fortified vegetable oil in Malawi: formative research*. A report from the Food Aid Quality Review. Boston, MA; 2016. Available from: http://pdf.usaid.gov/pdf_docs/PA00M6CS.pdf
- WHO (2006). *Five keys to safer food manual*. Geneva, 2006. Available from: http://www.who.int/foodsafety/publications/consumer/manual_keys.pdf
- Rogers B, Maganga G, Walton S, Jayson L, Passarelli S, Suri D, Langlois B, Chui KK, Boiteau J, Ignowski E, Rosenberg I, Vosti S, Webb P. (2015) *Feasibility and acceptability study of corn soy blend and fortified vegetable oil in Malawi*. Report to USAID from the Food Aid Quality Review. Boston, MA, 2015. Available from: http://pdf.usaid.gov/pdf_docs/PA00M9BB.pdf
- Rogers BL, Wilner LB, Maganga G, Walton SM, Suri DJ, Langlois BK, Chiu KK, Boiteau JM, Vosti SA, Webb P. (2016). *Program changes are effective and cost-effective in increasing the amount of oil used in preparing corn soy blend porridge for treatment of moderate acute malnutrition in Malawi*. *Matern Child Nutr*. 2016; 1-10.

The impact of in-kind food assistance on pastoralist livelihoods in humanitarian crises

Summary of research¹



Location: *Global*

What we know: External threats to food security of pastoralist populations in recent years have increased the need for humanitarian assistance, including food assistance.

What this article adds: A recent literature review (24 published papers, 1983-2015) considered impacts of in-kind food assistance on pastoralist populations. Evidence suggests that food assistance to pastoralist populations can reduce food insecurity. However, there are also examples of negative impacts, including erosion of pastoralist livelihoods and increased sedentarisation. The lack of high-strength evidence and poor quality of publications available to the review means assessment of the impact is inconclusive. High quality, multidisciplinary research to make valid inferences about the causal relationships between food assistance and various aspects of pastoralist livelihoods is required.

Pastoralists rely on coping and adaptation strategies that have historically allowed them to achieve high levels of productivity, cope with hazards and moderate the impact of shocks (Butt et al, 2009; Hesse and Pattison, 2013; Morton, 2006). However, increased pressure from climate change, political marginalisation, loss of grazing land and restrictions on mobility has threatened the food security of many pastoralist populations and outside humanitarian assistance has been required (Markakis, 2004). Nutrition and food security have been the priorities of most humanitarian interventions, which have usually involved direct provision of food in kind. The purpose of this review was to identify, synthesise, evaluate and estimate both the short and long-term effects that the provision of food assistance has had on pastoralists and their livelihoods. The review considered all potential impacts of in-kind food assistance on all pastoralist populations that have been affected by humanitarian emergencies in the period since 1967 (when the Food Aid Convention was negotiated). The review aimed to verify the quality of existing evidence, help researchers identify the strengths and weaknesses of the evidence, and thereby identify potential improvements and opportunities in future research.

Twelve key questions were investigated that mapped onto six thematic outcome areas (see Table 1). A total of 23,424 publications were identified in an initial search of academic databases and an additional 1,442 from grey literature sources. Following screening and quality appraisal, 24 of these were deemed suitable for

synthesis. These publications were published between 1983 and 2015 (with the majority since 2000); are mainly primary studies; and use a mix of qualitative methods (n=13), quantitative methods (n=6) and mixed methods (n=5). Collectively, the selected papers report food assistance interventions during or after humanitarian crises that had the following characteristics:

- Took place between 1967 and 2012;
- Lasted between one and 20 years;
- Were predominantly drought-related (n=21) but had other identified causal factors, including conflict (n=3), famine (n=4), flood (n=2) and disease (n=1);
- Took place primarily in countries in the East and Horn of Africa, with the remainder in Algeria, Niger and Mongolia;
- Targeted populations of between 6,000 and an estimated 20 million people;
- Involved unconditional provision of food in-kind (n=23) or in exchange for assets (livestock) and work (n=2); and
- Were carried out by non-governmental organisations (NGOs) (n=7), United Nations agencies (n=5), national governments (n=4), religious bodies (n=2) or a combination of these (n=6).

Findings against thematic outcomes are summarised in Table 1.

Evidence from these studies shows that food assistance can in some cases achieve its primary goal of addressing food insecurity. Evidence from Kenya and Somalia indicates that some food assistance interventions have led to a decrease in

prevalence of malnutrition. On the other hand, provision of food assistance in Ethiopia and Sudan is claimed to have had negative impacts on health outcomes. The strength of evidence relating to this theme is limited. Provision of food assistance can contribute – and, as evidence from Kenya and Sudan indicates, has contributed – to the erosion of pastoralist livelihoods. For example, McCabe (1990) describes a causal chain whereby the provision of free food in Kenya led pastoralists to settle near relief distribution centres, contributing to the degradation of surrounding land and forcing livestock to forage on less nutritious plants. This led to starvation and disease among livestock, ultimately undermining pastoralist livelihoods. In other examples however, interventions have enabled some pastoralists to hold on to their assets, including livestock, and have supported their incomes. The strength of evidence relating to this theme is medium.

There is fairly uniform but not necessarily reliable evidence (due to its limited strength) from Kenya and Sudan that the provision of food assistance leads to changes in pastoralists' mobility patterns, especially sedentarisation. Claims that food assistance can lead to dependency are relatively widespread but there is no identified empirical evidence of a causal relationship.

In some reported cases in Kenya, Mongolia and Sudan, the modes of targeting food assistance have led to controversy within pastoralist communities related to unequal distribution, perceived unfairness and elite capture. Elsewhere, they have effectively encouraged the emergence of new political leaders who have sought to channel assistance to their clients and, by extension, have restricted some intended beneficiaries' access to food. Conversely, one publication reports that an intervention in Kenya encouraged sharing of food and thereby strengthened existing social networks. The strength of evidence relating to these themes is limited.

This review uses guidelines developed by the UK Department for International Development (DFID) (DFID, 2014) to evaluate the strength of evidence reported in the included publications. Based on these criteria, the authors do not consider the strength of evidence reported in any of the publications to be high. The strength of evidence in 13 publications is classified as moderate, while the remaining 11 publications report evidence of low strength. Causal inferences made in publications are especially problematic. In most publications, the method of analysis is not reported; causal claims are not supported by evidence and are reported as the authors' impressions of observed events or outcomes.

The lack of high-strength evidence means the assessment of the impacts of food assistance on pastoralists contained in this review is inconclusive. While conducting research in the context of humanitarian crises is difficult, the inadequate quality of the publications makes it impossible to reliably

¹ Czuba K, O'Neill TJ and Ayala AP (2017). *The impact of food assistance on pastoralist livelihoods in humanitarian crises: An evidence synthesis*. Humanitarian Evidence Programme. Oxford: Oxfam GB.

evaluate the impacts of common types of humanitarian intervention targeting some of the world's most vulnerable populations.

The findings of this review highlight the necessity of future multidisciplinary research and evaluation that can make valid inferences about the causal relationships between food assistance and various aspects of pastoralist livelihoods. Such high-quality research could be both qualitative and quantitative, but should include experimental and prospective cohort studies, as well as retrospective cohort designs which rely on validated methods, with disaggregated outcomes by age, gender and mobility patterns.

References

- Butt B, Shortridge A and WinklerPrins AMGA. (2009). *Pastoral Herd Management, Drought Coping Strategies, and Cattle Mobility in Southern Kenya*. Annals of the Association of American Geographers, 99(2):309–34.
- Department for International Development (DFID). (2014). *Assessing the Strength of Evidence*. London: DFID. Retrieved 13 July 2016
- Hesse C and Pattison J (2013). *Ensuring Devolution Supports Adaptation and Climate Resilient Growth in Kenya*. London: IIED. Retrieved 28 April 2016, from <http://pubs.iied.org/17161IIED.html>
- Markakis J (2004). *Pastoralism on the Margin*. London: Minority Rights Group International.
- McCabe T (1990). *Success and Failure: The Breakdown of Traditional Drought Coping Institutions Among the Pastoral Turkana of Kenya*. Journal of Asian and African Studies XXV (3–4): 146–60.
- Morton J (2006). *Pastoralist Coping Strategies and Emergency Livestock Market Intervention*. In McPeak JG and Little PD (eds), *Pastoral Livestock Marketing in Eastern Africa: Research and Policy Challenges*. ITDG Publishing, Warwickshire, pp. 227–46.

Table 1 The impact of in-kind food assistance on pastoralists' livelihoods: Summary of findings²

Thematic outcome	Number of studies	Evidence strength	Findings
1. Changes in livelihood strategies and asset and income dynamics	11	Medium	Food assistance can undermine the livelihood strategies of pastoralists; can lead to reduced livestock sales and strengthen herd growth; may fill gaps in pastoralist's incomes; and can lead to changes in pastoralists' mobility patterns, especially sedentarisation.
2. Mobility patterns	9	Limited	Food assistance can lead to changes in pastoralists' mobility patterns, and especially to sedentarisation.
3. Access to in-kind food assistance	7	Limited	Food assistance to pastoralists can be insufficient and unbalanced. Four publications claim that food assistance can lead to dependency, but there is no relevant empirical evidence. According to one publication, food assistance can lead to an increase in alcohol production. In some cases, food assistance targeting has been controversial where pastoralists have perceived issues of unfairness, unequal distribution and elite capture.
4. Household and individual-level sociodemographic factors	7	Limited	Food assistance can encourage pastoralist women to seek alternative livelihood strategies. According to most publications, food assistance leads to decreased malnutrition. Others report, however, that food assistance can have negative impacts on recipients' health outcomes.
5. Social relations and governance	4	Limited	Food assistance can both strengthen relations within existing social networks and contribute to the emergence of new political leaders (and displacement of their predecessors).
6. Security	4	Not applicable	The publications do not make a link between food assistance and security.

The effects of DFID CTPs on poverty and vulnerability

Summary of research¹

Location: Global

What we know: Cash transfers are an important element of national social protection systems to alleviate poverty and vulnerability.

What this article adds: A recent review assessed the impact of DFID-supported national cash transfer programmes (CTPs) between 2011 and 2015 on poverty and vulnerability, development of sustainable, nationally-owned CTPs and on value for money. Health and nutrition objectives are included in all DFID CTPs, which overall are having a "satisfactory" impact on poverty and vulnerability, having reached 9.3 million people (six million target). Country ownership of CTPs has increased but systematic financial and technical assistance and strategic oversight is lacking. Value-for-money criteria are largely met and a large research portfolio has contributed to the evidence base. Impact on secondary objectives is more variable; evidence of impact on health and nutrition is uneven, both within and between programmes, with scope to optimise. Recommendations are made regarding scale-up, clarity regarding impact in programme design, women's empowerment and strategic approach to technical assistance on CTPs.

Cash transfers are an important element of national social protection systems and help to alleviate poverty by supplementing household income, thereby increasing food consumption and access to education and health services, among other benefits.

Under its global results framework for 2011–15, the UK Department for International Development (DFID) committed to reaching at least six million people with cash transfers. Over this period, DFID spent an average of £201 million per year – around 2% of its total expenditure – on the support of national cash-transfer programmes (CTPs)², either through direct funding or the provision of technical and financial support for system-building. Most of these programmes fall within DFID's social pro-

¹ Independent Commission for Aid Impact (ICAI) (2017). *The effects of DFID's CTPs on poverty and vulnerability: An impact review*. January 2017. Available from: <http://icai.independent.gov.uk/report/cash-transfers/>



WFP/Berna Cetin

Cash transfers
in Turkey, 2016

tection portfolio, contributing to the “poverty, vulnerability, nutrition and hunger” pillar of DFID’s results framework, and aim to have positive effects on nutrition and health.

This review by the Independent Commission for Aid Impact (ICAI) explored the impact of DFID CTPs from 2011–2015 on poverty reduction. The authors conducted desk reviews of 18 of the 28 DFID programmes and detailed case studies of programming in two countries: Bangladesh and Rwanda. The review addresses three broad areas: (1) The impact of DFID-supported cash transfers on poverty and vulnerability, including health and nutrition; (2) DFID’s contribution to the development of sustainable, nationally-owned cash transfer systems; and (3) The value for money of DFID’s cash-transfer programming.

The 2015 DFID Annual Report showed that between 2011 and 2015 the department had

reached a “peak”³ of 9.3 million people with cash transfers, against a target of six million. The authors examined this claim thoroughly and found some inclusion errors in the data that led to over-reporting of around 475,000 people, all from one programme. These errors were corrected when brought to DFID’s attention. For the rest of the programme portfolio, the authors verify that DFID had exceeded its target.

The authors report that DFID CTPs have succeeded in their primary purpose of alleviating extreme poverty. Programmes have consistently helped to improve household incomes and boost consumption levels of food and other basic items, with no evidence of increases in unhealthy consumption choices (e.g. alcohol or gambling). The evidence suggests a modest but positive impact on savings, asset accumulation and debt reduction, which in turn increases household resilience to shocks.

In terms of education, results of DFID-funded programmes are uneven, with some showing a positive contribution to school attendance but others only modest impact. There are encouraging signs of women’s empowerment in DFID-funded programmes but the evidence is not strong enough to support a clear conclusion.

Health and nutrition objectives are included in all DFID CTPs. This reflects empirical evidence from the literature that cash transfers can promote both greater use of health services and more dietary diversity, although impacts on child wasting and stunting are generally weaker. Evaluations of DFID-funded programmes show a wide range of uneven results, including some cases where no positive effect was observed.

In some instances, health and nutrition objectives are not being achieved; in Ethiopia and Bangladesh, DFID is supporting experiments combining cash transfers and other types of health and nutrition-related support in order

to improve results. The available evidence suggests that several of the programmes DFID is supporting are currently not optimised for maximum impact on nutrition and health and that improvements in design and implementation – including timeliness and transfer size – could strengthen results in this area.

Overall, in the context of the ICAI’s traffic-light award system⁴, DFID CTPs were awarded a green-amber score for impact on poverty and vulnerability, DFID having achieved and exceeded its global-reach targets and across the portfolio. Impact on secondary objectives are more variable and evidence of impact on health and nutrition is uneven, both within and between programmes, with a pattern of results that DFID is sometimes unable to explain.

Wherever possible, DFID funds cash transfers through national programmes. The review finds that DFID has good relations with its national counterparts and has helped to increase country ownership of CTPs. However, a systematic approach to both financial and technical assistance is lacking, with no overall clearly stated rationale or strategy for DFID’s efforts in this area. There is also a lack of adequate monitoring and assessment of the results of its system-building activities. The authors therefore awarded DFID an amber-red in this area.

The review finds that DFID’s support for cash transfers meets many of the criteria for value for money. It is consistently delivering on its core objective of alleviating extreme poverty and reducing vulnerability. However, there may be a value-for-money case for scaling up funding towards national coverage. DFID has made an important contribution to building up evidence on what works in CTPs. During the review period, it managed a centrally-commissioned research portfolio of over £35 million that has been innovative in both themes and methodology and has demonstrated a willingness to learn from international evidence and from DFID’s own programmes. On this basis, the authors rated DFID’s portfolio as green-amber on value for money.

Conclusion and recommendations

The authors make four recommendations for the further improvement of DFID CTPs (Box 1). They conclude that, overall, DFID’s cash transfer portfolio merits a green-amber score. The portfolio has demonstrated its capacity to achieve impact in its core objective of alleviating extreme poverty. DFID has also made an important contribution to encouraging the spread of national protection systems. There may be scope to achieve even greater value for money by scaling up successful programmes.

Box 1 Recommendations to DFID

DFID should consider options for scaling up contributions to CTPs where there is evidence of national government commitment to improving value for money, expanding coverage and ensuring future financial sustainability.

DFID should be clearer about the level and type of impact it is aiming for in each of its CTPs and ensure that these are adequately reflected in programme designs and monitoring arrangements.

DFID should do more to follow through on its commitment to empowering women through cash transfers by strengthening its monitoring of both results and risks and using these data to inform innovations in programming.

DFID should take a more strategic approach to technical assistance on national cash transfer systems, with more attention to prioritisation, sequencing, monitoring and oversight.

² National programmes did not include humanitarian assistance but included any kind of regular payments made to individuals and households, such as child-support grants, old-age pensions, payments to vulnerable groups such as widows and people with disabilities and transfers to particularly poor households.

Is exposure to animal faeces harmful to child nutrition and health outcomes?

Summary of research¹



Bangladesh, 2015

WFP/ Leonora Beck

Location: *Ethiopia, Bangladesh and Vietnam*

What we know: Sub-clinical environmental enteric disorder (EED) is an important causal pathway from poor sanitation and hygiene to stunting; exposure to animal faeces may be an important risk factor for EED.

What this article adds: ‘Alive and Thrive’ survey data were used for 2,214, 1,750 and 2,104 children age 6–23.9 months of age in Bangladesh, Vietnam and Ethiopia respectively to examine relationships between exposure to animal faeces and stunting, wasting and child morbidity. Animal faeces were visible in 38–42% of household compounds in all three countries. A significant association was found between observed animal faeces and maternal and child cleanliness (odds ratios between 0.52 and 0.71) and between the presence of animal faeces and child height-for-age z (HAZ) scores in Ethiopia ($\beta = -0.22$), Bangladesh ($\beta = -0.13$) and all countries ($\beta = -0.11$). An association between hygiene indicators and diarrhoea was found in Bangladesh only. Findings are consistent with an infection/EED pathway to stunting and suggest that this can be mediated by exposure to animals and their faeces. Behaviour-change communication (BCC) strategies should aim to reduce exposure to animal as well as human excreta and should aspire to “total sanitation”.

It has recently been hypothesised that exposure to livestock constitutes a significant risk factor for diarrhoea and environmental enteric disorder (EED) in young children, which may significantly contribute to undernutrition (Zambrano et al, 2014); however to date very little research has documented the extent of exposure to animal faeces and whether this exposure is associated with child nutritional status in large samples and diverse settings. This study uses data from large-scale nutrition surveys conducted in Ethiopia, Bangladesh, and Vietnam to address three research questions within these quite different socioeconomic contexts: how prevalent are observable animal faeces in household compounds; what factors are most strongly associated with observable animal faeces; and is the presence of animal faeces significantly associated with child height for age, child weight for height, and child morbidity symptoms?

The data for this study are drawn from baseline and endline surveys conducted in rural areas of Bangladesh, Ethiopia, and Vietnam in 2010 and 2014 as part of the ‘Alive and Thrive’ project aimed at reducing undernutrition and death caused by sub-optimal infant and young child feeding (IYCF) practices. The surveys include high-quality data, using large samples on child anthropometry, morbidity symptoms and their determinants, including hygiene spot-checks for the presence of animal faeces in the homestead compound as well as more standard indicators

of household hygiene, such as cleanliness of mothers, young children and the homestead environment². As the primary research interest was infants who are more likely to be left on the ground by themselves and more likely to engage in exploratory mouthing behaviours or geophagy, only the sub-sample of children 6–23.9 months of age was used. Data on anthropometry and hygiene indicators were available for 2,214, 1,750, and 2,104 mother and child dyads in Bangladesh, Vietnam, and Ethiopia, respectively. Statistical models controlled for a wide array of child, maternal and household factors known to be associated with child anthropometry/undernutrition or child illness. In order to explore external validity issues, these data were analysed for each country separately using regression models that pooled data from all three countries.

Results

Results of the study show that animal faeces were visible in 38–42% of household compounds across the three countries and were positively associated with household livestock ownership and negatively associated with maternal and child cleanliness. Results show highly significant and robust associations between observed animal faeces and maternal and child cleanliness (with odds ratios that vary between 0.52 and 0.71), although there are no significant associations with toilet or water facilities (except in the case of hygienic toilets in Vietnam). One-sided tests from multivariate least squares models for chil-

dren 6–24 months of age indicate that the presence of animal faeces is significantly and negatively associated with child height-for-age z (HAZ) scores in Ethiopia ($\beta = -0.22$), Bangladesh ($\beta = -0.13$), and in a pooled sample for all three countries ($\beta = -0.11$), but not in Vietnam. No significant associations were found between weight-for-height z (WHZ) scores and animal faeces in any of the countries. An association between hygiene indicators and diarrhoea was found in Bangladesh only, the odds ratio for which suggests that the presence of animal faeces increases the risk of diarrhoea by 25%.

Discussion and conclusions

Livestock ownership may have positive effects on child growth through improvements in household socioeconomic status, animal-sourced food consumption and other mechanisms (transportation, social status, women’s empowerment, collateral for credit), but negative impacts through increased risk of infections and/or EED. Consistent

¹ Headey DD, Nguyen PH, Kim SS, Rawat R, Ruel MT and Menon P. Is exposure to animal feces harmful to child nutrition and health outcomes?: A multicountry observational analysis. The American Journal of Tropical Medicine and Hygiene. Article in Press. First available online December 19, 2016. <https://doi.org/10.4269/ajtmh.16-0270>

² Interviewers recorded observations of cleanliness of the mother and her child (hair, hands, faces and clothing) on a three-point scale of clean, dusty or dirty and yes/no observations of household cleanliness (based on presence of human faeces, rubbish, dirty clothes and a cover on the main drinking water container).

with an infection/EED pathway, in Bangladesh and Ethiopia the presence of animal faeces in the compound is negatively associated with child HAZ. In Ethiopia, livestock ownership was also positively associated with child HAZ outcomes. However, there were no similar associations in the Vietnam sample; this may be due to lower prevalence of EED or diarrhoeal infection in general and better care practices for children.

The authors conclude that these findings contribute to a growing body of evidence suggesting that child anthropometry and health outcomes in developing countries may be adversely affected by exposure to animals and their faeces. This risk stems from several factors, including the widespread ownership of livestock and pets in developing countries; the lack of

housing and enclosure structures for livestock that separate animals from household members (e.g. scavenging poultry systems); poor hygiene knowledge and practices; the common practice of leaving children to sit or play on homestead floors with little monitoring (especially in warmer climates); and the very high concentration of potentially harmful bacteria in animal faeces.

This literature points to the need to re-evaluate several core features of conventional water, sanitation and hygiene (WASH) strategies. First, most WASH strategies have focused on influencing diarrhoea and morbidity outcomes rather than on sub-clinical EED. Second, most WASH strategies have focused behaviour-change communications on a small number of key messages with emphasis on reducing exposure

to human faeces, assuming this poses a greater health burden (to children especially) than exposure to animal faeces. While open defecation remains a major health concern in much of the developing world, exposure to animal faeces is probably more common and potentially also hazardous for child nutrition and health outcomes. Behaviour-change communications strategies should therefore consider reducing exposure to all excreta, human and animal, and aspire to genuine “total sanitation.”

References

Zambrano LD, Levy K, Menezes NP, Freeman MC, 2014. Human diarrhoea infections associated with domestic animal husbandry: a systematic review and meta-analysis. *Trans R Soc Trop Med Hyg* 108: 313–325

Impact of maternal undernutrition and childbearing in adolescence on offspring stunting

Summary of research¹

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Secondary School Feeding Programme in Andhra Pradesh

Location: *Ethiopia, India, Peru and Vietnam*

What we know: Maternal undernutrition and adolescent childbearing increase risks to mothers' and offspring's survival, health and development.

What this article adds: A recent Young Lives study investigated associations between maternal stunting and adolescent childbearing and offspring outcomes, and the extent of catch-up growth in adolescent girls from two data cohorts in Ethiopia, India, Peru and Vietnam. Findings suggest maternal stunting is associated with offspring stunting in infancy through to early adolescence. The association between adolescent childbearing and offspring stunting is weaker and does not persist into adolescence; most adolescent mothers gave birth in late adolescence, which may have influenced results. There is no evidence of significant and systematic increased risk of stunting in offspring if a stunted mother gives birth during adolescence (compared to an adult stunted mother). Mother's stunting was not associated with offspring cognitive achievement. Coexistence in the mother of stunting and adolescent childbirth does not increase the risk of stunting in her offspring. There was evidence of catch-up growth of girls in adolescence, mostly between the ages of 12 and 15 years; a large share of maternal undernutrition is likely to reflect environments and experiences during adolescence.

Maternal undernutrition during pregnancy and adolescent childbearing are very prevalent in low- and middle-income countries and are among the primary risks to mothers' and their offspring's survival, health, and development. Maternal height and age at childbearing is associated with offspring nutritional status and schooling, but few studies examine how these associations evolve over the offspring's life course.

No study has investigated whether the implications of maternal stunting for offspring health and development is exacerbated by adolescent pregnancy. In addition, the potential for catch-up growth and the extent of growth plasticity during adolescence is not well established.

To address these gaps, a recent study undertook two interrelated investigations using existing Young Lives data (12,000 children) from Ethiopia,

India, Peru and Vietnam:

- 1) Used cohort data of children and their mothers to examine associations between maternal stunting and adolescent childbearing, and offspring stunting and cognitive

¹ Benny L, Doran P and Georgiadis A. (2017). *Maternal Undernutrition and Childbearing in Adolescence and Offspring Growth and Development in Low- and Middle-Income Countries: Is Adolescence a Critical Window for Interventions Against Stunting?* Young Lives, February 2017.

achievement from the offspring's infancy and early childhood to early adolescence.

- 2) Used longitudinal data on another cohort of girls who were followed throughout adolescence to estimate the extent of catch-up growth (i.e. whether maternal adult undernutrition reflects undernutrition during adolescence).

Method

Cohorts comprised approximately 2,000 children in each country born in 2001/02 (the younger cohort) and roughly 1,000 children in each country born in 1994/95 (older cohort) over 15 years. Information is also collected on the child's primary caregiver (usually biological mother). The first investigation used data from the younger cohort and their mothers from the four rounds of the study, when the children were around one, five, eight and 12 years old. The second investigation used data on the older cohort of girls in rounds 2, 3 and 4 of the survey, when they were approximately 12, 15 and 19 years old respectively.

Nutritional status for young cohort children and their mothers was based on stunting status (stunted defined as height-for-age z scores (HAZ) < -2, 2006 WHO growth standards). Height was also used to assess catch-up growth among older cohort girls during adolescence. Maternal height was measured once in 2006 when all mothers were adults, and HAZ scores were calculated using the 2007 WHO reference for women at age. The age of the mother at the birth of the younger cohort was calculated using information on her age in completed years at the time of the survey and on the date of birth of the younger cohort child. Adolescent childbearing was defined as giving birth at the age of 19 years or younger. Cognitive development of younger cohort children was also assessed at ages five, eight and 12 years using quantitative achievement tests.

Results

Results show that mother's stunting has a positive and significant association with offspring stunting in infancy and that this association persists through to early adolescence (age 12). Adolescent childbearing is also positively and significantly associated with the probability that offspring will be stunted in infancy, but this association is weaker than that between mother and offspring stunting and does not persist in magnitude and significance through to age 12. There is no evidence of significant and systematic increased risk of stunting in offspring if a stunted mother gives birth during adolescence (compared to an adult stunted mother) or that the offspring of stunted mothers or mothers who give birth

during adolescence have significantly poorer performance in quantitative cognitive tests.

Results may be explained by the fact that most mothers in the sample gave birth in late adolescence, between 17 and 19 years old (90%), with a large share (50%) giving birth at 19 years, when the risk of adverse pregnancy and delivery outcomes is lower relative to early adolescence. Results show that child stunting tends to be worse the younger the mother is at birth, particularly when children were one year old, although

up growth during adolescence where average height-for-age increased by around 50% between 12 and 19 years old. Regression-based estimates of catch-up growth cannot be explained by delayed onset of puberty, as the timing of the onset of puberty is included among the controls. Only 6% of mothers of younger cohort children in Ethiopia were stunted in adulthood; since stunting prevalence was high during the period of the mother's childhood, this suggests catch-up growth after early childhood rather than due to low childhood stunting rate.

Since urban households in the study were, on average, poorer than those in representative sample, sample selection does not explain results. These estimates of catch-up growth suggest a large share of maternal undernutrition is likely to reflect environments and experiences during adolescence. This result is consistent with several studies that documented growth plasticity during adolescence (Coly et al, 2006; Prentice et al, 2013) including one using Young Lives data (Fink and Rockers, 2014) and with other studies highlighting the importance of adolescent girls' diet and micronutrient intake for their offspring's growth and development (Black et al, 2013). This study goes further to highlight that improvements in mother's nutrition during adolescence may generate gains in her offspring's growth through the offspring's life course by promoting catch-up growth in the mother.

Overall, the findings reinforce concerns over the long-term implications of mother's nutritional status for their children's healthy growth. An important implication of these findings is that interventions that aim to delay childbearing and promote catch-up growth among adolescent girls, particularly in early adolescence, may be effective in breaking the intergenerational cycle of stunting in low- and middle-income countries.

References

- Black, R.E., C.G. Victora, S.P. Walker, Z.A. Bhutta, P. Christian, M. de Onis, ... R. Uauy (2013) 'Maternal and child undernutrition and overweight in low-income and middle-income countries', *The Lancet* 382.9890: 427–451. [https://doi.org/10.1016/S0140-6736\(13\)60937-X](https://doi.org/10.1016/S0140-6736(13)60937-X)
- Coly, A.N., J. Milet, A. Diallo, T. Ndiaye, E. Bénéfice, F. Simondon, K.B. Simondon (2006) 'Preschool stunting, adolescent migration, catch-up growth, and adult height in young Senegalese men and women of rural origin', *The Journal of Nutrition* 136.9: 2412–20.
- Fink, G., and P.C. Rockers (2014) 'Childhood growth, schooling, and cognitive development: further evidence from the Young Lives study', *American Journal of Clinical Nutrition* 100.1: 182–188. <https://doi.org/10.3945/ajcn.113.080960>
- Prentice, A.M., K.A. Ward, G.R. Goldberg, L.M. Jarjou, S.E. Moore, A.J. Fulford, and A. Prentice (2013) 'Critical windows for nutritional interventions against stunting', *The American Journal of Clinical Nutrition* 97.5: 911–8. <https://doi.org/10.3945/ajcn.112.052332>



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results were unstable and imprecise due to the small number of mothers in this sample who gave birth very young. A potential explanation of the finding that mother's stunting is strongly and significantly associated with offspring stunting, but not with offspring cognitive achievement, could be that changes in the offspring's environment, such as access and quality of schooling and learning, may compensate for cognitive deficits arising from early undernutrition, even if they do not improve a child's nutrition.

Results of the study found evidence of catch-up growth among girls in adolescence. Around 40% of the height deficit among girls with height lower than the WHO standard at 12 years old was recovered by age 19. The largest share of catch-up growth occurred between the ages of 12 and 15 years old. Growth pattern data for Ethiopia, in particular, are supportive of catch-

Impact of a conditional cash transfer programme on determinants of child health in Colombia

Summary of research¹

Location: *Colombia*

What we know: Conditional cash transfer (CCT) programmes have demonstrated large impacts on child education, health and nutritional outcomes; less is known about their impact on determinants of child health.

What this article adds: A secondary analysis of an evaluation of the Familias en Accion (FA) CCT programme in Colombia was carried out to assess impact on determinants of child health. Children and their families were surveyed in 2002, 2003 and 2005–6 in 31 treatment municipalities (n=1450) and 61 matched control municipalities (n = 1851). FA was associated with a significant increase in the probability of using preventive care services (OR=1.85, 95% CI 1.03, 3.30) and growth and development check-ups (β =1.36, 95% CI 0.76, 1.95). It also had a positive impact on dietary diversity and food consumption. No effect was observed on maternal employment, women's empowerment, and knowledge, attitudes and practices with regard to caregiving. Overall, FA's impact was more marked in rural areas. The study shows that CCT in Colombia increases contact with preventive care services and improves dietary diversity but is less effective in influencing mother's employment decisions, empowerment and knowledge of caregiving practices.

Conditional cash transfer (CCT) programmes provide cash to low-income families in return for fulfilling specific behavioural conditions. Conditions often include mothers fulfilling a schedule of regular primary healthcare visits for pre-school children, such as adherence to vaccination, growth monitoring and attendance to informative sessions, and children regularly attending school. Studies worldwide have demonstrated large impacts of CCT programmes on child education, health and nutritional outcomes directly associated with pre-specified conditions. However, the impact of CCT programmes on multiple well-known determinants of child health has been less well explored or evidence has been mixed or inconsistent. This study examined the impact of a CCT programme in Colombia on use of preventive health services; food consumption and dietary diversity; mother's knowledge, attitudes and practices in relation to caregiving; maternal employment; and women's empowerment. The study also examined whether the programme had different effects across rural and urban areas.

The study was based on a secondary analysis of a quasi-experimental evaluation of Familias en Accion (Families in Action (FA)), the CCT programme in Colombia. FA includes both health and educational components. The health component provides cash to mothers of poor households on the condition that children younger than seven years old regularly attend growth and development check-ups as well as vaccination programmes, and mothers attend educational workshops on nutrition, hygiene and contraception. For the education component, children aged 7–17 years must also regularly attend school for at least 80% of the school year in exchange for cash. All transfers are delivered to the mother in the household.

The evaluation was carried out by the Institute for Fiscal Studies, an independent research institute

in London, UK. A detailed survey was conducted in 122 treatment and control municipalities with a baseline assessment in 2002 and follow-up assessments in 2003 and 2005–06. A stratified and probabilistic sample of 57 treatment municipalities representative of the 622 eligible municipalities was selected. These municipalities were matched to 65 control municipalities, based on similarities to treatment municipalities in observed characteristics. Children under seven years of age in treatment (n=2394) and control (n=3197) groups were randomly selected to take part in household surveys. A first follow-up assessment was carried out in 2003 and included 2010 treated children and 2606 control children who had previously been measured in 2002. A second follow-up assessment was carried out between 2005 and 2006 and included 1,450 and 1,851 children in both control and treatment areas who were evaluated in 2002 and 2003. These were considered as the final sample for the analysis. In each round, questions were asked of mothers within households about attendance at health services and workshops, child's consumption of certain foods, employment, how decisions are made in the household with regard to child health and mother's knowledge, and attitudes and practices with regard to caregiving. Dietary diversity was assessed by creating a simple dietary diversity score (DDS) using consumption data. Data on municipal services supply were also collected based on a survey among health centres and schools. A difference-in-differences approach was applied to the data using logistic or linear regression, separately examining effects for urban and rural areas.

Results show that the FA programme was associated with an increase in use of healthcare preventive services (OR=1.85, 95% CI 1.03, 3.30); this association was particularly marked in rural areas (OR=2.63, 95% CI 1.31, 5.27). The FA programme increased attendance at the growth and development

check-ups (OR=5.09, 95% CI 2.88, 8.99) as well as the frequency of these check-ups (β =1.36, 95% CI 0.76, 1.95) in both rural and urban areas. Likewise, the programme was associated with a higher mother's attendance at educational workshops on diarrhoea (OR=2.36, 95% CI 1.42, 3.92), prenatal care (OR=2.92, 95% CI 1.74, 4.89) and acute respiratory infections (OR=2.57, 95% CI 1.44, 4.60) in rural and urban areas. There was no effect on attendance at nutrition workshops. In rural areas, children in treatment municipalities had larger increases in the consumption of meat, eggs and dairy products than children in control municipalities and had increased dietary diversity (OR=2.13, 95% CI 1.25, 3.65). In urban areas, children in treatment municipalities experienced larger increases in the consumption of fish, eggs and vegetables than children in control municipalities; however no differences were found in the dietary diversity between control and treatment groups (OR=1.42, 95% CI 0.85, 2.37). There was no evidence that the programme had any positive impacts on women's perceived decision-making power within the household on issues related to child nutrition and care. If anything, in rural areas the programme was associated with a decline in mother's involvement in decisions (OR=0.90, 95% CI 0.83, 0.98). There was no evidence of an impact of the programme on labour-force participation or working hours.

The present study suggests that the FA programme increased the use of preventive healthcare services, growth and development check-ups and mothers' participation in educational workshops, particularly in rural areas. The programme increased children's food consumption in both rural and urban areas, as well as dietary diversity among children in rural areas. This suggests that CCT programmes may be efficient in improving child nutrition through growth and development check-ups as well as increasing access to preventive health services. However, the programme had no effects on other important determinants of child health such as women's empowerment, knowledge, attitudes and practices and women's employment rates. These findings cast some doubt on the notion that CCT programmes have 'spillover' effects on broader determinants of child health not directly associated with programme conditionalities. The authors conclude that there is a need to develop CCT or other programmes that not only influence behaviours directly associated with pre-specified conditions, but also motivate households to invest further in other important determinants of child health and wellbeing.

¹ Lopez-Arana S, Avendano M, van Lenthe FJ and Burdorf A. (2016). *The impact of a conditional cash transfer programme on determinants of child health: evidence from Colombia*. Public Health Nutrition: 19(14), 2629–2642 doi:10.1017/S1368980016000240

Drought, conflict and undernutrition in Ethiopia

Summary of research¹

Location: *Ethiopia*

What we know: Conflict and drought can have negative impacts on child undernutrition.

What this article adds: A recent pooled analysis of 231 surveys conducted between 2000 and 2013 (175,607 children age 6 to 59 months) estimated the prevalence of childhood wasting and investigated the effects of drought and conflict on wasting in crisis-affected areas in Ethiopia. Pooled prevalence of wasting was high (11%) with regional variation (21.5% in Somali region), but decreased over the study period from 19.1% in 2000 to 8.5% in 2013. More than half the surveys (61.9%) exceeded the 10% wasting emergency threshold. Compared with areas unaffected by drought, the estimated prevalence of wasting was 34% higher in areas affected by moderate levels of drought, but similar in severely drought-affected areas. This may be explained by early warning systems and the Productive Safety Net Programme that target severe drought areas. No difference in wasting was found between conflict-affected compared to unaffected areas; conflict was short-lived and of low magnitude. Despite progress, a wasting problem persists among children in Ethiopia. Nutrition interventions should include moderate drought areas.

An estimated 50 million children under five years old worldwide had acute malnutrition in 2014 (UNICEF, WHO and World Bank Group, 2015). The burden is particularly heavy in Africa, where conflict, political fragility and drought are prevalent. While the prevalence of child undernutrition has declined in Ethiopia since 2000, stunting and wasting remain a major concern. In 2014, five million children (40% of the child population) were stunted and around one million (9%) were wasted (CSAE, 2014). It is estimated that undernutrition in Ethiopia was responsible for 378,000 child deaths from 2005 to 2009 and cost around 16.5% of the country's gross domestic product (GDP), an estimated US\$4.7 billion in 2009 alone (NEPAD, ECA, and WFP, 2014).

The problem of undernutrition is worse in crisis-affected areas in the country, where food insecurity is heightened due to climate shocks and conflicts. Few studies have been done on the associations between child undernutrition, conflict and drought in East Africa, including Ethiopia. This study estimated the prevalence of childhood wasting and investigated the effects of drought and conflict on wasting in crisis-affected areas in Ethiopia.

A search of the Complex Emergency Database was conducted for nutrition surveys carried out in Ethiopia from 2000 to 2013. Data were extracted on the prevalence of wasting (weight-for-height z-scores below -2) among children aged 6 to 59 months in areas of Ethiopia that had sufficient

data available. Data on any conflict events and episodes of seasonal drought affecting survey areas were extracted from publicly available data sources. Random-effects Bayesian meta-analysis was used to synthesise the evidence. Data were gathered from 231 small-scale surveys with sample sizes ranging from 300 to 1,227 children (total pooled sample 175,607 children). It was found that 26 (11.3%) of the surveys (20,259 children) were conducted in areas affected by conflict in the six months before the surveys, while 155,348 children lived in areas where no conflicts were recorded. Overall, 132 (57.1%) of the surveys were from areas affected by mild to extreme drought three months before the survey implementation month. The pooled numbers of children affected by mild drought were 79,389, moderate drought 13,323 and severe drought 6,583. A total of 76,312 children were living in areas where no episodes of drought were recorded.

Overall, 21,709 children were wasted; estimated pooled prevalence of wasting over the 14-year period was 11.0% (95% credible interval (CrI): 10.3–11.7). A total of 143 of the surveys (61.9%) reported a wasting prevalence of over 10%, exceeding the World Health Organisation (WHO) emergency threshold. The highest regional prevalence was observed in Somali region (21.5%, 2891 children affected). The estimated prevalence of wasting decreased steadily over the study period from 19.1% (2,233 children) in 2000 to 8.5% (817 children) in 2013. Compared with areas unaffected by drought, the estimated prevalence of wasting was 34% higher in areas affected by moderate levels of drought (posterior odds ratio, OR: 1.34; 95% CrI: 1.05–1.72) but similar in severe drought-affected areas (OR: 0.96; 95% CrI: 0.68–1.35). Although the pooled prevalence of wasting was higher in conflict-affected than unaffected areas, the difference was not plausible (OR: 1.02; 95% CrI: 0.82–1.26).

The authors identify factors influencing the decline in the prevalence of wasting in Ethiopia over the study period. From 2000 to 2011, Ethiopia's average GDP grew by over 10% annually and the population living below the national poverty line declined from 44% in 2000 to 30% in 2011. The population consuming less than the minimum dietary energy requirement dropped from 41.9% in 2000 to 33.6% in 2011 and the country achieved the Millennium Development Goal (MDG) target of reducing extreme hunger by half. In addition, Ethiopia launched a national nutrition strategy in 2008 with the aim of improving food and nutrition security.

In 2005, the Ethiopian Government, in collaboration with partner organisations, launched the Productive Safety Net Programme (PSNP) to ensure food supplies to chronically food-insecure areas that are highly vulnerable to climate



WFP/Michael Tewelde

Feeding programme,
Amhara region, Ethiopia

¹ Delbiso TD, Rodriguez-Llanes JM, Donneau AF, Speybroeck N and Guha-Sapir D. (2017). *Drought, conflict and children's undernutrition in Ethiopia 2000–2013: A meta-analysis*. Bull World Health Organ 2017;95:94–102. doi: 10.2471/BLT.16.172700

shocks. Hence, areas affected by severe drought are more likely to benefit from the programme. Furthermore, the country's early warning system, which targets the areas affected by severe drought, may also help mitigate the impact of severe droughts. This may explain the results and underscore the need for interventions to go beyond predefined, severe drought-prone areas, with strengthened early warning systems and interventions that also benefit moderately drought-prone areas.

The study found no evidence of a difference between the prevalence of wasting in areas affected and unaffected by conflict; most of the

conflict events which occurred were short-lived (mostly one day) and of low magnitude (mainly no fatalities). They may therefore not have had a major impact on the nutrition situation.

In conclusion, pooled prevalence indicates a persistent childhood wasting problem in Ethiopia. National nutrition strategies should target areas of persistent undernutrition. Although areas affected by severe drought must remain a national priority for specific targeted actions, nutrition policy should consider interventions that go beyond the predefined, severe drought-prone areas and incorporate areas where moderate droughts occur.

References

- CSAE 2014. *Ethiopia mini demographic and health survey 2014*. Addis Ababa: Central Statistical Agency Ethiopia; 2014.
- UNICEF, WHO and World Bank Group 2015. *Levels and trends in child malnutrition, joint child malnutrition estimates: Key findings of the 2015 edition*. Washington: United Nations Children's Fund, the World Health Organization and World Bank Group; 2015. Available from: http://www.who.int/nutgrowthdb/jme_brochure2015.pdf?ua=1 [cited 2015 Dec 8].
- NEPAD Planning and Coordinating Agency, UN ECA and UN WFP. *The cost of hunger in Africa: social and economic impact of child undernutrition in Egypt, Ethiopia, Swaziland and Uganda*. Addis Ababa: African Union Commission; 2014. Available from: www.uneca.org/sites/default/files/PublicationFiles/COHA%20Abridged%20English_web.pdf [cited 2016 Jan 20].

Does nutritional supplementation for two weeks prevent malnutrition in ill children?

Summary of research¹

Location: DRC, Uganda and Nigeria

What we know: Ill children are at increased risk of malnutrition due to the infection-malnutrition cycle.

What this article adds: Three randomised controlled trials (RCTs) were conducted to test the effect of 14 days of nutritional supplementation for ill children on incidence of malnutrition during one to six months of follow-up. In DRC, 180 non-malnourished children with malaria were given ready-to-use therapeutic food (RUTF) or no supplementation (control). Children in the RUTF group had higher weight gain at 14 days but similar weight gain at 28 days compared to control. In Uganda (n=2,202) and Nigeria (n=2,213) children with malaria, lower-respiratory tract infection (LRTI) or diarrhoea received RUTF, micronutrient powder (MNP) or no supplementation (control). In Uganda, RUTF reduced incidence of acute malnutrition by one third; no reduction was found in Nigeria. No MNP groups showed reduction in malnutrition incidence. One third of MAM cases (only enrolled in Nigeria) developed SAM during follow-up. Combined Uganda/Nigeria analysis showed no significant association between supplementation and reduction of malnutrition, a strong association between incidence of malnutrition and diarrhoea, and a mixed association between incidence of malnutrition and malaria (this may be related to country differences in malaria incidence, testing and treatment approach). Effectiveness of supplementation is context-specific. Supplementation alone is unlikely to be sufficient to prevent acute malnutrition in sick children; a combination of preventive and curative health and nutrition interventions is key.

Background

It is well recognised that ill children are at increased risk of malnutrition through the infection-malnutrition cycle. To prevent malnutrition after infection, the World Health Organisation (WHO) recommends that children are given additional healthy food daily for two weeks following the onset of illness (WHO, 1994). However, this strategy may not be possible in resource-poor settings with constrained food availability. A more effective strategy may be to provide ill children with a high-quality nutritional supplement during convalescence. The aim of this study was to assess the effectiveness of nutritional supplementation to ill children on the incidence of malnutrition in order to inform future nutritional strategies.

Médecins Sans Frontières (MSF) conducted three randomised controlled trials (RCTs) primarily to investigate whether supplementation for 14 days

with ready-to-use therapeutic food (RUTF) reduced incidence of acute malnutrition during six-months follow-up among non-malnourished children aged 6-59 months with malaria and/or lower respiratory tract infection (LRTI) and/or diarrhoea at recruitment, compared to a control group. The secondary objective of the studies was to investigate the effect of multi-micronutrient powder (MNP) versus RUTF. Other objectives were to determine whether the effectiveness of supplementation on malnutrition differed within groups, such as moderately malnourished versus non-malnourished children on recruitment, and effects of supplementation on other anthropometric measurements, morbidity and mortality. A pilot RCT was carried out in the Democratic Republic of Congo (DRC) (Box 1), followed by two larger studies in Uganda and Nigeria (Boxes 2 and 3). The results were then analysed together to draw conclusions.

Comparative and merged analysis

The studies showed different results. In Kaabong, RUTF supplementation for two weeks decreased incidence of malnutrition by more than 30%, yet this effect was not seen in Goronyo. As the methodology of the Kaabong and Goronyo RCTs were almost identical, data from both were combined to increase the power of the analysis (n=3,765). In the combined dataset, incidences of first NNO in the RUTF, MNP and control groups were 0.287 (95%CI 0.245-0.337), 0.298 (95%CI 0.254-0.349) and 0.345 (95%CI 0.297-0.400) respectively. No significant association was found between supplementation and NNO; nor was there a dose-response relationship between number of supplements and incidence of NNO. The merged data did not therefore show effectiveness of supplementation of ill, non-malnourished children for 14 days with RUTF or MNP after an illness in prevention of malnutrition; effectiveness of RUTF in preventing malnutrition found in Kaabong (Box 2) should be interpreted with caution.

A multivariate regression analysis found positive associations between incidence of malnutrition and the study site, total number of allocations (including medical monitoring, treatment of illness and allocations of supplements), having MUAC <125mm, being younger than 24 months, number of diarrhoea episodes, and caregiver occupation. In Kaabong number of malaria events was associated with higher incidence of malnutrition but in Goronyo number of malaria events was associated with a lower incidence of malnutrition. Being breastfed on enrolment was associated with a significantly higher incidence of

¹ Van der Kam S. (2017) Does a short term nutritional supplementation prevent malnutrition in ill children? *Effectiveness of nutritional supplementation (ready-to-use therapeutic food and multi micronutrients) of 2 weeks in preventing malnutrition in children 6-59 months with infection (malaria, pneumonia, diarrhoea)*. PhD Dissertation. Ecole de Santé Publique – Université Libre de Bruxelles.

Box 1 Summary of published results of pilot RCT in Dubié, Katanga region, Democratic Republic of the Congo (DRC)

Dubié is situated in Katanga Province, a forest region of DRC. At the time of the study, a recent conflict had been resolved and food was accessible. An RCT was undertaken on children aged 6–59 months with confirmed malaria who attended an MSF-supported outpatient clinic and received malaria treatment. Children with severe acute malnutrition (SAM) were excluded. Children were randomly assigned to either an RUTF group, receiving daily RUTF for 14 days, or a control group, receiving no supplemental food. Children were weighed at baseline and on days 14 and 28.

A total of 180 children participated in the study; 93 received RUTF and 87 no food supplementation. At day 14, the RUTF group had a significantly higher mean weight gain of 353g compared with 189g in the control group (difference 164 [95%CI 52–277],

$p=0.005$). However, at day 28 there was no statistically significant difference (539g versus 414g, respectively [$p=0.053$]). Similarly, rate of weight gain per kg bodyweight per day was significantly higher at day 14 in the RUTF group (2.4 g/kg per day versus 1.3g/kg per day, $p=0.005$) but at day 28 was not (1.9g/kg per day in the RUTF group versus 1.5g/kg per day in the control group ($p=0.076$)).

There were no significant differences between study groups in the proportion of children reporting fever, diarrhoea or vomiting; however at 14 days the proportion of children with cough was significantly lower in the RUTF group compared to the control (18.2% vs 37.2%; $p=0.006$). A significantly smaller proportion of children from the RUTF group also reported reduced appetite by day 14 compared to the control group; however these differences disappeared by 28 days.

Children receiving RUTF for 14 days after effective treatment for an uncomplicated malaria episode had faster weight gain than children not given supplementation, reducing the period of risk of malnutrition. By day 28 there was no difference between the groups. The positive catch-up in the control group could be due to the relatively stable food security situation at the time and a good overall nutritional situation.

Van der Kam S, Swarthout T, Niragira O, Froud A, Som-pwe ME, Mills C et al. (2012) Ready-to-use therapeutic food for catch-up growth in children after an episode of *plasmodium falciparum* malaria: An open randomised controlled trial. *PLoS One*. 2012; 7(4).

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0035006>

Box 2 Summary of published results of RCT in Kaabong, eastern Uganda

The population of the Kaabong in Karamoja region, eastern Uganda, is semi-pastoral, with low wealth indicators and high food insecurity (58%). An RCT was conducted among non-malnourished children aged 6 to 59 months diagnosed with malaria, diarrhoea, or lower respiratory tract infection (LRTI) presenting at outpatient clinics from March 2011 to April 2012. Children were excluded when they presented with SAM or moderate acute malnutrition (MAM), were exclusively breastfed, had a severe disease, had a sibling enrolled in the study, or were offspring of study staff. Children with signs of severe disease were referred to hospital.

Children were randomised to one of three arms: RUTF, MNP or no supplement (control) for 14 days for each illness and followed up over six months. The primary outcome was the incidence of a first negative nutritional outcome (NNO) during the six-months follow-up. NNO was a study-specific measure used

to indicate MAM or SAM, defined as weight-for-height z score (WHZ) <-2 or MUAC <115 mm, or oedema. 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, 9 (0.4%) died, and 14 (0.6%) were admitted to hospital.

The incidence rates of NNO 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 reduction of 33.3%. The incidence rate ratio was 0.86 (0.61–1.23; $p=0.413$) for MNP versus control and 0.77 for RUTF versus MNP (95% CI 0.52–1.15; $p=0.200$). 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). The proportions of children who died in the RUTF, MNP, and control groups were 0%, 0.8%, and 0.4%.

A two-week nutrition supplementation programme with RUTF as part of routine primary medical care to non-malnourished children with malaria, diarrhoea or LRTI proved effective in preventing malnutrition. MNP, however, was not effective.

For a longer summary see: *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*.

Field Exchange 52, June 2016. p22 www.enmonline.net/fex/52/supplementationchildrenfood

Van der Kam S, Rolls S, Swarthout T, Edvegu-Otelu G, Matsumoto A, Kasujja FX et al. (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 Med*. 2016; 13 (2): e1001951.

<https://www.ncbi.nlm.nih.gov/pubmed/26859481>

malnutrition in Goronyo; however closer examination found increased risk of malnutrition only for children who ceased breastfeeding during the study period. Continuous breastfeeding throughout the follow-up period did not increase the risk of malnutrition compared to non-breastfed children on enrolment.

In the group of participants with MAM on enrolment, the overall incidence of first NNO (equals the incidence of SAM) was 0.685 (95% CI 0.578–0.812) ($n=544$), with no difference between the supplementation groups. The combined MAM mortality rate for the RUTF, MNP and control groups respectively was 5.7, 27.4 and 15.9 deaths per 1,000/year. The difference in the mortality rate between the RUTF and MNP group was significant at 21.7 deaths/1,000/year and an incidence ratio of 0.210 ($p=0.007$).

Discussion

Effectiveness of supplementation appears to be dependent on context, including incidence of morbidity, access to healthcare and food and nutrition security. The fragile food security situation in Kaabong meant supply of nutrients was limited

and supplementation with RUTF was effective; the lack of effectiveness in Goronyo was likely due to high incidence of morbidity, which limited potential for recovery; more than 70% of participants reported at least one new diarrhoea episode, more than 50% a new LRTI episode and more than 50% a new malaria episode. In some circumstances, prevention of morbidity may be more effective in preventing malnutrition than short-term supplementation with RUTF or MNP to all ill children. Prevention of diarrhoea is a priority, involving water, sanitation and hygiene (WASH) programmes. Results regarding malaria were conflicting. In Goronyo the association between higher frequency of malaria events and decreased incidence of acute malnutrition contrasted with Kaabong, where malaria events were associated with increased NNO incidence. One explanation may be the higher frequency of malaria testing and treatment in Goronyo, which in essence resembled seasonal malaria chemoprophylaxis, which may be effective in reducing malnutrition. More research is needed.

The incidence rate of severe malnutrition among participants who were moderately malnourished on enrolment in Goronyo was high: a

third developed severe malnutrition in the study period. The lack of effect of RUTF in MAM cases was likely because the duration and quantity of RUTF were too low to prevent deterioration to SAM and high morbidity prevalence. Supplementation with RUTF showed a trend of decreasing mortality, which requires more investigation with a systematic review of available research. In Goronyo, stopping breastfeeding – rather than the act of breastfeeding – increased malnutrition. This highlights both the protective role of breastfeeding and the need for skilled support to mothers to help sustain breastfeeding in sick children during the complementary feeding period.

The author concludes that convalescence and weight gain after an illness is a multi-factor process and relevant factors in this process should be addressed in combination, such as adequate nutrition, reduction of diarrhoea and malaria, provision of accessible, preventative and curative healthcare, and complementary feeding support.

References

WHO (1994) Food, Water and Family Health : A Manual for Community Educators. Geneva:

Box 3 Summary of published results of RCT in Goronyo, northwest Nigeria

Goronyo is situated in northwest Nigeria; the economy is based on agriculture and trade. The area is less poor than Kaabong in Uganda but has higher rates of morbidity and malnutrition. An RCT was conducted in children aged 6 to 59 months with malaria, diarrhoea or LRTI presenting at an outpatient clinic from February to September 2012. The same criteria for exclusion were used as in the Kaabong study (Box 2), but children with MAM on enrolment were included. Children were randomised to one of three arms: RUTF, MNP or no supplement (control) for 14 days for each illness over six months. The primary outcome was the incidence of first negative nutritional outcome (NNO) during the six-month follow-up. Of the 2,213 randomised participants, 50.0% were female and the mean age was 20.2 (standard deviation 11.2) months; 160 (7.2%) were lost to follow-up, 54 (2.4%) were admitted to hospital and 29 (1.3%) died.

The incidence rates of NNO for the RUTF, MNP, and control groups were 0.522 (95% confidence inter-

val (95% CI), 0.442–0.617), 0.495 (0.415–0.589), and 0.566 (0.479–0.668) first events/y, respectively. The incidence rate ratio was 0.92 (95% CI, 0.74–1.15; $p = 0.471$) for RUTF versus control; 0.87 (0.70–1.10; $p = 0.242$) for MNP versus control and 1.06 (0.84–1.33, $p = 0.642$) for RUTF versus MNP. A sub-group analysis showed no interaction, confounding or difference in effectiveness of supplementation among children who were moderately malnourished compared with non-malnourished at enrolment. The average number of study illnesses for the RUTF, MNP and control groups was 4.2 (95% CI, 4.0–4.3), 3.4 (3.2–3.6), and 3.6 (3.4–3.7). The proportion of children who died in the RUTF, MNP and control groups was 0.8% (95% CI, 0.3–1.8), 1.8% (1.0–3.3), and 1.4% (0.7–2.8).

One quarter of the participants who were moderately malnourished on enrolment improved to non-malnourishment without showing any difference between the supplementation groups (RUTF, MNP and control groups: 25.4%, 25.0% and 27.3%). The incidence of first NNO for children who were moderately

malnourished on enrolment (i.e. those who declined to severe malnutrition) was 0.695, 0.705 and 0.711 respectively for RUTF, MNP and control groups, with no significant reduction in the RUTF or MNP groups.

A two-week supplementation with RUTF or MNP to ill children did not reduce the incidence of malnutrition in this context. The lack of effect may be due to a high frequency of morbidity in the area, which may increase the impact of the illness-malnutrition cycle.

Van der Kam S, Salse-Ubach N, Rol S, Swarthou T, Gayton-Toyoshima S, Jiya NM et al. (2016) Supplementation with ready-to-use therapeutic food or micronutrients for children after illness for prevention of malnutrition: A randomised controlled trial in Nigeria. *PLoS Med.* 2016;13(2):e1001952.

<http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001952>

Diagnostic criteria for severe acute malnutrition among infants under six months of age

Summary of research¹

Location: Kenya

What we know: Diagnosis of acute malnutrition in infants under six months old (U6M) is currently based on weight-for-length z score (WHZ).

What this article adds: Data were analysed from a cohort of infants U6M admitted to Kilifi County Hospital (KCH) in Kenya from 2007 to 2013 to determine the association of anthropometric indexes with risks of inpatient and post-discharge mortality. Among 2,882 admissions, 4.9% died in hospital (half within 48 hours) and 5.3% died within one year of discharge (50% follow-up). Mid upper arm circumference (MUAC) and weight-for-age z score (WAZ) predicted inpatient and post-discharge mortality better than WLZ ($P < 0.0001$). A single MUAC threshold of <11.0 cm performed similarly to age-adjusted MUAC thresholds (all $P > 0.05$) and better than WLZ <-3 for both inpatient and post-discharge mortality (both $P < 0.001$). Height for age (HAZ) performed similarly to WLZ. HIV exposure was associated with inpatient and post-discharge mortality. In conclusion, MUAC or WAZ identify infants U6m at highest risk of death.

Diagnosis of severe acute malnutrition (SAM) in infants under six months of age (U6M) is based on weight-for-length z score (WLZ), using the same thresholds as for older children (WHO, 2013). However, WHZ standards are not available for infants <45 cm in length and there are concerns about the reliability of anthropometric indexes in early infancy. In older children mid-upper arm circumference (MUAC) predicts mortality better than WLZ. Relations between anthropometry and mortality may be confounded by age, HIV and low birth weight. Diagnostic thresholds for WLZ, MUAC and other indexes

have not been fully evaluated against mortality risk among U6M infants. The aim of this study was to determine the association of anthropometric indexes with risks of inpatient and post-discharge mortality among U6M infants recruited at the time of hospitalisation.

Methods

Data were analysed from a cohort of U6M infants (four weeks to six months of age) admitted to Kilifi County Hospital (KCH), Kenya, between January 2007 and December 2013. Post-discharge analysis included the subset of infants discharged alive, resident within the Kilifi Health and De-

mographic Surveillance System (KHDSS) and followed up from January 2007 to March 2014. Primary outcomes were inpatient death and death during follow-up over one year after discharge. Adjusted risk ratios (RRs) were calculated for inpatient mortality and hazard ratios (HRs) for post-discharge mortality for different anthropometric measures and thresholds, including weight-for-age z score (WAZ), length-for-age z score (LAZ), weight-for-length z score (WLZ) and mid-upper arm circumference (MUAC). Discriminatory value was assessed using receiver operating characteristic curves.

Results

A total of 2,882 infants were admitted and included in the initial analysis: 1,730 (60%) were male and the median age at admission was 3.0 months (inter-quartile range (IQR): 1.7–4.5 months). At admission, 642 infants (22%) were wasted (WLZ <-2); 317 (11%) of whom were severely wasted (WLZ <-3) and 962 (33%) were stunted (LAZ <-2). None of the infants had kwashiorkor (oedematous malnutrition); 191 infants (6.6%) had a positive HIV antibody test; 41 (21%) of whom had a WLZ <-3 . A total of 346 infants were excluded from the main analysis because of missing data, mainly because the

¹ Mwangome M, Ngari M, Fegan G, Mturi N, Shebe M, Bauni E, Berkley JA. Diagnostic criteria for severe acute malnutrition among infants aged under 6 mo. *Am J Clin Nutr* doi: 10.3945/ajcn.116.149815.

infant was too sick to measure. Forty-seven infants (14.7%) missing WLZ had a length <45 cm; hence WLZ could not be computed. Adjusted for age and HIV, the relative risks (RRs) of inpatient mortality associated with missing anthropometric indexes were: 3.04 (95% CI: 2.29, 4.04), 5.02 (95% CI: 3.14, 8.00), 3.11 (95% CI: 2.31, 4.19) and 3.56 (95% CI: 2.25, 5.65) for WLZ, WAZ, LAZ and MUAC respectively.

Anthropometry as a predictor of mortality

Overall, 140 of 2,882 infants (4.9%) died during admission. Sixty-nine (49%) deaths occurred within the first 48 hours of hospitalisation. WLZ, WAZ, LAZ and MUAC were all associated with inpatient death even after adjusting for confounders. The current criteria for diagnosing SAM (WLZ <-3) identified 317 infants (11%), of whom 40 (12.6%) died. WAZ identified 630 (21.9%) severely underweight infants, of whom 77 (12.2%) died. MUAC <11.0 cm identified 682 infants (23.7%), of whom 80 (11.7%) died, whereas among the 2,200 infants with MUAC ≥11.0 cm, 60 (2.7%) died. In multivariate analysis, HIV exposure and anthropometric criteria were consistently associated with inpatient mortality. Small size at birth (preterm or low birth weight) was associated with mortality in the WLZ model only.

The adjusted area under the curve (AUCs) for WLZ, WAZ, LAZ, and MUAC were 0.71 (95% Confidence Interval (CI): 0.66, 0.76), 0.76 (95% CI: 0.72, 0.81), 0.73 (95% CI: 0.68, 0.78) and 0.77 (95% CI: 0.73, 0.81) respectively. Compared with WLZ, MUAC and WAZ were better predictors of mortality (both $P < 0.0001$) and LAZ was similar to WLZ ($P = 0.43$).

Effect of age on MUAC criteria

AUCs for MUAC, WAZ and WLZ were plotted by month of age. The point estimates of AUC for MUAC and WAZ were consistently above those for WLZ. Statistically, the optimal MUAC cut-off was 11.2 cm (rounded down to 11.0 cm). However, MUAC thresholds differed with age, indicating that age-varying cut-offs should be investigated. To further understand whether single or varied MUAC cut-offs would best suit this age group, 11.0 cm was chosen as a reference threshold and the diagnostic performance of single and varied MUAC cut-offs were tested against this reference. For the single criterion between <10.0 and <11.5 cm, no difference in the association with the risk of mortality was found. From <11.0 cm; however, differences were found in case load and sensitivity for death. The performance of WAZ criteria of <-2 and <-3 was also no better than the use of MUAC <11.0 cm.

Post-discharge mortality

Of the 2,742 infants discharged alive, 1,455 (50%) lived within the area and were followed up for 12 months after discharge. Fifty infants (3.4%) had unknown outcomes; hence 1,405 were included in the final analysis. During 1,318 child-years of observation, 75 infants (5.3%) died and there was a mortality rate of 57 (95% CI: 45–71) per 1,000 child-years of observation. The median time to death was 91 days (IQR: 40, 165 days). A total of 33 of 75 (44%) and 53 of 75 (71%) deaths occurred during the first three and six months of follow-up. In multivariate analysis, HIV exposure and anthropometric criteria were associated with post-discharge mortality but not size at birth. Compared with WLZ, MUAC and WAZ were better predictors of mortality (both $P < 0.001$), but LAZ was similar ($P = 0.93$).

AUCs for MUAC, WAZ, and WLZ were plotted by month of age. Within each age group, the point estimate AUCs for MUAC and WAZ were consistently above those for WLZ. The statistically optimal MUAC threshold for all infants was <11.5 cm but varied between age groups. The performance of the MUAC cut-off <11.0 cm was tested against other single and varied MUAC cut-offs. For the single criterion between <10.0 and <11.5 cm, no differences in association with the risk of mortality were found from the reference, except for the cut-off <10.0 cm, which had a significantly lower AUC ($P = 0.003$) than the reference. In all groups, differences in case load and sensitivity for death were noted. WAZ thresholds were not superior to MUAC <11.0 cm.

Discussion and conclusions

Among hospitalised infants U6m, malnutrition is common and is associated with inpatient and post-discharge mortality. MUAC and WAZ are better predictors of mortality than WLZ. A single MUAC threshold of <11.0 cm performed similarly to age-adjusted MUAC thresholds that varied with age (all $P > 0.05$) and performed better than WLZ <-3 for both inpatient and post-discharge mortality (both $P < 0.001$). Reported small size at birth did not reduce the risk of death associated with anthropometric indexes.

To treat acute malnutrition in U6M infants, WHO currently recommends re-establishing exclusive breastfeeding; this is not a malnutrition-specific intervention and most admitted sick infants would benefit. Successfully re-establishing exclusive breastfeeding in an inpatient setting is a labour intensive and time- and resource-consuming activity. Furthermore, for those who are too sick or unable to breastfeed for another reason, dilute F-100 or formula milk may be needed. The proposed cut-offs can be used to identify infants for whom potentially scarce resources can be prioritised. Further research into the effectiveness of potential interventions is required.



Measuring infant length, Kilifi County Hospital, Kenya

Child outcomes of cash transfer programmes in humanitarian and development contexts

Summary of research¹

WFP/Georgina Goodwin

Location: *Global*

What we know: Cash transfer programmes (CTPs) have a proven impact on poverty reduction and social protection but their overall impact across a range of child outcomes is unknown.

What this article adds: A systematic review was undertaken of 131 studies between 2012 and 2016 on the impact of CTPs on child outcomes in health, food security, nutrition, protection and education. Most evidence is from development contexts. Overall it appears that CTPs significantly and positively contribute to child survival, education and child protection with highest impact in areas directly affected by cash; there is less proven and consistent impact at a higher level and on more complex outcomes, such as child anthropometry. There are examples of significant impact on maternal knowledge around infant and young child feeding (IYCF) (when combined with nutrition counselling); reduced severe stunting and severe wasting in children aged 2-9 years; reduced stunting in children whose mothers have secondary education and in children whose households have access to clean water; and increased diet quantity and meal frequency. Evidence is lacking for other child growth indicators. More evidence is needed across the range of CTP modalities to compare their relative impact; more evidence is also needed from humanitarian programmes. Key recommendations include mapping pathways to child outcomes to reach higher-level indicators; combining CTPs with complementary programmes; accommodating the needs and capacities of beneficiaries; ensuring supply-side factors are functioning; and improving monitoring of child outcomes across CTP modalities to increase the evidence base.

The use of cash transfer programmes (CTPs)² has increased in recent years to become an integral part of poverty reduction and social protection strategies in the developing world. Substantial evidence has been generated over the last decade on the effectiveness of cash transfers; however there has been no comprehensive, overall assessment of key outcomes for children in either humanitarian or development contexts. This systematic review attempts to fill this evidence gap by reviewing research on a broad list of indicators around outcomes for children in health, food security, nutrition, protection and education between 2012 and 2016. In this review, CTPs may include unrestricted and restricted unconditional cash transfers (UCTs), unrestricted and restricted conditional cash transfers (CCTs) and labelled cash transfers (those that come with 'soft' restrictions rather than obligations). Complementary programmes involving cash are also considered.

A total of 4,800 initial studies were identified, then narrowed down to 131 for final analysis. Out of these, 115 were from a development

context and 16 were from a humanitarian context; geographically, 15 were from multiple regions, 56 from Sub-Saharan Africa and North Africa, 32 from Central and South America, 13 from South Asia, one from Central Asia, eight from East Asia and seven from the Middle East; 18 were systematic reviews, meta-analyses and literature reviews; and 113 were individual studies. With regard to CTP modalities, 73 studies evaluated unrestricted CCTs; 70 evaluated unrestricted UCTs; six evaluated restricted CCTs; 12 evaluated restricted UCTs; and five evaluated labelled UCTs.

Overall, CTPs appear to significantly and positively contribute to child survival, education and protection. There is most evidence of a positive impact on areas directly influenced by an influx of cash, such as school attendance, food consumption and use of preventative healthcare services. There is less evidence of consistent, positive impact on higher-level and more complex outcomes, such as child anthropometry.

In terms of nutrition and food security indicators, there is evidence that, when combined

with nutrition counselling, unrestricted CTPs lead to increased maternal knowledge around infant and young child feeding (IYCF), although this does not necessarily lead to improved IYCF practices. None of the evidence included in the review reports significant impacts of CTPs on several indicators of child growth (height-for-age for children aged 0-5 years and weight-for-height and weight-for-age for children aged 0-14 years). However, there is evidence of a significant decrease in severe stunting and severe wasting in children aged 2-9 years, a significant decrease in stunting for those children whose mothers have secondary or high school education, and a decrease in stunting for children whose households have access to clean water.

There are mixed impacts on the incidence of anaemia for children under six years old. There is evidence that CTPs lead to a significant increase in diet quantity and meal frequency; however impact on diet diversity indicators is mixed.

To have a greater positive effect on higher-level outcomes, CTPs must be designed to target key factors in the theory of change of each outcome. For example, IYCF practices must be targeted to have an impact on child anthropometry and must be combined with other interventions, such as promotion of improved IYCF practices. Factors that can limit the impact of CTPs include limitations in programme design, such as insufficient value of the cash transfer, and poor availability or poor quality of commodities and services that contribute to meeting certain outcomes, such as healthcare services and drinking water.

Overall, variations in the CTP modality do not play a significant role in influencing outcomes for children. However, imposing conditions and/or restrictions around the transfers does appear to generate significant positive impacts on child health-seeking behaviours, schooling outcomes and early marriage and pregnancy. In these cases, cash seems to act as an incentive for recipients to adopt specific behaviours, although it is unclear from the research if it is the transfer itself or the condition imposed that leads to the behaviour change. It is also worth noting that a particular form of CCT – cash-for-work – appears to have a significant impact in an undesired direction, leading to an increase in child labour, although it may help mothers to avoid having to migrate for work and thereby increase the time they spend caring for their children, including breastfeeding their infants.

Conclusive statements about the relative efficacy of different CTP modalities cannot be made as much more evidence is available on unrestricted CCTs than on the other modalities and there is little evidence comparing modalities

¹ Mishra A. (2017) *Child outcomes of cash transfer programmes: What works and what doesn't for children in humanitarian and development contexts*. Save the children research brief. www.cashlearning.org/downloads/research-brief-ctp-childoutcomesfinal.pdf

² CTP refers to all programmes where cash or vouchers are provided directly to beneficiaries.

within the same programme. In terms of value for money, conditions and restrictions will often involve higher implementation and administrative costs, both for the implementing organisation and recipients, and therefore should be weighed against their potential impact.

There is much more evidence of the impact of CTPs on child outcomes in development contexts than humanitarian contexts. Conclusions must be applied to humanitarian contexts with caution, although evidence so far suggests there is relatively little difference in the pattern of cash transfer impacts between the two contexts.

Considerations for humanitarian contexts may include restricted availability of commodities and services and child protection issues.

The author provides the following recommendations based on review findings:

- Map pathways to child outcomes in the design of CTPs and consider using CTPs in combination with other programmes and only when economic barriers are identified as a major obstacle.
- Consider the needs or capacities of the beneficiary group when selecting CTP modality and appropriate frequency of grants.

- Ensure that relevant supply-side factors are available and functioning.
- Ensure fair and transparent targeting of beneficiaries, timely and regular payments and removal of administrative barriers to delivering/receiving cash transfers.
- Monitor outcomes for CTPs for children of different ages and sexes and consider using standard indicators across different modalities to help compare their relative effectiveness.
- Be aware of the limitations of cash programmes, which may not be the most suitable programme choice for all child outcomes.

Methods to detect cases of severely malnourished infants under six months

Summary of research¹

Location: *Global*

What we know: The World Health Organization (WHO) recommends weight-for-length z score (WLZ) as an anthropometric indicator to identify severe acute malnutrition (SAM) in infants <6m.

What this article adds: A review was undertaken of recent evidence of methods for detecting acute malnutrition in infants <6m to assess their ability to reflect both mortality risk and nutritional status in this age group. Clinical and anthropometric methods were assessed against 11 criteria (simplicity; acceptability; cost; precision; accuracy; sensitivity; specificity; predictive value; objectivity; quantitativeness; and independence of age). Weight-for-age (WFA), mid-upper-arm circumference (MUAC) and MUAC-for-age (MUAC/A) were rated the best indicators of acute malnutrition and associated mortality in this age group, based on current evidence. MUAC/A compared to MUAC with a single cut-off (<11cm) does not add to sensitivity, specificity or predictive value. WFA may be useful in certain community settings where weight measurements are taken routinely. WFL scored poorly in terms of simplicity, acceptability, cost, accuracy and poorer predictive value for mortality; difficulties in accurately measuring length in the age group are also an important constraint. The review proposes MUAC and WFA alongside simple clinical indicators should be used to identify acute malnutrition in infants <6m, including infants born small or pre-term. Priorities for future research include a formal evaluation of the community management of uncomplicated acute malnutrition in infants < 6 months of age (C-MAMI) tool and assessment of MUAC and WFA at scale in the community in this age group.

World Health Organisation (WHO) guidelines currently recommend using weight-for-length z-scores (WLZ) to diagnose severe acute malnutrition (SAM) in infants less than six months old (infants <6m). However, this recommendation is based largely on convention of diagnosis in older children rather than scientific evidence. Guided by an existing review of children aged 6-59 months (Myatt et al, 2006), this paper examines recent evidence to evaluate possible methods for detecting acute malnutrition in infants <6m in community and healthcare settings. The review assessed clinical and anthropometric ability to reflect both mortality risk and nutritional status in this age group. Methods were scored

against 11 criteria: simplicity; acceptability; cost; precision; accuracy; sensitivity; specificity; predictive value; objectivity; quantitativeness; and independence of age. Indicators were identified from a 2012 systematic literature review for admission and discharge criteria for this age group (Kerac et al, 2012) and papers published since 2012 or in press, found in a search of PUBMED and through personal communications with authors.

Results

The literature highlighted the following indicators for infants <6m: weight-for-length (WFL); weight-for-age (WFA); length-for-age (LFA), mid-upper arm circumference (MUAC), MUAC-for-age (MUAC/A) and clinical indicators, such



Measuring MUAC of an infant, Kilifi County Hospital, Kenya

as the infant being too weak to suckle effectively and breastfeeding issues (or 'maternal milk insufficiency' (MMI)). Findings against each of the 11 criteria were as follows:

Simplicity

Clinical assessment methods vary in their simplicity; assessment of infant suckling takes patience and training, whereas MMI relies on mother's reporting. A new tool, community management of uncomplicated acute malnutrition in infants < 6 months of age (C-MAMI)²,

¹ Lelijveld N, Kerac M, McGrath M, Mwangome M, Berkley J. (2017) A review of methods to detect cases of severely malnourished infants less than 6 months for their admission into therapeutic care.

² <http://www.ennonline.net/c-mami>

provides a simple form of clinical assessment, preferred by basic health staff. Assessment of age in infants <6m appears to be more reliable than that for older children; however formal evaluation of this is needed. Pre-term or low birth weight infants are more likely to be identified as malnourished, which may lead to unnecessary intervention; however elevated risk of mortality in this age group means they should be equally included in nutrition interventions (Mwangome et al, 2017).

Mothers and health workers can find the process of measuring length in the <6m age group difficult, whereas weight measurements are routine, more acceptable and scales are more likely to be available. Calculating z-scores or using look-up tables is complex for healthcare staff, particularly for WFL, which requires use of different length and height tables. MUAC may be a simpler indicator as no z-scores are required and minimal equipment and training are needed.

Acceptability

The presence of a male health worker and/or insufficient privacy reduce the acceptability of breastfeeding assessment tools to carers; assessments that rely on questions alone rather than observations may be more acceptable. Carers and infants can become distressed during both length and weight measurements and the handling of heavy, bulky length boards reduces the acceptability of length assessments for health workers. MUAC for infants <6m may be more acceptable to carers and operators as the infant can remain dressed, stay in their carer's arms, the mother can take the measurement and MUAC tapes are highly portable.

Cost

Some breastfeeding assessment tools are costly in terms of personnel, equipment and time, although other, simpler tools require less training, including the clinical assessment section of the C-MAMI tool. Hanging spring scales cost less than other scales and are routinely used in community programmes; length boards may prove too costly for some programmes. MUAC is likely to be the least costly assessment method as the equipment required is cheap (£0.30) and minimum training is required.

Objectivity and quantitiveness

Clinical assessment is generally considered to be subjective and difficult to standardise and express quantitatively, whereas anthropometric indicators are generally regarded as objective and quantitative. Simple, low-cost and objective methods may be most useful for community frontline screening.

Independence of age

Earlier studies found MUAC to be relatively independent of age in older children but less so in infants under one year old. However, a recent study in Kenya found that a single MUAC threshold of <11cm performed similarly to MUAC/A in predicting mortality in infants <6m (Mwangome et al, 2017). The same study also found that WFL, WFA and LFA were associated with age in infants <6m.

Precision and accuracy

Both accuracy and precision of age have been highlighted as questionable among older children but have not been assessed in infants <6m. Weight using hanging scales with 100g graduation units may not be accurate enough for this age

group, although this needs formal assessment. Studies show that accuracy of weight can be greatly influenced by clothing. Health workers appear to make fewer mistakes using MUAC compared to WFA and WFH for older children and may under-diagnose infant malnutrition when using WFL. Reliability of z-score calculations and infant anthropometry data can be low, with more missing data values and errors compared to older children.

Sensitivity, specificity and predictive value

Evidence suggests that existing breastfeeding assessment tools would be neither sensitive enough for outpatient care nor specific enough for inpatient care. Further studies are needed to identify standardised breastfeeding indicators which correctly capture mother's concerns, as these are likely to be sensitive and predictive. One study in Kenya found that a MUAC cut-off of <11cm identified 24% of hospitalised infants at risk of inpatient mortality with a sensitivity of 70% and specificity of 68%, compared to WFA <-3 z-score, which was less sensitive (55%) but more specific (80%). In terms of predictive value, MUAC and WFA were found to be better at predicting mortality compared to WFL and LFA in an inpatient setting (Mwangome et al, 2017). Other studies support the greater predictive value of WFA compared to WFL and LFA. Another study in Kenya showed no significant difference in predictive value when using a combination of MUAC and/or WFA compared to MUAC alone, although WFA identified additional infants with high case fatality (Mwangome et al, 2017a).

Despite relatively low prevalence, checking for kwashiorkor should be included as an additional indicator of SAM in infants <6m as checking is simple, acceptable, low cost, largely objective and independent of age.

Conclusions

Based on current evidence, the best indicators of acute malnutrition and associated mortality in infants <6m appear to be WFA, MUAC and MUAC/A. A fixed MUAC cut-off rate has the additional benefit of not depending on age, which can add inaccuracy. WFA suffers from the potential imprecision of cost-effective scales; however overlap of weight measurements with other routine health checks makes WFA feasible in many settings. WFL, although the current recommended indicator, scored poorly in this review, largely due to inaccuracy, difficulties associated with measuring length and poorer predictive value for mortality. The authors recommend MUAC and WFA, alongside simple clinical indicators and identification of kwashiorkor, as standard indicators for acute malnutrition in infants <6m, including infants born small or pre-term.

Priorities for future research include a formal evaluation of the C-MAMI tool and an assessment of the use of WFA and MUAC at scale in the community for infants <6m, taking into account use of different weighing scales and accuracy of age calculations.



Weighing an infant at a UNICEF-supported outpatient therapeutic centre in Kabasa IDP camp, Dolow, Somalia

A review of barriers to and enablers of nutrition policy change

Summary of research¹Location: *Global*

What we know: Public policy change is needed to improve the nutrition status of populations globally; very little literature exists on what is necessary to enable nutrition policy change.

What this article adds: A recent review of existing systematic data examined enablers of and barriers to public nutrition policy change in high-income, democratic countries. Sixty-three studies were included on policy-making in public health nutrition in international, national, state and local settings. Two overarching themes were identified: political will (the extent to which decision-makers were supportive of policy change) and public will (the mood and policy preferences of voters). Barriers to policy change were the rise of neoliberal ideology; pressure from industry; lack of knowledge, skills and resources on the part of health advocates; and government silos. Enablers of policy change were developing a well thought-through solution; building relationships with key stakeholders; using emotions and values; being visible; engaging a policy entrepreneur; and understanding the policy-making process.

Improving the nutrition status of populations remains an urgent priority for both over and undernutrition. Recent papers advocate that the most effective way of achieving this is to promote and implement public policy change through regulation, legislation and public awareness campaigns to encourage healthy food choices (Roberto et al, 2015; Hawkes et al, 2015). However, changing public policy is slow and challenging due to process complexity and the conservative nature of political systems, which favour the status quo. For change to occur, the power of vested interests must be challenged and the policy problem, policy solution and political climate must align (True, Jones & Baumgartner, 1999; Kingdon, 1995). Limited peer-reviewed literature exists on effective advocacy strategies for influencing public health policy in general, with even less on influencing public health nutrition policy. This paper aims to fill this gap by considering real-world factors and practical experiences of past advocacy efforts to identify and synthesise barriers to and enablers of policy change in the field of nutrition in high-income, democratic countries.

The review reanalysed the results of a previous systematic literature review (Cullerton et al, 2015). Studies examining policy-making in public health nutrition in international, national, state and local settings in high-income democratic countries were identified and an interpretive synthesis was undertaken. A total of 63 studies were included.

Findings

Numerous topics were identified under the theme of political will (whether decision-makers – politicians or senior bureaucrats – were supportive of policy change). A second major theme, public will, reflects the mood and policy preferences of voters. Public will underpinned political will; politicians were often not motivated to act on an issue that had little public interest or could cause a backlash from wider society. Four barriers to policy change emerged:

Influence of neoliberal ideology: This involves the prioritisation of economic prosperity in policy decisions. Papers pinpointed a lack of support for regulatory intervention (which can interfere with market-driven economies) and concerns about the cost of implementing proposed solutions and monitoring compliance. This was problematic for many public health nutrition initiatives as evidence around cost-effectiveness did not exist or was difficult to determine due to the complexity and multifactorial nature of nutrition problems. Government policies that resulted in short-term economic benefit were prioritised over policies related to longer-term health outcomes.

Pressure from industry: This came in various forms, including intense lobbying. Lobbyists are ever present and more vigilant than public interest groups (Dodson et al, 2009). Industry deliberately creates scientific uncertainty around issues, such as claiming insufficient evidence on effective interventions. Industry also influences cultural norms by investing considerable resources to control how nutrition problems and solutions are framed.

Limited resources, money and time of health advocates: Volunteer health advocates felt at a distinct disadvantage against full-time, paid lobbyists, having less time and money to directly lobby decision-makers and less understanding of policy and political processes. Often health advocates failed to communicate effectively with policy-makers; for example by providing reams of evidence or using complex language rather than concise, targeted communications.

Government silos: Government responsibility for dietary intake is spread across different government departments that work in 'silos' and prioritise their own objectives; this challenges coordination and effective advocacy interventions.

Enablers that improve the likelihood of positive policy change for improved nutrition were:



Gambella, Ethiopia, 2016

Well thought-through solutions: The most successful solutions had clear, costed strategies on how to solve the problem, single or incremental strategies and a local focus.

Build relationships with and gain support from a wide range of policy-makers and stakeholders: This can generate diverse and well-connected coalitions that strengthen the voice on an issue and provide a more powerful influence. Non-traditional alliances were useful in this respect; for example, agricultural and producer interests.

Use of emotions and values: While evidence is important, the use of stories and emotions to engage values can be compelling. The most effective framing relied on simple messages that were easy for the general public and politicians to grasp.

Visibility: To be effective, advocates must first have their issue acknowledged by policy-makers as a problem worthy of attention. This requires high-level communication skills and creative solutions. Several studies found that attendance by policy-makers at a high-profile event or their reading of a key report triggered policy action. Frequent media engagement with the media and mobilisation of wider society was also important. Many studies highlighted the effectiveness of using a 'policy entrepreneur' (for example, a local government chief executive or politician) as a conduit for disseminating evidence to legislators and promoting recommended strategies. This also increased visibility and improved political will.

Understanding the policy-making process: The review found that solutions needed to be politically palatable by aligning to at least one goal of government and the prevailing ideology and decision-makers needed to be strategically targeted. Advocates needed to be 'nimble' by understanding how and when the processes of problem recog-

¹ Cullerton K, Donnet T, Lee A and Gallegos D. (2016). Playing the policy game: a review of the barriers to and enablers of nutrition policy change. *Public Health Nutrition*: 19(14), 2643–2653 doi:10.1017/S136898001600067

... nition, policy development and political decision-making converge to jump in the 'policy window'. If all else fails, three papers identified threatening corporations with litigation as a powerful, last-resort strategy.

There is a common belief that policy-making is a rational process in which evidence is used to assess the relative costs and benefits of options. However, evidence is only one component of influence; it also requires political and often public will for the proposed policy problem and solution. The suite of enablers presented in this paper can be used by public health professionals to influence political and public will in future advocacy efforts.

References

- Cullerton K, Donnet T, Lee A et al. (2015) *Using political science to progress public health nutrition: a systematic review*. Public Health Nutr (Epublication ahead of print version).
- Dodson EA, Fleming C, Boehmer TK et al. (2009) *Preventing childhood obesity through state policy: qualitative assessment of enablers and barriers*. J Public Health Policy 30, Suppl. 1, S161–S176.
- Hawkes C, Smith TG, Jewell J et al. (2015) *Smart food policies for obesity prevention*. Lancet 385, 2410–2421.
- Kingdon J (1995) *Agendas, Alternatives, and Public Policies*. New York: HarperCollins.
- Roberto CA, Swinburn B, Hawkes C et al. (2015) *Patchy progress on obesity prevention: emerging examples, entrenched barriers, and new thinking*. Lancet 385, 2400–2409. 2.
- True JL, Jones BD & Baumgartner FR (1999) *Punctuated equilibrium theory: explaining stability and change in American policymaking*. In Theories of the Policy Process, pp. 97–115 [P Sabatier, editor]. Boulder, CO: Westview Press. 4.

MUAC vs WHZ in predicting mortality in hospitalised children under five years of age

Summary of research¹

Location: *India*

What we know: Both weight-for-height z score (WHZ) and mid-upper arm circumference (MUAC) identify children at increased risk of death.

What this article adds: A diagnostic test accuracy study was carried out in a paediatric emergency department in India to determine the performance of MUAC compared with WHZ as a predictor of mortality among children aged 6–59 months (n=1,663). MUAC < 11.5cm, WHZ<−3 and weight-for-age z-score (WAZ)<−3 all independently predicted inpatient mortality. However, MUAC was a significantly better predictor of mortality than WHZ, WAZ and height-for-age z-score (HAZ) in these hospitalised sick children. Using MUAC <11.5cm as the sole criterion misses one third of children at risk of dying but identifies those most at risk of death; risk of death in children with MUAC<11.5cm was more than twice the risk than for children with WHZ<−3 and MUAC>11.5cm. MUAC of <11.5cm is suggested as a priority indicator to triage children for therapeutic interventions in resource-limited settings..

In hospitalised Indian children, malnutrition increases six-fold the risk of mortality associated with both diarrhoea (Behera et al, 1980) and acute respiratory tract infections (Sehgal et al, 1997). Weight-for-height z score (WHZ) for identification of SAM has practical challenges, including difficulties in accurately weighing and measuring length in sick children; unavailability of calibrated weighing scales and height boards; the need for reference charts; and the complex calculations to derive and interpret WHZ. Recognising these operational difficulties, mid-upper arm circumference (MUAC) <11.5cm is recognised internationally as an age- and sex-independent diagnostic criterion for SAM, alongside WHZ<−3. However, WHZ and MUAC often do not identify the same children. In addition, very few studies have directly compared MUAC<11.5cm with WHZ<−3 for predicting child mortality. The purpose of this study was to determine the performance of MUAC compared with WHZ for predicting deaths among hospitalised children aged six months to five years in Indian settings

and to determine the optimum cut-off value of MUAC to predict mortality in these children.

Method

The authors used a diagnostic test accuracy study in a paediatric emergency department of a tertiary care hospital catering to a semi-urban and rural population in Delhi, India. Hospitalised children aged six months to five years were consecutively recruited over 14 months. Children admitted for diagnostic purpose with obesity, congenital anomalies, gross ascites, generalised anasarca, non-nutritional short stature and for whom outcome on discharge could not be recorded (left against medical advice, referred to other hospitals) were excluded after thorough clinical examination.

MUAC (cm), weight (kg), height (cm), clinical details and the outcome were recorded. MUAC was measured with a non-stretchable Teflon measuring tape. Infants were weighed on a pan-type of digital weighing scale; older children who could stand by themselves were weighed



Mother and child in India, 2008

WFP/Rein Skallerud

on a platform-type weighing scale. Length was measured in children less than two years old using an infantometer; standing height was measured for children more than two years old on a stadiometer. MUAC was compared with WHZ based on the 2006 WHO growth standards for predicting the outcome. Receiver operating characteristic (ROC) curves were constructed to ascertain the predictive values of MUAC, WHZ, weight-for-age z score (WAZ) and height-for-age z score (HAZ) for inpatient mortality in terms of area under the curve (AUC) with 95% confidence interval (CI). Areas under ROC curves were compared using the χ^2 test and multiple pairwise comparisons were done, with $P<0.01$ considered significant.

Results

Of 2,389 children aged six months to five years hospitalised during the study period, 1,959 (82.0%) were eligible for inclusion. Of the 1,663 children finally included, 24.5% (n=407) were infants aged 6–11 months. The median age of the study population was 23 months.

The most common diagnoses on admission were seizure disorder (32.1%, $n=533$), pneumonia (19.4%, $n=323$) and diarrhoea (12.4%, $n=206$). Others included nutritional anaemia (4.6%, $n=77$), meningoencephalitis (6.4% $n=106$, 6.4%), poisoning (5.5%, $n=92$), septicaemia 2.9%, $n=48$), infection (malaria and dengue fever (1.6% each, $n=26$ each), enteric fever (1.5%, $n=25$) and tuberculosis ($n=26$, 1.6%).

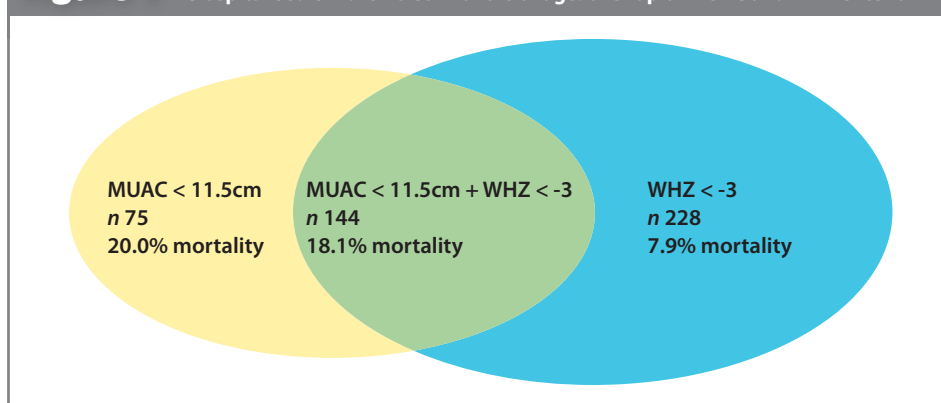
Mean WHZ, WAZ and HAZ for the enrolled children were -1.5 (SD 2.0), -2.2 (SD 1.6) and -1.9 (SD 1.7), respectively. Overall, 849 (51.1%) children were underweight, 788 (47.4%) were stunted and 643 (38.7%) were wasted. Severe underweight, severe stunting and severe wasting were present in 482 (29.0%), 420 (25.3%) and 372 (22.4%) children, respectively.

The median MUAC was 13.0 (IQR 12.2–14.0) cm. MUAC<11.5cm was seen in 219 (13.2%) children; of these, 75 (34.3%) had MUAC<11.5cm but WHZ ≥ -3 , while 144 children (65.7%) had both WHZ< -3 and MUAC<11.5 cm (see Figure 1). Sixty-one per cent ($n=228$) of children with WHZ < -3 had MUAC ≥ 11.5 cm. Only 17 children had oedematous malnutrition.

Seven per cent ($n=124$) of children died during the study. Children who died had significantly lower values for MUAC, head circumference, body mass index (BMI), WAZ and HAZ. The mortality percentages for MUAC<11.5 cm, severe wasting and severe stunting were 18.7% (41/219), 11.8% (44/372) and 8.1% (34/420), respectively.

MUAC < 11.5cm (adjusted OR (95% CI): 3.7 (2.43, 5.60), $P<0.001$); WHZ< -3 (2.0 (1.37, 2.99), $P<0.001$) and WAZ< -3 (adjusted OR=1.602; 95% CI 1.096, 2.340; $P=0.015$) served as independent predictors of inpatient mortality.

Figure 1 Hospitalised children 6-59 months of age: overlap of MUAC and WHZ criteria



However, MUAC was a significantly better predictor of mortality with AUC=0.698 (95% CI 0.650, 0.746), compared with AUC=0.541 (95% CI 0.480, 0.602) for WHZ, AUC=0.574 (95% CI 0.520, 0.629) for WAZ and AUC=0.562 (95% CI 0.513, 0.611) for HAZ. There was no significant difference among the AUC of WHZ, WAZ and HAZ (P value: HAZ v. WAZ= 0.68, HAZ v. WHZ=0.60, WAZ v. WHZ=0.04).

Although the sensitivity and specificity of MUAC<11.5 cm and WHZ< -3 for children at risk of dying appeared roughly similar, the sets of children identified by these nutritional indices differed, with only partial overlap (see Figure 1). The risk of death in children having MUAC<11.5cm was more than twice the risk in children having WHZ< -3 and MUAC>11.5cm. Combining MUAC<11.5cm with WHZ< -3 did not significantly improve the diagnostic performance of MUAC<11.5cm. On balance, MUAC of <11.5cm had the best combination of sensitivity and specificity (sensitivity 33.0%, specificity 88.4%) for predicting inpatient mortality.

Discussion

In this study among hospitalised children aged six months to five years, MUAC was found to be a significantly better predictor of mortality compared with WHZ< -3 . WAZ was also identified as an independent predictor of mortality. MUAC <11.5cm and WHZ < -3 identify different sets of children with only partial overlap; using MUAC <11.5cm as the sole criterion missed one third of children at risk of dying but identified those at higher risk of mortality. The authors conclude that MUAC <11.5cm should be used to triage children for therapeutic interventions in resource-limited settings and that more focused studies are needed to identify anthropometric predictors of short-term mortality in children.

References

- Behera SK, Mohapatra SS, Kar S et al. (1980) Incidence and mortality of hospitalized diarrhea cases. Part III. Indian Pediatr 17, 607–612.
- Sehgal V, Sethi GR, Sachdev HP et al. (1997) Predictors of mortality in subjects hospitalized with acute lower respiratory tract infections. Indian Pediatr 34, 213–219.
- Deivanayagam N, Neduncheli

Financing the sustainable scale-up of CMAM in high-burden countries

Summary of research¹

Location: *Global*

What we know: Investment in the scale-up of community-based management of acute malnutrition (CMAM) is needed to reduce global prevalence of acute malnutrition.

What this article adds: A discussion paper examined case studies of Nepal and Kenya to provide key lessons on the scale-up of CMAM and explore sustainable financing. Progress has been made in both countries due to political and public health prioritisation by government, increased policy commitment to tackling nutrition, Ministry of Health engagement and CMAM integration into health systems, multi-sector coordination, improved financial arrangements (specific budget lines) and government ownership of costs. Financial sustainability requires domestic ownership of CMAM, lower therapeutic food costs and investment in comprehensive prevention strategies. Government and donor funding remains inadequate and must triple to achieve global wasting targets by 2025; innovative funding mechanisms are also needed to fill the current US\$900 million-a-year funding gap.

Background

In 2015, acute malnutrition threatened the lives of 50 million children under five years of age globally (UNICEF, WHO and World Bank Group, 2016). Severe acute malnutrition (SAM) is responsible for an estimated one million deaths annually (WHO, WFP, UNNSCN and UNICEF, 2007). Investment in the community-based management of severe acute malnutrition (CMAM) approach has seen treatment services spread to 80 countries and the number of children treated

¹ Wijeratna A. (2017). *Financing the sustainable scale-up of CMAM in high-burden countries with case studies from Nepal and Kenya*. Discussion paper, March 2017. Action Against Hunger, International Medical Corps and Global Health Advocates.

triple from one million in 2009 to 3.2 million in 2015 (UNICEF, 2015). Despite this, global wasting prevalence levels remain high and rapid investment and scale-up is needed to further treat and prevent acute malnutrition. Donors and governments of countries affected by high wasting rates currently spend only tiny amounts on CMAM; high costs and lack of sustainable financing are significant barriers to wider scale-up. This discussion paper examines the experiences of Nepal and Kenya, who have both made efforts to scale up CMAM, and explores the wider issues of sustainable financing of CMAM to help tackle childhood wasting by 2025.

Key success factors in Nepal and Kenya

Nepal has expanded from CMAM pilots in six areas with high levels of acute malnutrition in 2008 to plans to cover the 35 most affected areas by 2017. Kenya has rolled out CMAM (known in the country as integrated management of acute malnutrition (IMAM)) in badly affected areas since 2008 and is aiming for coverage across the whole country through support for a package of 11 high-impact nutrition interventions (HiNi). The authors identified the following key success factors in Nepal and Kenya:

High political and public health priority: Increased high-level political will from the Prime Minister's office has galvanised the adoption of CMAM in Nepal. In Kenya, leadership by the First Lady and national nutrition patron has kept malnutrition high on the political agenda.

Increased policy commitment to tackling nutrition: Nepal has shown leadership in developing policy targets and commitments to tackling child wasting and nutrition in its comprehensive Multi-Sectoral Nutrition Plan (MSNP) from 2012. Kenya has developed a comprehensive National Nutrition Action Plan (NNAP), which runs until 2017.

Ministry of Health support and integration into existing health systems: Nepal's MSNP calls for management of SAM and moderate acute malnutrition (MAM) to be fully integrated into routine health services and the Ministry of Health and Population has trained health volunteers and workers in CMAM at district and community levels. In Kenya, the Ministry of Public Health and Sanitation championed IMAM and its protocols have been integrated into Kenya's Essential Package for Health.

Box 1 Recommendations

All high-burden countries:

- Establish specific nutrition budget lines and increase national budget allocations to enable nationwide CMAM scale-up.
- Target at least 3% of relevant national budget towards tackling nutrition.
- Invest in strengthening health systems and include nutrition as part of a basic health package.

Kenya:

- Intensify financial commitment for nationwide CMAM scale-up through HiNi.

Nepal:

- Revitalise parliamentary, cabinet and high-level nutrition and food security committees to deepen national ownership of the MSNP.

All donors:

- Triple financial commitment to nutrition over ten years and increase multi-year funding for CMAM scale-up.

- Redirect support for CMAM scale-up towards countries with high wasting burdens.
- Improve quality of reporting to increase transparency and better track CMAM.
- Invest in health systems strengthening and the inclusion of nutrition treatment of SAM within a basic healthcare package of services.

EU:

- Develop a specific target to treat and prevent wasting in children under five years old in development contexts by 2025.
- Pledge an additional €1 billion for multi-year, nutrition-specific interventions, including CMAM, by 2020.
- Ensure humanitarian support for CMAM interventions is multi-year and fully integrated with wider development objectives.

EU & US:

- Improve the level of detail available in the 'long descriptions' of nutrition/ acute malnutrition projects on the creditor reporting system (CRS).

Multi-sectorial coordination: Multi-sector coordination of nutrition strategies, programmes and plans has seen much progress in Nepal since the MSNP in 2012. In Kenya, coordination among stakeholders in the nutrition sector has improved since Kenya joined the Scaling Up Nutrition (SUN) Movement in 2012.

Moving towards financial sustainability: Nepal has established a budget line for MSNP and nutrition-specific interventions, which is a key step towards greater financial sustainability, although only 1.1% of its total budget was spent on nutrition in 2015 to 2016. The Government of Kenya also has a specific budget line for nutrition; however only 1.3% of its total health budget was spent on nutrition-specific interventions in 2014.

Resource mobilisation

Recent estimates suggest governments must collectively invest an additional US\$70 billion over ten years to achieve the World Health Assembly (WHA) targets on stunting, anaemia and exclusive breastfeeding by 2025 and treat SAM at scale. This includes US\$9.1 billion extra to treat SAM. Nutrition-sensitive allocations currently represent only about 1.7% of total government spending; it is recommended that domestic governments should commit at least 3% of relevant budgets

for nutrition. Financial sustainability lies in taking greater domestic ownership of CMAM, driving down ready-to-use therapeutic food (RUTF) costs and making sustained investments in prevention strategies.

An analysis of official development assistance (ODA) from the European Union (EU), UK and US for interventions relating to acute malnutrition between 2010 and 2014 showed that they gave just US\$270 million to 362 projects during this period. The EU supported the most projects relating to acute malnutrition (171), although most of these were funded via emergency or humanitarian funds. The US supported 161 interventions, while the UK supported 30 projects. Innovative finance could contribute an additional US\$3.4 billion over ten years; promising initiatives include UNITAID, UNITLIFE, The Power of Nutrition and The Global Financing Facility in Support of Every Woman Every Child, among others.

Governments of affected countries and donors currently spend tiny amounts on nutrition-specific interventions and overall the World Bank say a 3.5-fold increase is required to close the funding gap by 2025. The authors make several recommendations to governments and donors (Box 1) to help support the process of scale-up.

A three year old successfully treated for acute malnutrition in Kavrepalanchok district, Nepal



WFP/Claire Nevill

References

- UNICEF, WHO and World Bank Group (2016) *Levels and trends in child malnutrition*: UNICEF, WHO, World Bank Group joint estimates: Key findings of the 2016 edition. Available from: www.who.int/nutgrowthdb/jme_brochure2016.pdf
- UNICEF (2015) *Annual results report: Nutrition*. Available from: www.unicef.org/publicpartnerships/files/2015ARR_Nutrition.pdf
- WHP, WFP, UNSCN and UNICEF (2007). *Community-based management of severe acute malnutrition* Joint statement. Available from: www.who.int/nutrition/topics/statement_commbased_malnutrition/en/

Aid effectiveness of the Zimbabwe multi-donor trust fund

Summary of research¹

Location: *Zimbabwe*

What we know: There is a lack of evidence on the extent to which multi-donor trust funds (MDTFs) contribute to aid effectiveness in fragile and conflict-affected states.

What this article adds: A recent evaluation examined the extent to which a Zimbabwe MDTF (ZimFund) targeting water, sanitation and energy sectors adhered to the Paris Declaration principles on aid effectiveness between 2010 and 2013. Interviews examined the key principles of ownership, alignment, harmonisation, mutual accountability and management for results. Although aligned with national development priorities, the Government of Zimbabwe (GoZ) lacks ownership and direct engagement in the ZimFund, which is largely donor-driven. There has been little investment in state infrastructure and use of local procurement systems. A communication strategy has been poorly implemented. The ZimFund increased harmonisation among international donors but not between in-country stakeholders. A limited mid-term review and weak performance-tracking raise concerns regarding accountability. The review concludes that political relations between recipient and donor countries are vital for the functioning of MDTFs; MDTF design affects delivery and function; targeting local authorities could offer more tangible results; and focusing on the recovery of key sectors such as water, sanitation and energy could lead to MDTFs having direct, positive impacts on the recipient country.

Introduction

The central financing vehicle increasingly used in fragile and conflict-affected states (FCAS) is the multi-donor trust fund (MTDF), which channels pooled aid resources from government and non-government donors, administered by an agreed trustee organisation. Zimbabwe is a fragile state where the international donor community's collective response revolves around five MDTFs. One of these is the Zimbabwe MDTF (ZimFund). This was created at the request of seven main donors in Zimbabwe to rehabilitate water, sanitation and energy. Since 2010, the fund has been administered by the African Development Bank (AfDB). The fund is governed by a Programme Oversight Committee (POC) that oversees all functions and administration and reviews progress, and an MDTF management unit (MMU), responsible for the collection and quality control of project proposals and appraisal. The AfDB is both fund manager and implementing agency, although actual implementation is contracted to external companies. The fund has two projects, the first of which is the Urgent Water Supply and Sanitation Rehabilitation Project (UWSSRP), implemented in six municipalities to increase reliability, quality and availability of water supply, restore water treatment capacity and reduce incidence of cholera and other water-related diseases, with a grant of US\$29.65 million. The second is the Emergency Power Rehabilitation Project (EPRP, which aims to improve the reliability of power supply through the rehabilitation of Hwange Power Station Ash Plant and the sub-transmission and distribution facilities within the country, with a grant of US\$35 million. This paper evaluates ZimFund adherence to the Paris Declaration principles on aid effectiveness to provide vital insights for MDTF literature.

The author undertook interviews with 23 individuals, selected through purposeful sampling based on their association and experience with ZimFund projects, mainly from the Government of Zimbabwe (GoZ), ZimFund donors and the

AfDB. Interviews were conducted between 1 June and 1 September 2013 using a set of open-ended questions based on the five Paris Declaration principles on aid effectiveness: ownership, alignment, harmonisation, mutual accountability and management for results. The paper evaluates findings in each of these five areas.

The principle of ownership is that donors should strengthen government capacity in implementing and managing development projects. The ZimFund focuses on priorities in the GoZ's development strategy (the medium-term plan (MTP) 2011-2015); however the GoZ is not directly involved in the management of the fund, which is to a large extent 'donor-driven'. Fund donors are restricted in engaging directly with the GoZ, due to sanctions by their own governments, and have therefore been forced to use indirect means of engagement through the AfDB, a non-state actor. Opportunities for the GoZ to have proper engagement and ownership of the fund have therefore been missed.

While the focus of the ZimFund is aligned with MTP priorities, there is poor alignment between fund activities and local authorities and with the Zimbabwe Electricity Supply Authority (ZESA). As a result there has been little investment in state infrastructure. Government ministries are provided with short-term consultants or specialists contracted by the AfDB to assist in certain areas, rather than building capacity of government employees, and a separate procurement system is used, which leads to overseas rather than local product procurement. In this way, ZimFund donors exert excessive control.

Government officials do not always attend POC meetings (this could be improved on) and there is little evidence that such meetings are used as a way of harmonising ZimFund projects with other donor projects in Zimbabwe. Efforts have been made by the MMU to develop a broad communications strategy that communicates pro-

gramme information to a wide audience and guidance exists for ZimFund projects to include environmental and social components. However, interviews and results of a 2013 mid-term review reveal that this has not filtered through into practice. The ZimFund has, however, facilitated harmonisation of the seven donors' activities in Zimbabwe through coordination of activities and development of common planning, monitoring, evaluation and reporting.

In terms of mutual accountability, the ZimFund produced a mid-term review in 2013 to provide an account of its activities and internal workings, but only partially fulfilled the terms of reference. Areas not covered include detailed analysis of ZimFund compliance with bank rules and procedures, risk assessment and mitigation measures, donor coordination, and monitoring and evaluation. This demonstrates some lack of accountability. Furthermore, the ZimFund monitoring processes are detached from government processes and, at a ministerial level, the Ministry of Finance does not directly account for ZimFund projects to parliament. On the positive side, the Ministry of Finance did report to parliament on ZimFund progress through budget statements for 2012 and 2013 and reports from the POC are sent to the cabinet, which constitutes some accountability to the legislature.

In terms of management for results, ZimFund has so far used a weak performance assessment framework that does not provide detail on performance and indicators, although efforts are being made to improve this. The 2013 mid-term review found no tangible results on the ground in the form of implementation, which has been a concern for stakeholders, including the GoZ. However, there is recognition that this is a pilot programme for the AfDB and donors alike, both of whom lack MDTF experts and are constantly learning, which has created delays.

This case study demonstrates that aid effectiveness of MDTFs is context-specific and heavily influenced by politics and the institutional structure of the trust fund. The experience of the ZimFund provides several lessons. Firstly, political relations between recipient and donor countries are vital for the proper functioning of MDTFs; this has been severely hampered in the case of the ZimFund by donors working through non-state actors. Secondly, design of MDTFs has an important effect on delivery and, when there is no formal engagement with government, the use of neutral, acceptable and credible bodies as fund administrators is fundamental. Thirdly, while the legitimacy of national governments in fragile states is often contested, targeting legitimate and credible state institutions, such as local authorities, can offer tangible results. Finally, MDTFs focusing on the recovery of key sectors such as water, sanitation and energy have direct impacts on economic recovery and people's lives.

¹ Muchadenyika D. (2016). *Multi-donor trust funds and fragile states: assessing the aid effectiveness of the Zimbabwe multi-donor trust fund*. Journal of international development. 28, 1337-1357. DOI: 10.1002/jid.3237

² The Paris Declaration (2005) is a practical, action-oriented roadmap to improve the quality of aid and its impact on development. It outlines a series of specific implementation measures and a monitoring system to assess progress. www.oecd.org/dac/effectiveness/parisdeclarationandacraagendaforaction.htm

Review of WHO guidelines for the inpatient management of severe acute malnutrition

Summary of research¹

Location: *Global*

What we know: Optimising SAM management is an important strategy for reducing malnutrition-related mortality.

What this article adds: A recent review examined the evolution and evidence supporting existing guidelines on the inpatient management of SAM. Gaps persist and extend across the entire spectrum of guidance on the management of complicated SAM. Absence of relevant published data has forced a reliance on expert opinion (the basis of half the recommendations). Supporting evidence is often of very low quality and not specific to the recommended treatment. Recommendations based on expert opinion (clinical experience and basic science) or weak evidence are not necessarily incorrect but clinical context has changed; changes include an emerging younger infant caseload and outpatient treatment changing inpatient profile. There are significant gaps in evidence-based clinical guidance, which include HIV case management, management post-discharge mortality, antimicrobial therapy and fluid management. WHO guidance has failed to keep pace with developments and experience; more trials are needed to strengthen the evidence base.

Each year, severe acute malnutrition (SAM) is the direct cause of an estimated 540,000 child deaths and contributes to many other child deaths (Black et al, 2013). SAM without medical complications can be effectively managed in the community; however complicated cases still warrant inpatient management. Case fatality rates should be less than 10% if adhering to World Health Organization (WHO) inpatient management guidelines. However, despite reported compliance, mortality rates of 10 to 40% are documented among hospitalised SAM children in sub-Saharan Africa (Kerac et al, 2014; Fergusson and Tomkins, 2009). Optimising SAM management is an important strategy for reducing malnutrition-related mortality.

WHO's first guidelines on the management of malnutrition (1981) were replaced in 1999 by guidelines on the management of SAM. Both summarised decades of clinical experience and described the achievement of low malnutrition-related case fatality rates in specific settings. Further guideline revisions were made in 2003 and 2013. Relevant joint statements from WHO and other United Nations (UN) agencies were issued in 2007 and 2009. The combination of these documents constitutes the current WHO SAM guidelines. A recent review identified evidence gaps within the guidelines which, if filled, may help reduce mortality further.

The evolution of each recommendation's development was traced using Google scholar and the WHO website, including documents predating current guidance, and any modifications and references cited in support of the recommendation noted. Each recommendation was evaluated using the GRADE system. To determine the aims and extent of any recently completed, ongoing or pending trials relevant to the management of complicated SAM, the authors searched the WHO

International Clinical Trials Registry Platform, clinicaltrials.gov and the Controlled Trials metaRegister until 10 August 2015.

Eight documents containing 33 current recommendations met the inclusion criteria.

- Expert opinion, in the absence of published evidence, was the basis for 16 (48.5%) of the recommendations. Three (9.1%) and six (18.2%) of the recommendations were drawn from direct observational or indirect evidence (the study population was not complicated SAM children), respectively. The remaining recommendations (24.2%) were each supported by at least one direct randomised trial.
- Twenty-three (69.7%) recommendations had been added or revised since the original 1999 guideline. Six (26.1%) were supported by a directly relevant randomised trial. Three (13.0%) and six (26.1%) were supported by at least one direct observational or indirect study, respectively. The remaining eight (34.8%) recommendations had no supporting citations.
- The 1999 guidelines presented a ten-step management protocol. Five (15.2%) of the 33 current recommendations are identical to or are slight modifications of the recommendations first proposed in the 1996 article. Seven (21.2%) of the current recommendations originated before 1996; five were slightly revised.
- Trials registries included 20 studies related to the topic, 15 of which had been completed and four of which had been published. Two trials reported statistically significant results: one demonstrated that community follow-up increased linear growth and clinical attendance and the other that long-chain n-3 polyunsaturated fatty acid in erythrocytes increased among children with SAM who were given ready-to-use therapeutic foods (RUTF)

enriched with polyunsaturated fatty acid. Nine trials were of alternative feeding regimens. Acute medical management and follow-up care studies were minimally represented.

Results show that gaps persist and extend across the entire spectrum of guidance on the management of complicated SAM. The absence of relevant published data has forced a reliance on expert opinion. Supporting evidence was often of very low quality and was not specific to the recommended treatment. Guideline reforms have been driven by an overwhelming clinical need rather than by compelling evidence.

Recommendations supported by weak evidence or expert opinion are not necessarily incorrect; many are grounded in basic science research and careful clinical observations. However, the population of paediatric inpatients with SAM has dramatically changed in the last ten to 20 years: human immunodeficiency virus (HIV) has emerged as an important contributing problem; younger infants now represent an increasing proportion of malnourished children; and outpatient care for uncomplicated cases has eclipsed hospital management. Data from previous eras may therefore not be generalisable to the modern child with complicated SAM.

In some areas the absence of clinical data is particularly concerning, such as in the management SAM in HIV-infected children and infants. Post-discharge mortality in SAM cases is high but poorly understood. Empiric antibiotics have been recommended since at least 1969 and the currently endorsed regimen has remained unchanged since standardised in 1996. Antimicrobial therapy and fluid management are both conspicuous knowledge gaps.

In conclusion, WHO's guidelines on the inpatient management of SAM have a weak evidence base and have undergone limited substantive adjustments over the past decades. More trials are needed to make that evidence base more robust. If the mortality associated with SAM is to be reduced, inpatient and post-discharge management trials, supported by studies on the causes of mortality, are needed.

¹ Tickella KD and Dennob DM. (2016). *Inpatient management of children with severe acute malnutrition: A review of WHO guidelines*. Bull World Health Organ 2016;94:642–651. doi:10.2471/BLT.15.162867

² The Grading of Recommendations Assessment, Development and Evaluation. www.gradeworkinggroup.org/

References

- Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M et al. *Maternal and Child Nutrition Study Group. Maternal and child undernutrition and overweight in low-income and middle-income countries*. Lancet. 2013 Aug 3;382(9890):427–51. doi: [http://dx.doi.org/10.1016/S0140-6736\(13\)60937-X](http://dx.doi.org/10.1016/S0140-6736(13)60937-X) PMID: 23746772
- Kerac M, Bunn J, Chagaluka G, Bahwere P, Tomkins A, Collins S, et al. *Follow-up of post-discharge growth and mortality after treatment for severe acute malnutrition (FuSAM study): A prospective cohort study*. PLoS ONE. 2014;9(6):e96030.
- Fergusson P and Tomkins A. *HIV prevalence and mortality among children undergoing treatment for severe acute malnutrition in sub-Saharan Africa: a systematic review and meta-analysis*. Trans R Soc Trop Med Hyg. 2009 Jun;103(6):541–8.

A multisector approach to monitoring planned and actual nutrition spending

By Amanda Pomeroy-Stevens, Alexis D'Agostino, Madhukar B Shrestha and Abel Muzoora



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Location: *Nepal and Uganda*

What we know: Transparent, routine and timely nutrition-financing data are needed to track country investment in nutrition.

What this article adds: SPRING has developed a methodology to analyse planned and actual spending for nutrition from a government perspective, including system diagnostics to inform future monitoring. It involves nine steps over three phases (collection, validation and analysis). The method was tested and refined in pilots in Uganda and Nepal. Challenges that required adjustments included: highly aggregated budget lines, lack of budget expertise among nutrition technical staff, lack of national-level data on central transfers to districts, off-budget data accessible only in NGO reporting databases, and variation between costing and budget exercises. Recommendations include exploring options to track nutrition activities such as cross-sector tracking codes or sector-specific budget lines and building budget analysis and advocacy into government training for nutrition staff. A global consultation involving the SUN Movement and others was convened to broaden learning. Next steps are to reassess emerging evidence and share recommendations more widely.

Introduction

Poor nutrition poses a great risk to the health and wealth of any country. Increased funding for nutrition is critical to address this. According to the 2014 Global Nutrition Report, every US dollar (USD) spent on reducing stunting provides a return of USD16 through increased development and improved health. However, recent estimates show that current financing available for nutrition is only about one third of what is needed to meet global targets (Shekar et al, 2016). Countries and partners must monitor nutrition financing to address funding shortfalls and develop country-specific investment goals. These data are surprisingly difficult to collect – they are not in just one sector and are often buried within existing budget structures (Lamstein et al, 2016). The 2016 Global Nutrition Report emphasised the need for more widely available and comprehensive data on nutrition spending, especially for indirect (or nutrition-sensitive) nutrition activities that can vary greatly from country to country.

Several steps are needed to effectively measure and monitor financial support for nutrition at the country level (see Figure 1). While many governments have completed costing exercises for their National Nutrition Action Plans (NNAPs) (Step 1), fewer have completed the remaining steps outlined in this graphic. Steps 2 and 3 are related: budget allocations, or the amount officially approved to be spent, can be considered “planned spending,” while expenditures measure actual spending. Step 4 tracks the amount of financing that reaches the service delivery level. Countries that have started analysis have had to rely on primary data collection methods because of the lack of nutrition-related information in routine government systems. The Scaling Up Nutrition (SUN) Movement's support for countries' documentation of nutrition financing has improved documentation in this area; however to date only Guatemala and Peru have developed routine monitoring mechanisms for nutrition spending within their government systems (Victoria et al, 2016).

Figure 1 Steps to track financial support for nutrition



Phases of the budget cycle



USAID's SPRING project has developed an approach that countries can use to bridge the gap between primary data collection and developing more routine systems. Here, challenges faced in two countries are discussed, as well as adjustments made to overcome these challenges and how this information can strengthen efforts to create routine monitoring systems.

Methods

SPRING developed a methodology to analyse planned and actual spending for nutrition, with the goal of also providing system diagnostics to help move countries closer to routine monitoring of nutrition funding. The methodology is captured in SPRING's budget analysis tool and guide for users¹.

The government's perspective was used to decide what to include as nutrition, using each country's pre-defined NNAP activity lists (in Nepal's *Multi-Sector Nutrition Plan* and the *Uganda Nutrition Action Plan*). This has the benefit of providing a clear mandate and justifi-

cation for what nutrition actions to include in the analysis, but the drawback of reducing comparability of total estimates across countries. Official government data sources were prioritised where possible, both for on-budget and off-budget data. The final methodology includes nine steps over three phases: collection, validation and analysis, described in Figure 2. The benefits of this methodology are both its flexibility and utility as a diagnostic tool. It produces national estimates that can be divided by funding sources (government or external development partner (EDP)); financing mechanism (government budget ("on-budget") or outside the budget ("off-budget")); sector; or NNAP priority area. As a diagnostic tool, users will systematically uncover gaps in the documentation of budget data, identify which stakeholders are needed to support more routine nutrition financial tracking, and define the preferred format of data reporting.

Piloting of the methodology

SPRING tested and refined this methodology via the *Pathways to Better Nutrition* case studies in Uganda (2013–2015) and Nepal (2014–2016) (CABRI, 2008; Jelovac & Vandenindon (2008); MoFPED, 2013). These studies documented the enabling environment, including financing, for nutrition action in each country and provided an excellent opportunity to test this approach. The approach was also tested in two districts in Uganda, Kisoro and Lira. Collecting multiple years of data from both countries allowed us to refine the approach for the final tool.

Results

Several challenges were identified that required adjustments. Both Nepal and Uganda will need to systematically address these challenges to create more routine nutrition financial tracking.

Challenge #1:

Highly aggregated budget line items

Often in nutrition we want to know how much has been spent on one particular nutrition activity, but budgets may not go into that level of detail. In Nepal and Uganda, the authors found highly aggregated budget "line items" – the lowest level of appropriations in a budget, that include many and varied activities – which made it difficult to identify specific nutrition activities. Frequently, little or no detail was provided in the budget on the type of activities included.

To complicate things further, in both cases more than 90% of nutrition-related activities were integrated into larger, non-nutrition line items. One example of an integrated line item from Nepal was the Integrated District Health Programme (IDHP) under the Ministry of Health (MoH), which included all types of nutrition activities, but also other non-nutrition health activities. Because of this, it was often impossible to get accurate estimates of funding down to the level of single nutrition activities.

Adjustment #1:

Triangulating data sources during validation allowed for disaggregation of most integrated budget line items

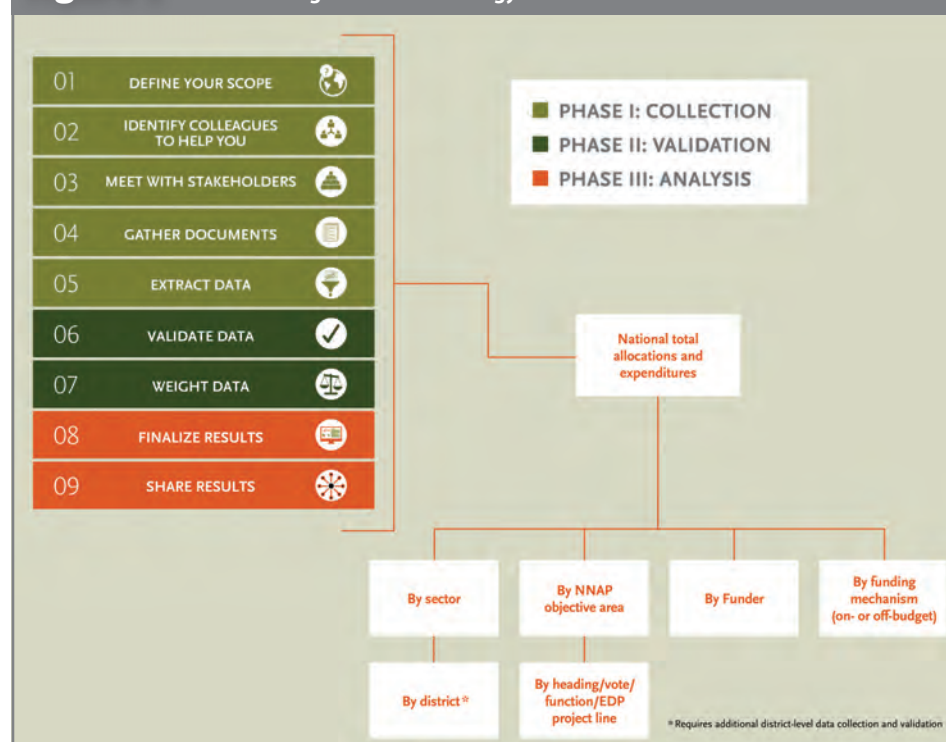
To address this, the authors conducted validation meetings with a detailed interview guide to break apart budget line items. In the example of the IDHP item, interviewing the relevant budget officer at the Nepal MoH allowed the authors to obtain a sub-line item that showed that around 3% of the IDHP was nutrition-relevant. This percentage included various nutrition-specific (e.g., Integrated Management of Acute Malnutrition, Breastfeeding Week and vitamin A supplementation) and nutrition-sensitive (e.g., child cash grants, nutrition strategic planning and adolescent nutrition) activities. In another cases, for instance Uganda's Food and Nutrition Security Surveillance programme, it was only possible to confirm that 100% was allocated to nutrition-relevant activities, with no further data on single-activity estimates. In the long-term, improving budgeting expertise among nutrition technical staff could make a more routine system of data reporting and validation possible.

Challenge #2:

Lack of budget expertise among nutrition technical staff

The authors planned to fill all data gaps in the budget documents with input from the sector planning offices which house budgeting and financing staff and mobilise resources for each sector. However, it was difficult to identify appropriate budget officials when validating the data. In Nepal, most technical staff said they had fairly regular communication with their planning offices and could usually direct the research team to the appropriate planning officer for each item. In Nepal, planners provided either documentation or verbal breakdowns of the nutrition-related funding for 80% of the 40 line items identified. Planning offices in ministries

Figure 2 SPRING's budget tool methodology



¹ www.spring-nutrition.org/budget-tool



Deulekh village,
Bajhang District,
Nepal

WFP/Bikil Shapit

newer to the national nutrition effort were less likely to be able to provide this information.

In Uganda, technical staff did not report strong existing connections to planners for their sector or district, resulting in fewer referrals for validation interviews. Only one validation interview was conducted for each of the seven ministries, covering 26 integrated line items in Uganda. This affected the accuracy of nutrition allocation and expenditure estimates; documentation or verbal breakdowns of nutrition-related funding were provided for only about 25% of items. Technical staff in a few sectors in Uganda also noted they had limited knowledge of the budget documents.

Adjustment #2:
Training on budgeting for nutrition provided ministry staff with data-monitoring skills and an incentive to use nutrition-financing data

To address this challenge, and in response to requests from government officials in Uganda, SPRING worked with MoH officials and partners to train ministry staff on the Ugandan budget cycle, budget documents, advocacy points for nutrition funding and other topics. District officials in both Nepal and Uganda also requested this type of training to complement the ongoing NNAP-related nutrition trainings. These trainings have the potential not only to improve the reporting of nutrition-related financing, but also provide nutrition technical staff with more avenues to advocate for nutrition and could be adapted to include training on reporting in routine systems. SPRING's tool can be used as the basis for these trainings.

Challenge #3:
Lack of national-level data on central transfers to districts

Much of the money for district-level activities comes from 'central transfers', which are transfers of money from the national (central) government to sub-national bodies. These are usually ignored in estimates of national nutrition-related funding due to the way that they are documented within national budget documents, even though they form a substantial proportion of total funding.

Provided by the national government, central transfers may be conditional (earmarked for particular activities) or unconditional (districts can spend them for any activity) and were accounted for differently in budget documents in Nepal and Uganda.

In Nepal, most conditional transfers were included in central government budget-line items for each sector, which meant that they could be validated just like any other national programme. This was also, generally, how EDPs funded off-budget, sub-national activities in both countries. Unconditional transfers, on the other hand, are not attached to any central-level activities and so could not be centrally validated. In Uganda, both types of central transfers were listed in highly aggregated budget-line items in separate volumes or sections of each sector's Ministerial Policy Statements (MPS) and in the Ministry of Local Government (MoLG) MPS. For some years, no expenditure data for these line items were available. The only way to obtain accurate information on the nutrition-sensitivity of unconditional central transfers in both countries would be to collect data from each district.

Adjustment #3:
Cross-referencing sub-national budget documents helped create estimates of the contribution of central transfers to total nutrition financing

Budget data were examined in two representative districts in Uganda. From this, the authors could better understand central transfers and how they related to nutrition. Findings show that Kisoro received USD 0.5 million and Lira received USD 0.3 million in nutrition-related conditional central transfers and unconditional central grants for 2014–15 (Lukwago et al, 2016; Lukwago et al, 2016a). A simple, 'back of the envelope' extrapolation to expand these estimates to all districts would suggest that over 80% of all on-budget nutrition allocations in Uganda are some form of central transfer.

This exploratory exercise highlights how important it is to accurately track district-level nutrition funding. The estimated contribution of central transfers was substantial in both countries. If routine reporting of district spending were designed to feed directly into the national budget format, it would allow for national-level ministries to better estimate their total contribution to nutrition.

Challenge #4:
Off-budget EDP data only available in non-governmental reporting databases

Funding that is not reported through the government budget (nor managed through the government treasury) can make up a large amount of total nutrition funding; for instance, many bilateral funders run their funds off-budget. Off-budget funding is done to speed implementation and ensure appropriate usage of funds and is carried out when absorption capacity of national financial systems is low, but because

they are not reported through the official budget, it can be very difficult to find any records of these funds. Sifting through these data on a donor-by-donor basis is not possible – in both countries hundreds of potentially nutrition-related projects receive funding each year and in addition each donor may report on a different financial calendar than the government. Leaving out data on off-budget financing for nutrition would significantly underestimate the nutrition-related funding. While some funders are moving toward more on-budget reporting, this is still a major threat to the accuracy of both primary and routine data for nutrition budget analysis. Beyond nutrition, this issue has been recognised as a universal threat to aid transparency: the Busan Conference on Aid Effectiveness in 2011 (endorsed by 161 countries) set a maximum of 15% for off-budget aid as part of the ten national voluntary targets to be met by 2015. For comparison, SPRING found that about 51% of all EDP nutrition allocations were off-budget in Nepal, while 97% were off-budget in Uganda during the last year of analysis.

Adjustment #4:
Use aid management platforms to track off-budget data

In both Nepal and Uganda, national policy dictates that EDPs should voluntarily self-report off-budget financing through the Ministries of Finance (MoF). Both MoFs have recently endorsed the use of an online, open-access aid management platform (AMP) to facilitate this reporting (Nepal in 2013, Uganda in 2014). Reporting aligns with the government fiscal year and donors report into the system quarterly. AMP templates vary by country, but most include commitments, disbursements and short project descriptions for each off-budget activity.

This approach worked well in Nepal, although the system was still being populated and refined during the time of this study. Since Uganda's AMP was not available in 2013, the previous reporting structure had to be used, which was a paper-based report that did not include any disbursement data. In interviews, the MoF declared it did not have a set schedule for publishing these data, and the most recently released report was published in 2013. This provides a useful reference point for the improvements the AMP has made in transparency of these off-budget data. At the district level, off-budget data are even harder to find; for the analysis in Kisoro

Budget analysis



Digging into budgets



and Lira, the authors had to go to each individual donor or civil society organisation (CSO) working there to obtain these figures, which were often aligned to a different fiscal year and not always disaggregated to the district level.

While some issues of missing data still remain, SPRING found the AMP to be a major step forward in project-level financial reporting in these two countries. Until more aid funding can be reported through the official budget, efforts to create routine reporting for nutrition financing should consider linkages to AMPs.

Challenge #5: Variation between costing and budget methodologies

Comparing projected NNAP costs to spending can identify gaps in nutrition investment. The authors heard from key informants in both countries that spending (both planned and actual) was not always sufficient to cover NNAP activities each year. However, when the inflation-adjusted costs were compared to total allocation estimates for nutrition, both countries appeared to have allocated close to ten times more funding than the projected costs. This surprising result led us to look further at the comparability of costing and budget analysis methodologies.

NNAP costing exercises often use “bottom-up” methodologies that can underestimate overhead costs and efficiencies of scale. It was not possible to find full records on the costing methodology used in Uganda, but the Nepal documentation suggests that the costing excluded the existing personnel and facilities in some parts of their plan, but included them in others (Connolly, 2014; SUN, 2012; Pokharel et al, 2011). Conversely, all current budget estimations, including SPRING’s, rely on “top-down” methodologies that can overestimate input costs. The inclusion of EDP projects may have increased estimates further because of higher management and transaction costs for these projects. These differences may explain why it appears that current funding is more than sufficient to meet costs, despite key informant reports that funding is not sufficient.

Adjustment #5: Documentation of differences in methodologies

When presenting final results for Nepal and Uganda, the authors were careful to note potential

differences in the methodologies. Because of this challenge, comparison of costs to allocations or expenditure were not included in the SPRING tool, even though there is high demand for this type of analysis. It would be resource-prohibitive to undertake a bottom-up NNAP expenditure analysis in most countries. Countries and partners need to keep these cost-spending comparisons in mind when they design the costing of any NNAP. Additional work is needed to better understand how to align budget tracking methodologies without causing an undue data collection burden and how to include these comparisons in any routine monitoring system.

Discussion

Transparent, routine and timely nutrition-financing data are needed at the country level. While countries must take the lead on monitoring nutrition financing, global actors can support development of budget-monitoring methodologies and increase local capacity.

SPRING’s approach provides funding estimates while also providing critical diagnostic information on current financial data on nutrition activities. The five primary challenges to data accuracy that were uncovered during piloting provide lessons on how to strengthen reporting. The authors offer the following recommendations to countries for future action to facilitate routine budget data collection:

1. Explore the best options for tracking nutrition activities within the government budget. Some existing options include attaching cross-sector tracking codes to activities to make them easier to find within budgets (like those used for gender or climate change in Nepal) or creating a specific nutrition budget line in each sector for nutrition activities.
2. Build budget analysis and advocacy into regular government NNAP training activities for all nutrition staff. This recommendation is equally relevant to EDP staff.
3. Include reporting of district nutrition financing in regular district reporting systems, such as the output-based budgeting tool in Uganda.
4. All EDPs should commit to following the 2011 goals and targets set for aid effectiveness, including timely reporting of financing (which can be done via the AMP) and eventually moving more EDP financing on-budget for greater transparency (Global Partnership for Effective Development Cooperation, 2013).
5. Use budget estimates as a starting point for the next NNAP costing, then refine with bottom-up approaches. As regular tracking of unit expenditures improves, future budget estimates can also use a comparable mix of top-down and bottom-up approaches.

Change will not happen overnight but, if successful, these longer-term adjustments can reduce time and the cost of collection while increasing transparency, accountability and accuracy of nutrition-financing data.

The testing of this methodology was only done in two countries. There is a wide range of experiences in nutrition-budget monitoring, both globally and within countries, as outlined by the SUN Movement (2015) and the latest *Global Nutrition Report*. To broaden the learning base in this area, SPRING co-convened a global consultation with SUN, Results for Development, the Maximizing the Quality of Scaling Up Nutrition project, and others. This platform has been used to share country experiences in nutrition-budget monitoring and analysis, identify cross-cutting barriers and develop recommendations to overcome these barriers.

Next steps include reassessing guidance as new evidence emerges and sharing the recommendations more widely. The authors hope that the results of such efforts can help create an investment case for nutrition and improve the efficiency of spending on nutrition activities.

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References

- CABRI. *Putting Aid on Budget*. Synthesis Report. Centurion; South Africa: Collaborative Africa Budget Reform Initiative; 2008.
- Connolly H. *Learning from Efforts to Cost Country Plans: Priority Technical Issues to Address*. Washington, D.C.: IFPRI; 2014.
- Global Partnership for Effective Development Cooperation. *Guide to the Monitoring Framework of the Global Partnership* [Internet]. New York, NY: UNDP, OECD; 2013. Available: <http://effectivecooperation.org/wp-content/uploads/2016/08/Guide-to-the-GP-Monitoring-Framework.pdf>
- Jelovac I, Vandeninden F. *How Should Donors Give Foreign Aid? Project Aid Versus Budget Support*. Rochester, NY: Social Science Research Network; 2008 Apr. Report No.: ID 1139811.
- Lamstein S, Pomeroy-Stevens A, Webb P, Kennedy E. *Optimizing the Multi-Sectoral Nutrition Policy Cycle – A Systems Perspective*. Food Nutr Bull. 2016;37: S107–S114.
- Lukwago D, Tibesigwa D, Brucker M, Herbert M, Muzoora A, Adero N, et al. (2016) District Technical Brief: *Report on Nutrition Financing in Kisoro District – 2013/2014 and 2014/15 Financial Years*. Arlington, VA: Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) Project; 2016 Jan.
- MoFPED. *Report on Loans, Grants and Guarantees for Financial Year 2012/13*. Kampala, Uganda: Government of Uganda; 2013.
- Pokharel RK, Houston R, Harvey P, Bishwakarma R, Adhikari J, Pant KD, et al. *Nepal Nutrition Assessment and Gap Analysis 2011*. Kathmandu, Nepal: National Planning Commission (NPC), Ministry of Health and Population (MoHP); 2011 Mar.
- Scaling Up Nutrition (SUN). *Costing and Resource Mobilization for the Multi-Sectoral Plan: The Nepal Experience*. SUN Focal Points Meeting; 2012 Sep 26; New York, NY.
- Shekar M, Kakietek J, D’Alimonte M, Walters D, Rogers H, Dayton Eberwein J et al. *Investing in Nutrition: The Foundation for Development: An Investment Framework to Reach the Global Nutrition Targets*. Washington, D.C.: World Bank, Results for Development, Bill and Melinda Gates Foundation, CIFF, Thousand Days; 2016.
- Victoria P, Luna A, Velasquez J, Rios R, Gonzalez G, Knechtel W et al. Panel 7.1: *Guatemala and Peru: Timely Access to Financial Data Makes a Difference in Actual Spending and Spurs Accountability at All Levels*. Global Nutrition Report 2016: From Promise to Impact: Ending Malnutrition by 2030. Washington, DC: International Food Policy Research Institute; 2016. p. 83.

Learning from the Porridge Mums project in northeast Nigeria

By Ellyn Yakowenko and Silke Pietzsch



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case study on the 'Porridge Mums' approach in Nigeria on which aspects of this article are based.



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Action Against Hunger USA would like to acknowledge Maureen Gallagher, former Senior Nutrition and Health Adviser, who was instrumental in conceptualising the Porridge Mums approach. The authors also acknowledge support and contributions of the Action Against Hunger Nigeria teams at both mission (Abuja) and field (Maiduguri) levels and the support and services of community leaders and traders who make these activities possible. Finally, thanks to the beneficiaries of the programme who were willing and generous in sharing their time, stories and experiences.

Location: Northeast Nigeria

What we know: Care group models are sometimes used in emergency settings to enable access to food, infant and young child feeding (IYCF) education and to facilitate mother-to-mother support.

What this article adds: In 2014 Action Against Hunger Nigeria initiated a programme to improve the nutrition of internally displaced persons (IDPs) in northeast Nigeria which included IYCF support groups. Pregnant and lactating women (PLW) and their children under five years of age were provided with one supplementary meal per day via community kitchens, monthly IYCF education sessions, safe spaces for PLW to gather, and mid-upper arm circumference (MUAC) screenings. Porridge Mums (PMs) functioned well in groups of 12-15 women; adaptations included rotation of recipes, redesigned stoves and shared kitchens between groups, which helped increase coverage. Success factors included: acceptance of some food sharing among non-beneficiaries; understanding the social dynamics of members from different villages or communities; involvement of community leaders; adequate training for staff, including facilitation and community mobilisation skills; cross-linkages with other programmes for consistency and complementarity; and willingness of all involved to adapt to changing needs.

Introduction

Since 2009, populations living in northeast Nigeria have been deeply affected by the continued violence and insecurity caused by the Boko Haram insurgency. Borno State continues to host the most internally displaced persons (IDPs) (nearly 1.5 million)¹, with repeated attacks continuing to undermine livelihoods and overwhelm a humanitarian response. Most (80%) of these IDPs live in informal settlements and have experienced protracted displacement (one year or more). Since 2014 Action Against Hunger Nigeria has implemented the 'Protecting and Promoting the Food and Nutrition Security of IDPs in Borno State, northeast Nigeria' project, funded by the United States Agency for International Development Office of Food for Peace (USAID/FFP). This programme is comprised of two components: a cash-based, food-assistance programme that ensures access to a nutritious family food basket; and Porridge Mums (PM) – infant and young child feeding (IYCF) support groups that provide a platform for women to come together, learn and discuss improved care and feeding practices. The PM approach was based on identified needs from a March 2015 assessment conducted in Maiduguri and Jere local government areas in Borno State, which indicated low dietary diversity for children under five years old. This article details Action Against Hunger's learning through implementation of the PM approach.

Methodology

Data collection was undertaken in a ten-day visit to Maiduguri in August 2016. Qualitative data collection methods involved four focus-group discussions with select PM groups; ten key informant interviews with PM leaders and vendors; 14 interviews and a facilitated GOAL exercise² with Action Against Hunger staff; six site visits to additional PM kitchens; and a review of relevant project-related documentation.

The field visit was also aligned with two project-closure meetings with stakeholders in Maiduguri, which served to further triangulate and elaborate the data collected for the case study.

The Porridge Mums (PM) approach

The PM design was based on a modified care group model for mother-to-mother (M2M) support in emergency settings, using cash transfer and adapted fuel-efficient stove components to facilitate the group cooking of nutritious, complementary meals. The main difference is that the care group model focuses on education, while the PM approach combines the group definition and educational component with wet feeding. The approach centres on the provision of one supplementary, nutritious meal per day to pregnant and lactating women (PLW) and their children under five years of age, as well as the promotion of optimal IYCF practices through education sessions; the facilitation of M2M support on healthy caring practices; the provision of safe spaces for mothers to gather, rest and discuss; and the monitoring of nutritional status through monthly mid-upper arm circumference (MUAC) screenings.

Targeting and coverage

The original plan was for 40 PM groups, each with 25 women, and the construction of one kitchen per group. In practice, however, this group size was too large to function effectively. Furthermore, the PLW/mother/caregiver criteria (Box 1) were not met in the initial pilot groups; hence groups were restructured to 12-15 women

¹ IOM DTM Nigeria Report Round 11, August 2016#.

² The GOAL exercise helped to define good practices related to the approach by facilitating a discussion around those aspects that the team wants to keep, eliminate, acquire/add/achieve or avoid in the future. Together these aspects create a goal for how to adapt the approach for the next implementation period.

Box 1 Location and targeting criteria for PM groups

Locations for the PM groups were determined based on the following criteria:

- Informal settlements and most vulnerable communities;
- Overlapping with Action Against Hunger food assistance and communities/settlements receiving WASH support;
- Confirmed by State Nutrition Officer as nutritional hotspot;
- Can identify a safe cooking space for the group.

Key entry criteria for group members were: female, PLW and mothers or caretakers of children under five years old, interested in nutrition and health issues, positive attitude and motivation to serve neighbours, and respected and trusted in the community. Literacy was not necessary (other than for the roles of secretary and treasurer).

and the full eligibility criteria implemented. This led to the formation of 68 PM groups. New kitchens could not be built for the additional 28 groups, so arrangements were made for them to share kitchens with existing groups, with a maximum of two groups per kitchen. Mobilisers approached community leaders to identify whom they would like to be part of a group, or selected women themselves. This approach led to high group motivation and cohesion; however it did not necessarily ensure that the most vulnerable women, most likely to benefit from the programme, participated. Certainly, there were some women who met the eligibility criteria who were unable to participate as groups were already full and one non-PM beneficiary mother presented to Action Against Hunger staff with a severely ill child, requiring immediate treatment. Future projects may need to reconsider increasing their resource allocation to ensure that all women meeting eligibility criteria within a given community can participate, possibly through the formation of two or more groups per neighbourhood.

Group functioning

Each PM group had two identified literate group

leaders, a secretary and a treasurer, who were responsible for managing the group's resources, including documenting foods purchased and number of beneficiaries receiving a meal each day. In a small number of groups where a literate leader could not be identified, an adolescent, typically without children, took responsibility for the leadership position.

Overall, PM groups seemed to function well in practice. On a rotational basis, group members prepared the daily nutritious meal for all. Women are reported to have actively participated in the monthly lessons. Dynamics evolved from eating separately (mothers taking their food home to eat) to eating together in the kitchen. Across all PMs visited as part of the study, participants were grateful for the assistance provided and emphasised how much they would like to continue the daily meals and monthly lessons.

Vouchers and cash transfers

Each PM group received an electronic voucher transfer using closed-loop smart cards, restricted to commodities associated with the group's daily meal to redeem at local vendor shops³. While many vendors were located in more distant larger markets, more local vendors were also part of the project. Mothers reported that the trips to the larger markets were beneficial as they consolidated additional shopping.

For the first few months of the project, all groups cooked 'Tom Brown' porridge (a local traditional porridge). Use of just one recipe allowed Action Against Hunger to streamline monthly voucher disbursements, calculated based on specific commodities needed. However, participants quickly got tired of this, so local project staff added additional recipes to the group's recipe repertoire with a two-week cycle. Voucher disbursements were realigned accordingly. The cost was based on 120 Nigerian Naira (0.38USD) per meal.

Action Against Hunger provided cooking equipment (three cooking pots and cooking spoons) and covered additional meeting costs, transport costs (for two group members), fire-

wood, grinding services and water. There were no major challenges with the e-voucher distribution; minor issues (delays in smart cards, card loss, broken card chips and delays with vendors acquiring atypical commodities) were resolved successfully. Vendors interviewed reported positive experiences and beneficiaries reported no problems.

Kitchen structures and construction

Action Against Hunger adapted the 'Lorena stove' model from east Africa to local design options, materials and services. A kitchen design with a larger physical footprint was chosen to provide shade and sufficient space for gathering, as well as a stove that would allow for group cooking (using large pots) and efficient cooking (using less fuel and generating less smoke). Permission was sought from the land owners and, in most cases, approval was readily given for construction; this was a critical step where displaced populations and communities were settled in compounds that were already owned or claimed in some form, even if not legally. Subsequent problems with flooding in the kitchen area during onset of the rainy season, which reduced use of and access to space for cooking, were easily resolved using tarpaulin sheets. Problems with smoke ventilation were also corrected in existing and new kitchen designs.

Porridge Mum recipes and nutrition educational lessons

Recipes for the PM project were derived from the Working to Improve Nutrition in Northern Nigeria (WINNN) programme Food Demonstration Manual that was developed around local foods common to Jigawa, Katsina, Kebbi, Yobe and Zamfara States of northern Nigeria and recipe cards were distributed to each group. A lesson plan for PM groups was developed in the initial stages of the project by Action Against Hunger nutrition staff based on the national IYCF guidelines and the WINNN-specific, IYCF community-based, education session materials.

Each month the Action Against Hunger Nutrition Officer develops a full, detailed lesson plan and trains each PM Nutrition Assistant to deliver the sessions to their groups. Topics include: maternal nutrition and the importance of a balanced diet (including micronutrient supplementation), breastfeeding and complementary feeding across age groups, good hygiene practices, and growth monitoring and promotion. Each session opens by exploring existing knowledge from the group about the theme of the month. The Nutrition Assistant then delivers the lesson, actively encouraging questions and exchange of experiences and concerns, seeks additional information, explains any risks of current practices and provides a counselling card for follow-up discussions.

A porridge mums kitchen, Nigeria



³ The cash-based food assistance program had a number of components, of which the PMs were a small proportion of the total population served. In the programme, a large range of vendors was contracted to participate in the electronic smart-card food-assistance transfers. The PM vendors were a subset of total vendors participating in the cash-based programme

Areas of new knowledge cited across groups as helpful included various breastfeeding positions; how to determine the consistency of the porridge (i.e. not making it too watery); how to tell if the baby is unhealthy (e.g. rashes) and if/when they should seek treatment; practices to improve personal hygiene (including critical times to wash hands); and which types of food fall into each food group, including what this means for nutrition overall. Anecdotal feedback showed that the women enjoyed learning new recipes and using them in home cooking and discussed lesson topics with non-beneficiary community members after the sessions.

Main influencing factors

The Action Against Hunger case study identified several factors which appear to have a strong influence on the PM groups, including:

Indirect beneficiaries

There is evidence that some food sharing is occurring in the groups, usually with elderly women or other mothers' children who visit during mealtimes; the extent of this is unknown. Sharing appears to occur most in neighbourhoods whose populations have highly mixed places of origin or where there are high numbers of women who meet the target criteria who are not enrolled in a PM group. The children of these women who receive food can be counted as indirect beneficiaries. Given the nature of sharing and the near inevitability of some sharing, cultural practices and expectations, implementing agencies must take this into account when designing and monitoring programmes of this type.

Place of origin

One key area of learning was the diversity of community composition across the intervention area and how this affected group dynamics. In some groups, households were from the same place of origin with some type of familial relationship; in others, people were of diverse origin with few familial ties. Where women came from diverse backgrounds, social ties appeared to be strengthened by the peer support of a PM group, especially when women had lost their husbands. In heterogeneous communities, staff observed higher levels of conflict within the group. This

will be an important area for future projects to explore in displacement contexts, relating not only to targeting but also to overall implementation, management and sustainability of the PM groups in practice.

Community leadership

Community leaders expressed a clear interest in being more involved in the project from the outset, when groups are formed, construction sites are chosen and care-practice messages are promoted. In many of these displaced communities, traditional leaders are struggling to maintain their positions within traditional cultural norms and practices. By involving community leaders in the process and allowing for a certain level of adaptive management, community leaders can provide a useful platform for the implementation and sustainability of PM groups over time.

Technical training and expertise

Local humanitarian capacities were minimal and nutrition emergency capacities non-existent in Borno at the time of this intervention. Nutrition Assistants were trained in taking MUAC measurements and received an orientation in the operations of PM groups, including IYCF sessions. However, those staff members hired after the start of implementation were not given this training due to a lack of time and increasing needs in the local emergency context. Such frontline staff are key to high-quality programme implementation; we must do better to ensure that all necessary skills are transferred to programme staff, including technical areas, facilitation and community mobilisation. Staff should also be made aware of their pivotal role in the success of the project and outcomes sustainability.

Cross-linkages

The PMs benefited from complementary activities under other projects implemented by Action Against Hunger's multi-sector response in the region. For example, under the initiative of the Maiduguri field teams, resources from the USAID Office of Foreign Disaster Assistance (USAID/OFDA) supported the construction of several latrines and bathing areas, co-located in those areas where PM kitchens were constructed. Action Against Hunger also capitalised on the earlier WINNN project, using these resources

as a technical springboard for the lessons. The WINNN IYCF cards used in the educational sessions are also in line with messages of the Government of Nigeria, ensuring consistency across stakeholders and durability of messages. These examples demonstrate that a small investment of time and interest to assess pre-emergency and development interventions prior to project implementation can help avoid reinventing the wheel and synergise resources.

Adaptation

Project staff have been alert to the needs of the beneficiaries and have been flexible and nimble in their responsiveness to field realities. This was possible due to the close relationship and understanding between the project team and the PM groups and a flexible donor. If we, as the humanitarian community, are serious about finding effective solutions in these situations, we must push for adaptation and creativity to better support populations in need.

Phase 2 developments

The project has now entered a second phase, with some modification of the original PM activities based on lessons learned, as follows:

- In phase 2, targeting criteria (PLW with children under five years old) have been clarified from the start, with group size limited to around 15 women. Group composition has been organised by maternal characteristics and age of children as follows: pregnant mothers, lactating mothers with infants under six months old, lactating mothers with children from six to 24 months, and mothers with children from two to five years. The number of groups has been scaled up to 80, with the goal of reaching 1,200 PLW and their children.
- The provision of supplementary food vouchers has been limited to four months, after which households are intended to provide their own food to be cooked at the communal kitchen on a biweekly basis. These households will already be receiving food assistance through vouchers, so will have the resources needed for food diversification.
- Groups will choose and validate one lead mother who will be trained on promoting IYCF behaviours and cascade this training among the group. Participants of the PM activity are intended to act as change agents in their community by cascading the nutrition education they have received to people living around them. This is expected to increase dietary diversity practices in their communities.
- The process of data collection will be improved to ensure consistency and aid proper analysis.

A costing exercise is planned to compare PMs with the care group model and wet feeding separately. This should be completed by end of 2017.

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A mother participating in the Porridge Mums programme in northeastern Nigeria



Filming for the Community Video programme in Niger, 2015

Community video in the Sahel: From pilot to scale

By Alix Harou, Marjolein Moreaux and Leanne Dougherty



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The authors would like to thank the SPRING teams based in Washington DC, Burkina Faso and Niger for their continuous efforts in implementing the community video approach in the Sahel. The authors would like to acknowledge Gwyneth Cotes, Esther Braud and Jennifer Pietropaoli for their support in reviewing this article.

Location: Niger and Burkina Faso

What we know: Social behaviour change communication (SBCC) approaches can be successful in improving uptake of behaviours for improved health and nutrition.

What this article adds: SPRING adapted and assessed the effectiveness and scalability of a community video (CV) approach to promote maternal, infant and young child nutrition (MIYCN) and hygiene in Niger and Burkina Faso. Videos produced by small groups of community members (“hubs”) promoted key behaviours, disseminated in community meetings alongside facilitated discussions, in a pilot in Niger. Evaluation found improved uptake of recommended handwashing and complementary feeding behaviours, and qualitative data indicated greater involvement of men in household and child-rearing responsibilities. SPRING rapidly scaled up the CV approach to 248 villages in Niger and 90 villages in Burkina Faso through collaborations with local partners, concept testing to adapt the videos to local contexts, and capacity building of video production hubs. Actions to support sustainability included exploration of income-generating opportunities of hubs and handover to ministry-led regional technical advisory groups.

Introduction

In rural areas in the Sahel, where populations can be difficult to engage due to poor infrastructure, low levels of literacy and limited access to healthcare, innovative social and behaviour change (SBC) approaches can achieve rapid results (SPRING, 2016). The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project is a U.S. Agency for International Development (USAID)-funded five-year project committed to reducing anaemia and stunting among women and young children through the expansion and scale-up of effective social and behaviour change communication (SBCC) and nutrition-sensitive programmes. Community video (CV) is an SBCC tool that SPRING has introduced to address the unique needs of rural communities in the Sahel.

Building on a successful CV collaboration in India with Digital Green¹, SPRING adapted and assessed the effectiveness and scalability of a facilitated, community-led video approach to promote maternal, infant and young child nutrition (MIYCN) and hygiene in the Sahel. SPRING worked in partnership with local organisations, departments of health and communities to develop locally appropriate and relevant video content, build community capacity in nutrition and media expertise, and ultimately transfer ownership of the CV processes and equipment to local entities (SPRING, 2015)². Thanks to the strength of these partnerships, SPRING could quickly introduce CV into communities and rapidly move beyond the pilot phase to scale-up.

This article explains how SPRING adapted and implemented the CV approach from pilot to scale in the resilience setting of the Sahel and examines challenges encountered and lessons learned in the process.

Context

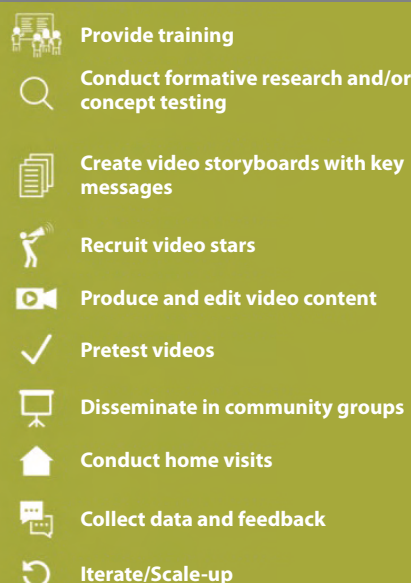
Harsh climatic conditions in the Sahel contribute to structural food crises and high rates of severe acute malnutrition among children. Frequent shocks, including conflict, drought and food shortages, necessitate flexible and resilient interventions. Communication approaches to address the nutrition, health and livelihood needs of Sahel communities must also be rapid, flexible and easily adaptable to the context of the target community.

In 2013, SPRING collaborated with Digital Green to test the feasibility of their “human-mediated digital learning approach,” which was developed to promote improved agricultural behaviours to stimulate high-impact nutrition and hygiene practices in India. The study found the approach to be promising for adaptation and scale-up in other contexts, such as the Sahel (Kadiyala et al, 2014).

SPRING’s main focus in the Sahel was to ensure that nutrition and hygiene – critical underpinnings of health, productivity and resilience – receive the attention they deserve through expanded SBCC programming. Following recommendations from a landscape analysis in 2014 of SBCC-related activities in Niger and Burkina Faso, which suggested introducing low-cost communications technologies in the resilience context, SPRING chose to focus on CV in the region

¹ <https://www.digitalgreen.org/>

² SPRING’s implementing partners were: Resilience and Economic Growth in the Sahel – Enhanced Resilience (REGIS-ER); Livelihoods, Agriculture, and Health Interventions in Action (LAHIA); the Initiative d’Accélération des Objectifs du Millénaire pour le Développement (IAOMD) project; the Sawki Project; the Programme d’Appui à la Sécurité Alimentaire des Ménages-Tanadin Abincin Iyali (PASAM-TAI) project; Families Achieving Sustainable Outcomes (FASO) project; Victory against Malnutrition (ViM) project; Resilience and Economic Growth in the Sahel-Accelerated Growth (REGIS-AG); and the Ministries of health in Niger and Burkina Faso.

Figure 1 SPRING CV approach

(SPRING, 2014). The study also recommended that programmes focus on critical underlying determinants, such as gender roles and cultural norms that affect livelihoods, income and the ability of families to improve their nutritional status. Based on these findings, SPRING adapted and assessed the effectiveness and scalability of a facilitated, community-led video approach to promote nutrition and hygiene in Niger.

Description of the CV approach

CV is a tool for nutrition and health behaviour change which blends technology (portable pico projectors and speakers) with interpersonal communication (human-mediated discussion groups and subsequent home visits). The CV approach is grounded in formative research of the local context, which SPRING uses to identify and prioritise sets of key behaviours for improved nutrition. Based on that research, SPRING and its partners develop packages of practices (POPs) for each behaviour. These POPs contain key behaviours to be adopted in the form of questions and answers in the video.

Videos are produced by small groups of community members called video production “hubs.” Hub members are briefed on key issues in nutrition, hygiene and agriculture and trained in video production. Community members serve as “actors,” creating clear ties to the community and increasing the likelihood that viewers will identify with the messages promoted and adopt the suggested behaviours. Often actors are early adopters of the recommended behaviours, which lends weight to their messages. The disseminations take place during community group meetings by a trained community-based mediator. Discussions during and after video screenings and subsequent home visits provide audiences with the opportunity to ask questions, give feedback and solve problems. Viewers are also encouraged to share the messages with their neighbours and families to increase the diffusion of the public health messages, spread awareness and change behaviours and social norms.

Figure 2 The CV process from pilot to practice (SPRING, 2014a)

Overview of project implementation from pilot to practice

When SPRING began SBCC interventions in the Sahel in 2015, an objective was set to launch a CV pilot, build evidence for the feasibility of the approach in a resilience context and scale up in a way that could be sustained by local governments and partners, technical advisory groups and video production hubs. Figure 2 outlines the steps to sustainability for CV in the Sahel from pilot to practice. Each of these steps is described in greater detail below.

Pilot: The foundation for scale and institutionalisation

SPRING consulted with stakeholders and established partnerships with local organisations to ensure that video content was appropriate and relevant and to transfer expertise to local entities. SPRING assessed existing literature and conducted formative research using focus group discussions and in-depth interviews with mothers, fathers, adolescents and grandmothers to identify key behaviours to emphasise in the videos. Initially, SPRING and partners implemented the CV approach in Niger in 20 villages in existing groups such as husband schools, mother-to-mother support groups, savings and loan groups and adolescent safe spaces. SPRING worked with Digital Green to train a local video production team and mediators on nutrition and hygiene, problem-solving video production and video dissemination. Ten videos were developed on high-impact nutrition and hygiene practices which were disseminated during community group meetings. A mixed methods evaluation was conducted to assess the feasibility, acceptability, effectiveness and costs associated with scaling up the pilot in Niger and Burkina Faso.

Scale-up: Transformation from pilot to practice

SPRING continued to collaborate with partners and local government in Niger to reach a total of 115 villages. SPRING also introduced CVs to 25 villages in the East Region of Burkina Faso. In both countries, SPRING and Digital Green organised trainings of trainers on video production, dissemination and MIYCN to ensure that capacity was transferred. As the programme

expanded to more regions, SPRING introduced concept testing to ensure video content was appropriate to the local context (explained further below). This phase was crucial to ensure ongoing capacity building of the video production hubs, quality of the CVs produced and respect for the overall approach (i.e., quality assurance visits, verification during dissemination and home visits, and data monitoring). The research aimed to enhance understanding of the pathways through which the project achieved its objectives and how the intervention could be adjusted to improve impact. In particular, the research aimed to reveal how videos influenced male involvement in nutrition and how community members shared messages with each other.

Practice: progress toward sustainability

SPRING continued to expand its reach to a total of 248 villages in Niger and 90 villages in Burkina Faso. In both countries, technical expertise and management was transferred to partners and government structures to promote sustainability of the intervention. SPRING continues to build partners' technical skills in all phases of video development, supervises activities and helps partners integrate elements of the approach into their overall action plans. SPRING is continuing to explore ways to better integrate the reporting system into partners' existing monitoring and evaluation (M&E) systems³. Finally, through collaboration with a local capacity and research firm, SPRING is investigating whether the video production hubs can become sustainable income-generating entities that provide their video services to interested local parties through a market-driven approach.

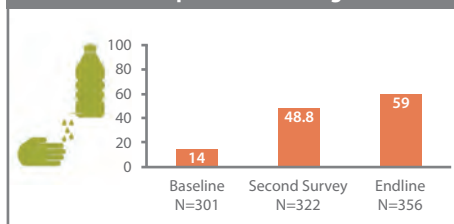
Challenges and lessons learned

Effectiveness

Evaluation of the pilot phase in Niger

SPRING's experiences in the Sahel have shown that CV is both effective in changing behaviours and widely accepted by communities. SPRING conducted a mixed-methods evaluation on the acceptability, effectiveness and scalability of the

³ Data related to the number of people participating in video dissemination as well as intention to adopt and/or promote key behaviours was originally collected using Digital Green's established monitoring techniques and data management tool COCO (Connect Online-Connect Offline).

Figure 3 Percentage of households with at least one designated place for washing hands

CV approach in Niger. Findings from the qualitative component of the study indicated that beneficiaries found the videos to be relevant and engaging and that they understood the messages being conveyed (SPRING, 2016a).

"The video gave us the final push to change. I already knew many things before through my husband's school, but it took us seeing the video to make a change."

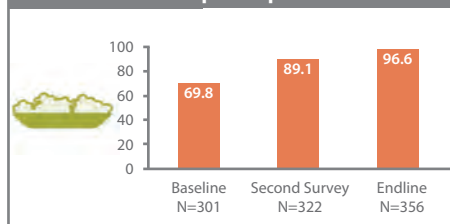
Female beneficiary (Maradi, Niger).

Importantly, audiences enjoyed interacting in discussions after the screenings and during home visits from mediators. Results from the quantitative survey showed an increase in knowledge, positive attitudes, self-efficacy and reported behaviour changes related to key handwashing and responsive feeding practices (key outcomes of interest). The survey found that the presence of a handwashing station at home increased from 14% at baseline to 48% after the handwashing video was shown and to 59% at endline, indicating that behaviour change was sustained and continued to rise after the videos were screened (see Figure 3). Among households with a handwashing station, those that had soap and water available at the station (indicating regular use) increased from 73.8% at baseline to 96.2% at endline.

The proportion of mothers who practiced responsive feeding of children aged 6-24 months and feeding from a separate dish also improved significantly. The percentage of children who were less than an arm's length away at the most recent meal (a good responsive feeding practice) increased from 64.5% at baseline to 79% at endline. The percentage of women who fed their child from a separate plate increased from 69.8% at baseline to 96.6% at endline (see Figure 4). Qualitative findings also showed that the videos fostered improved communication and gender equity within households; couples reported that the videos served as conversation starters, encouraged men to help with child care beyond providing financial support, and led couples to imitate the positive behaviours that they saw (SPRING, 2016). The CV approach was well received by programme participants, who expressed appreciation that the content reflected behaviours and conditions relevant to their lives and that the actors were native speakers of Hausa, the local language.

"The women are very enthusiastic because the actors are villagers like them and speak Hausa. This has had a great effect and resulted in significant behaviour change."

Female mediator (Maradi, Niger).

Figure 4 Percentage of women who fed their child with a separate plate for each meal

The importance of involving men

Sustained change in household nutrition practices requires the participation of men. Men often play a leading role in decision-making on household matters, but their involvement in promoting nutrition practices is limited mostly to providing food and resources. In Niger, this is especially true, with men principally responsible for providing food and financial support, while women are responsible for preparing food, caring for children and fetching wood and water. Although the latter are regarded as women's tasks, men still decide when and how a woman will do them. Men's role in this shared responsibility makes them important influencers who need to be engaged to improve nutritional practices in the household (Dougherty, 2016).

During the scale-up phase, SPRING conducted qualitative research on how CV can be used to strengthen spousal communication and improve male involvement in MIYCN behaviours. It was found that the videos helped encourage spousal communication in a context where this type of communication is not common. Fathers responded favourably to the male behaviours depicted in the videos, which couples sought to emulate. Thus, the videos promoted a more family-focused approach to child nutrition and care, moving from the mother-child dyad to a more comprehensive form of care that includes the father. Research did not, however, show a clear difference in dialogue between couples in which both partners attended video disseminations and those in which only the wife attended.

Ability to scale

The need for collaboration of partners for successful implementation

CV complements many other interventions to improve nutrition and hygiene in the region, and partnerships and collaboration are key for success and sustainability. Not only did partnerships allow SPRING to integrate CV into ongoing programming, they also created an environment for partners to pool their technical expertise, including extensive knowledge of the local context. Partner trainers from the non-governmental organisation (NGO) sector and government have been vital for rapid scale-up. SPRING trained 35 trainers in total, who in turn trained community volunteers. In addition, SPRING worked increasingly closely with the government to strengthen the programme's sustainability and scale-up in villages where NGOs are absent.

While collaboration has been crucial to the success of these programmes, it has also brought challenges. Partners had varying commitment levels, as well as differing goals, processes and implementation plans. For example, data collection proved difficult within a consortium of partners each with its own M&E systems. A programme's ability to integrate a community media M&E system into its existing M&E depends on staff capacity and time, as well as the indicators it already collects. Additionally, low literacy meant that mediators could not always collect data on behaviour adoptions or knowledge recall, which in some cases meant that partner NGOs had to make additional home visits to collect data in a smaller sample of homes.

The success of concept testing

During the pilot phase, SPRING conducted formative research in Maradi, Niger, which informed how the videos were adapted to the local context (Moreaux, 2015). As more diverse video themes were introduced in new regions of Niger and Burkina Faso, SPRING focused on concept testing as a quick and efficient way to ensure that the videos were well adapted to the local context. Concept testing does not replace the process of pretesting videos, but instead resembles product testing; planners mock up an idea and observe how potential consumers react to it.

SPRING used concept testing in both countries to learn which storylines and emotions work best, which characters are most persuasive, how one or two "facts" make the case for people to practice a behaviour, and which benefits of practicing the behaviour are the most compelling. In any given intervention village, three possible stories (concepts) are tested with a subset of the target population.

Concept testing involves working directly with the community to choose the most appropriate storylines, request additional video content and further contextualise key information. The hubs then use community feedback to tailor the final storyline while ensuring technical accuracy by tying stories to the POPs. Videos showcase local early adopters of recommended behaviours who practice these behaviours in their own homes and villages to engage the community and make the content more relevant and relatable.

Concept testing has been successful with partners in both countries in encouraging beneficiaries to be involved in choosing the best way to provoke behaviour change. Partners, hubs and local SPRING community field agents have been trained on concept testing.

Reduced costs on scale-up

Results from the cost analysis indicate that costs drop considerably as pilot interventions are taken to scale. The costs associated with expanding the intervention from 1,500 to 7,500 beneficiaries and introducing new video content was US\$304,887. Thus, the cost per beneficiary declines from US\$16.19 to US\$4.13 per person reached; from US\$28.91 to US\$7.26 for the

Filming in Bogande, Burkina Faso, for the Community Video Project, 2016



handwashing station behaviours changed; and from US\$36.24 to US\$9.10 for the separate plate behaviour. Although it is not possible to compare cost estimates from previous studies because different investigators used different assumptions, the price per behaviour change can be placed in context with similar interventions. For example, studies considering the cost of using women's groups to reduce child mortality found a range from US\$22 per year of life saved to as much as US\$393 (Farnsworth et al, 2014). Options are being explored for video production hubs to generate income, which would further increase the long-term sustainability of the programme (examined further below).

Sustainability

Capacity building of the video production hubs

Building the capacity of local video production hubs is crucial for transitioning from a pilot intervention to a sustainable programme. Video production hubs in the Sahel consist of local private entrepreneurs who receive training and mentoring from SPRING in nutrition and video production (concept testing, storyboarding, shooting and editing). SPRING or its implementing partners contracted the hubs to develop videos; an arrangement that provided a flexible, affordable messaging channel for local partners and an initial source of income.

The hubs make up a network of video production teams. In Burkina Faso, two out of the three originated from local radio stations, while in Niger, four independent video teams were established. SPRING provided training and support to the local video production teams.

SPRING is working with a local research firm to explore the market favourability and the long-term viability of the hubs as entrepreneurial entities in Niger and Burkina Faso. The firm is assessing the potential for making the hubs independent, regional outposts of existing video production firms and how to connect them to local NGOs or other entities to extend their reach. The firm trained the hubs on business planning, accounting, marketing and grant writ-

ing. Although too early to confirm whether this investment in local video production will result in sustainable CV production resources, the project learned some important lessons:

- Because hubs tend to be more confident in shooting the video than in analysing the POPs or conducting concept testing, it is important to reinforce the initial video production training with refresher trainings on how to ensure that videos are conveying the right messages and are effective in changing behaviour;
- Some hubs are already part of an existing structure, such as a radio station, so they cannot become independent business entities. Others are eager to branch out and create a business; however, this will require more support in basic activities such as registering their business and opening a bank account;
- The Sahel is an extremely tough terrain and climate with little infrastructure, which can make working with technology challenging. While equipment held up well in general, SPRING had to replace some equipment and experienced challenges in shipping equipment. Although the equipment SPRING uses is available for purchase in-country, it is far more expensive, posing challenges for hubs to maintain or replace equipment.

Dissemination through mobile phones

Maximising mobile phone technology could help to further disseminate CVs; however, the current videos take up too much space to be shared via mobile phone. The greatest benefit would be where mobile phone coverage is already high. SPRING is currently looking into access to mobile phones and considering ways to reduce the size of videos and provide them on sim cards which can be inserted into mobile phones. SPRING will also look into other methods of “viral dissemination” in the future.

Technical advisory groups to ensure sustainability

In the absence of an existing government-led body in the two regions where SPRING has a presence in Niger, two technical advisory groups (TAGs) were established. These have members from partner NGOs, the Scaling Up Nutrition (SUN) Movement, a regional cell responding to crises and the relevant regional directorates. Members meet every two months to decide on new video topics, approve produced videos and oversee the quality of the video production process. Initially, these groups were led by SPRING but now the regional Directorates of Health, with the support of a partner project, are taking the lead and are expected to continue to meet and monitor CV activities after SPRING closes.

Originally, video themes were chosen based on formative research findings. However, TAG members decided to start producing videos on topics beyond nutrition and WASH, such as agricultural practices, animal husbandry and family planning. For example, one partner re-

quested a video promoting purdue-improved cowpea storage (PICS) bags for storing beans.

Since the TAGs are regional, the groups are well prepared to rapidly scale up coordination if an emergency arises. This rapid response could help avoid negative coping strategies among the population. For example, in January 2017, when scarce rain and a locust infestation damaged harvests, the TAG brainstormed what those affected could do to avoid hunger. Suggestions included “continued breastfeeding beyond 24 months” and “vegetable production in a kitchen garden.”

Conclusion

CV is a rapidly scalable SBCC intervention which can be sustained by creating and building the capacity of government, partners and hubs. The CV approach has helped encourage men to take a more active role in supporting women in household and child-rearing responsibilities, thus improving MIYCN behaviours. However, some barriers still need to be addressed, including procuring and maintaining equipment and partner collaboration. Overall, the CV approach was well received and represents a promising model in the Sahel. As part of a wider set of interventions within an SBCC strategy for resilience contexts, CV can be effective at promoting nutrition-specific (MIYCN and hygiene) behaviours.

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References

- Dougherty L, 2016. *The Father Factor: How CV can encourage male involvement for Nutrition and hygiene behaviours in Niger. Evidence from the SPRING CV Experience*. Arlington, VA: Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project.
- Farnsworth SK, Böse K, Fajobi O, Souza PP et al, 2014. *Community Engagement to Enhance Child Survival and Early Development in Low- and Middle-Income Countries: An Evidence Review*. Journal of Health Communication 19(1): 67–88. <http://doi.org/10.1080/10810730.2014.941519>
- Kadiyala S, Roopnaraine T, Margolies A and Cyriac S, 2014. *Using a Community-Led Video Approach to Promote Maternal, Infant, and Young Child Nutrition in Odisha, India: Results from a Pilot and Feasibility Study*. Arlington, VA: USAID and SPRING.
- Moreaux M, 2015. *Informing video topics and content on MIYCN and handwashing: Situational analysis and formative research in Maradi, Niger*. Arlington, VA: USAID and Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project.
- SPRING, 2014. *SBCC in the Sahel: A Landscape Assessment of Nutrition and Hygiene Social and Behaviour Change Communication in Niger and Burkina Faso*. <https://www.spring-nutrition.org/publications/reports/sbcc-sahel>
- SPRING, 2014a. *From Pilot to Practice: Lessons on Scale, Institutionalization and Sustainability from the (In-Progress) Journey of the SC4CCM Project*, September 2014
- SPRING, 2015. *CV for Nutrition Guide*. <https://www.spring-nutrition.org/publications/series/community-video-nutriti-on-guide>
- SPRING, 2016. *Seeing is Believing*. The Strengthening Partnerships, Results, and Innovations in Nutrition Globally Project.
- SPRING, 2016a. *Community Media: Principles in Practice. Highlights from SPRING's Experience Using Community Media in a Resilience Setting*. Arlington, VA: Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project.

By Judith Kabore and Laure Serra



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The authors would like to warmly thank their colleagues from civil society throughout West Africa for their fruitful collaboration as well as their continuous commitment in the fight against malnutrition.



Advocating for nutrition in West Africa: The role of SUN Civil Society Alliances

Location: *West Africa*

What we know: Country-level Civil Society Alliances (CSAs) are a key part of the collective action of the Scaling Up Nutrition (SUN) Movement that advocates to inform and influence government action on nutrition.

What this article adds: In 2013, Action Against Hunger began a three-year programme to build advocacy capacity of CSAs within the West African region and facilitate sharing of advocacy knowledge and experiences. Local civil society actors from 12 countries created a Nutrition Champions Network. Events included three regional workshops themed on advocacy training and lesson learning (2013), budget advocacy and training (2015), and policy analysis, influence and monitoring (2017). Multi-sector advocacy and integration of nutrition objectives into other relevant sectors were cross-cutting themes. Synergies were identified with international initiatives. In 2017 a common regional advocacy workplan for the SUN CSAs in West Africa was agreed, to be delivered in 2017/18. Best practice and country experiences were shared through the Nutrition Champions Network, aided by exchange visits between countries. Challenges include accessing nutrition budget data, monitoring political commitments and lack of funding to sustain the CSAs. Implementation of the action plan and identifying funds are critical next steps.

Introduction

About one million children under the age of five die each year from undernutrition-related causes (Black et al, 2008). Recent estimates show that malnutrition rates remain worryingly high across countries in West Africa. The prevalence of child stunting equals or exceeds 40% in eight countries in the region. More than 16 million children under five are chronically malnourished and 4.6 million children are affected by severe acute malnutrition (SAM) (IFPRI, 2016). It is crucial that assistance is delivered to vulnerable populations to prevent and treat malnutrition and to ensure that every person can fulfil their full potential. As a complement to operational assistance, advocacy is key in the fight against malnutrition. Advocacy enables civil society actors to voice their expectations and priorities and create an enabling environment for the reduction of malnutrition.

All countries in West Africa, with the exception of Cape Verde, are members of the Scaling Up Nutrition (SUN) Movement, which brings together people from governments, civil society,

the United Nations (UN), donors, businesses and research institutions in a collective effort to improve nutrition.¹ Civil Society Alliances (CSAs) are formed between civil society organisations (CSOs) at country-level to align strategies, programmes and resources with country plans for scaling up nutrition, supported by the global-level Civil Society Network (CSN). In this context, Action Against Hunger began a three-year programme in 2013, funded by the French Development Agency (AFD), to build the advocacy capacity of CSAs within the region and facilitate the sharing of advocacy knowledge and experiences. Local civil society actors from 12 countries (Burkina Faso, Chad, Guinea, Ivory Coast, Liberia, Madagascar, Mali, Mauritania, Niger, Nigeria, Senegal and Sierra Leone) were gathered to create a Nutrition Champions Network. Their role was to mobilise other stakeholders to act together against malnutrition, create and implement local advocacy plans, influence policies for nutrition, share experiences and participate in country learning exchange visits. All materials and training are delivered in French and English in order to strengthen

regional coherence among English and French-speaking countries.

Regional workshops

Several key events were organised as part of the programme, including week-long regional workshops that gathered approximately 25 members of the CSAs. The first workshop took place in October 2013 and aimed to strengthen the capacities of CSA members through expert advocacy training and the sharing of knowledge and experiences. Advocacy training sessions included subjects such as the advocacy cycle, advocacy targets and tactics and how to advocate within the media and parliament. The second workshop took place in 2015 with the theme of budget advocacy, during which training aimed to build capacity in national budget analysis. It is crucial to get accurate national data on the domestic and international budget allocated to nutrition. As nutrition is multi-sectoral, budget analysis methodologies need to capture expenditure on both nutrition-specific and nutrition-sensitive

¹ www.scalingupnutrition.org



SUN Civil Society Training Session in West Africa

activities. Civil society actors are encouraged to conduct 'budget advocacy', to build their messages on quality evidence and to hold government to account. Budget advocacy includes knowledge of the budget cycle, analysis of budget lines of various ministries, meetings with government representatives and parliamentarians, participation in budget definition and budget audit. Action Against Hunger and partners have developed a manual and e-learning to support civil society in engaging in this technical and crucial process.

The third workshop was held in 2017. Training focused on the analysis, influence and monitoring of public policies, which are at the core of the civil society role, including power mapping, analysis and setting targets and developing materials for reaching all audiences. Using the Action Against Hunger advocacy toolkit² and other advocacy tools, such as the RESULTS advocacy tools³, the training combined theoretical learning with case studies, group and individual exercises and role play.

A central theme of all workshops was the value of multi-sector advocacy and how to best integrate nutrition objectives into other relevant sectors, such as health, agriculture and water, sanitation and hygiene (WASH). During the 2017 workshop, a session on the multi-sector dimension of nutrition built on previous learning. Participants learned how to influence national agricultural plans to make them nutrition-sensitive, as well as how to integrate WASH issues into a nutrition strategy. These gatherings also triggered discussions on international initiatives, such as how to engage with the SUN Movement and the SUN CSN Secretariat, how to identify opportunities to work together with the African Leaders for Nutrition initiatives, and information on the 'No Wasted Lives Initiative'.⁴ This is important to make sure that information is shared at all levels and to identify synergies between global advocacy and national initiatives. At national level it is also crucial to support SUN CSAs in the building of successful working relationships with SUN Government Focal Points and their multi-stakeholder platforms. These regional-level workshops enabled CSAs from the 12 countries in West Africa to gain useful expertise and knowledge of tools which they can then apply at national level, depending on specific contexts and priorities.

Advocacy priorities for SUN CSAs in West Africa

The latest meeting in 2017 between these 12 West Africa SUN CSAs provided them with the opportunity to agree common priorities and concrete actions on advocacy for nutrition. Participants developed a common regional advocacy workplan for the SUN CSAs in West Africa with the following key objectives:

- *Improve government accountability to meet political and financing commitments for nutrition:* Many commitments have been made by governments at international, regional and national levels that have not so far been respected. It is therefore important to highlight all commitments made and hold decision-makers accountable for reaching them.
- *Improve financing for nutrition in West Africa through funding of national nutrition policies and sector policies:* Domestic financial resources are key to improving the nutrition situation of populations and funding interventions for treatment as well as prevention.
- *Elaborate, implement and monitor public policies that are influenced by civil society in favour of nutrition:* Nutrition-sensitive public policies in all sectors (including agriculture, WASH and health) contribute to creating an enabling environment for nutrition.
- *Strengthen civil society capacities in West*

Africa to speak with one voice: CSOs are major actors in pushing for the recognition of malnutrition and for the mobilisation of decision-makers; therefore the technical and financial advocacy capacities of CSOs must be reinforced.

For each key objective, specific common advocacy activities were identified to be carried out by the regional SUN CSA network during 2017 and 2018. Activities include the development of common advocacy documents for World Bank meetings and Economic Community of West African States (ECOWAS) Forums, thematic advocacy documents on the Sustainable Development Goals (SDGs), engagement meetings with parliamentarians, participation in revision of national agricultural plans, and country peer visits and contributions to the SUN Global Gathering. These activities are complemented with indicators to enable the monitoring of the group's progress and achievement. To implement these activities, the Action Against Hunger West Africa Office supports the coordination and flow of information among CSA focal points. A monthly call is facilitated to provide updates on recent developments and upcoming activities. The network is self-sufficient and relies on common will to learn from others and share national experience.

Sharing advocacy country experiences

Through this Nutrition Champions Network it is also possible for actors involved to share best practices and feedback on national experiences. Learning from experiences between peers may be the best way to advance advocacy, avoid duplication of effort and make relevant decisions (see Box 1 for Nutrition Champion feedback). The following provides examples of the kind of national experiences that are shared:

The SUN CSA focal point in Mali shared his experience of creating a network of parliamentarians in favour of nutrition, which has been

² www.actioncontrelafaim.org/fr/actualites/publications

³ www.results.org/skills_center/activist_toolkit/

⁴ https://www.nowastedlives.org/

⁵ Available on request from the Action Against Hunger West Africa Regional Office, Iserra@wa.acfspain.org



Participants of a SUN Civil Society Alliance training workshop



Group work at a SUN Civil Society training workshop in West Africa

active since 2015. Parliamentarians are invited to request the government to implement its international commitments for nutrition, follow the implementation of the National Nutrition Policy by 2021, and adopt new legislative measures in favour of nutrition (such as gratuity of care for nutrition, which enables children under five years of age to get free treatment for malnutrition in health centres). This has been useful for other countries, such as Niger, where a network of parliamentarians for nutrition is being created.

Representatives from Sierra Leone, Burkina Faso, Senegal and Mauritania gave examples of influencing their government to increase the nutrition budget with development of a specific nutrition budget line to help track this. In Burkina Faso the SUN CSA has advocated for this since 2015. Building on these country experiences, the Senegal SUN CSA, Action Against Hunger and Save the Children (SC) produced a manual for budget advocacy that can be used for any SUN CSA who wants to engage in similar long-term advocacy.

In Senegal, the SUN CSA platform, together with the Food and Agriculture Organization (FAO) and Action Against Hunger, organised a two-day training for civil society actors, including small producers, to strengthen their capacities to link agriculture and nutrition. This enabled them to influence the National Agricultural Investment Plan, which is being revised by the

government, and to ensure that the nutrition dimension was well accounted for. They agreed on a common declaration including clear advocacy messages to be used by all actors in the process.

A very recent experience is the creation of the SUN civil society platform in Liberia. Civil society actors have been active since 2013 and have advocated together for nutrition. Liberia has benefited from the experience of established CSAs and has been inspired by their example.

To support the sharing of country-level experiences, exchange visits have also taken place between Burkina Faso and Niger; Burkina Faso, Mauritania and Guinea; and Burkina Faso and Chad. Consequently, the SUN CSA was created in Burkina Faso; a strategy for community awareness on undernutrition has been strengthened in Mauritania and Guinea; and a common advocacy strategy has been drafted between Niger and Burkina Faso.

Challenges and next steps

Challenges are faced by SUN CSAs at national level and within the regional network. The SUN CSAs discuss these challenges during the regional workshops and monthly phone calls and propose solutions to overcome them.

One common issue SUN CSAs face is the difficulty in accessing information on nutrition

budgets and monitoring political commitments (such as Nutrition for Growth commitments) by governments and international donors. Data are rarely accessible and reliable and representatives must invest time and resources to get this evidence to build their advocacy. This can be improved by following thorough budget-advocacy steps or targeting relevant actors who are likely to keep this information.

Another difficulty is the lack of financing for SUN CSAs. They depend on funding from donors (including the Multi-Partner Trust Fund (MPTF) and the New Venture Fund), which is rarely long-term funding and does not support all the CSAs. This prevents SUN CSAs from conducting longer-term advocacy activities and sustaining their efforts by building on previous work through thorough monitoring. Likewise, the regional coordination of the network is not funded and is currently managed by Action Against Hunger on top of other activities. This regional dimension is of utmost importance for the SUN CSN and should be reinforced to allow optimal coordination and achieve impact at national level.

In terms of next steps it is crucial that the action plan of West Africa SUN CSAs is implemented through 2017 and 2018. This will consolidate the regional network and capitalise on the current dynamic. It is also important to define a clear funding strategy to support a continuation of this work and to facilitate more of the much appreciated regional workshops.

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References

- Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, Mathers C, Rivera J. Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet* 2008, 371:243-260.
- International Food Policy Research Institute (IFPRI) (2016) Global Nutrition Report 2016: From Promise to Impact: Ending Malnutrition by 2030. Washington, DC.



Members of SUN Civil Society Alliances in West Africa

What does nutrition-sensitive programming mean for WFP?

By Kathryn Ogden, Geraldine Lecuziat, Mutinta Hambayi, Quinn Marshall, Ali Elnawawi and Josephine Lofthouse (WFP nutrition team, Rome)

The WFP team acknowledge colleagues from IFPRI (Deanna Olney, Aulo Gelli, and Lilia Bliznashka) who supported the development of the programme impact pathways and seven opportunities. (Technical report: Making WFP's Programmes More Nutrition-Sensitive).

Background

The new nutrition policy¹ of the World Food Programme (WFP) articulates its role in supporting governments to achieve Sustainable Development Goal (SDG) 2. It emphasises the need to integrate nutrition across WFP's work in order to address the multiple burdens of malnutrition facing vulnerable groups. The potential impact of nutrition-sensitive programming in WFP is significant: WFP served 76.8 million people in 81 countries in 2015 (WFP, 2015), many of whom were in hard-to-reach places. The policy has three key messages:

- WFP can make a significant contribution to eliminating all forms of malnutrition through nutrition-sensitive programming.
- Both nutrition-specific and nutrition-sensitive interventions are key in accelerating progress towards ending malnutrition in all its forms.
- Humanitarian nutrition-specific responses will remain a central feature of WFP's work but are to be reinforced with nutrition-sensitive approaches.

This new policy reflects key changes in the global context. The 2013 Lancet Nutrition Series showed that implementing large-scale, proven, nutrition-specific interventions alone will only reduce stunting by 20% (Bhutta et al, 2013), leaving an 80% 'black box' which can only be addressed through nutrition-sensitive programming. We now know that one in three people globally is malnourished (IFPRI 2016), while 138 of 140 countries with data are facing single or multiple burdens of stunting among children, anaemia among women of reproductive age, or overweight among women (IFPRI 2016). Lastly, diet is the number one driver of the global burden of disease (Forouzanfar et al, 2015). WFP's nutrition policy puts forward an integrated approach to nutrition that aims for adequate and healthy diets for vulnerable groups of all ages.

Nutrition-sensitive programming in WFP

Many of WFP's programmes target poor and nutritionally vulnerable individuals and households and address immediate determinants of nutritional status (e.g. diet), as well as underlying determinants such as household access to food and care practices. WFP has identified four key programme areas that address some determinants of malnutrition:

- General food assistance.

- School meals, which reached 17.4m children in 2016.
- Smallholder agricultural market support programmes, which support smallholders to gain access to formal markets.
- Food assistance for assets, which addresses immediate food needs through cash, voucher or food transfers while promoting the building or rehabilitation of assets that will improve long-term food security and resilience.

A nutrition-sensitive food assistance for assets programme might, for example, build latrines or water points as the community asset; a school meals programme may involve building kitchen infrastructure or latrines; or cash transfers may be conditional on attending health centre check-ups. Improved water, sanitation and hygiene practices, care practices and knowledge may also be part of these programmes; all will be supporting improvements in dietary diversity and nutritional outcomes. In addition, through its partnerships with governments and others, WFP improves the enabling environment through supporting nutrition governance and policy formulation, multisector coordination, and better targeting, analysis and monitoring.

A nutrition-sensitive programme can also be used as a platform to scale-up nutrition-specific actions that address the immediate determinants of malnutrition. National social protection

programmes, which are implemented on a large scale and target the most vulnerable people, also represent an important opportunity for delivering nutrition-sensitive programming.

For WFP, this means an organisational shift, broadening our nutrition focus beyond traditional treatment and prevention programmes beyond calories to nutrients. Programme colleagues will need support and guidance to do this.

Unlocking WFP's potential: Guidance for nutrition-sensitive programming

Recently released WFP guidance, developed in partnership with IFPRI, aims to demystify what nutrition-sensitive means practically for WFP's country office programmes. Programmes are encouraged to articulate how their interventions will influence nutrition outcomes by developing programme impact pathways which include inputs, activities and outputs and identify enabling and constraining factors and the means of addressing them. The guidance develops a set of minimum requirements (see Figure 1). Seven opportunities to increase nutrition-sensitivity across programmes have been identified (see Figure 2). The process to design nutrition-sensitive programmes is structured around four key steps following the logic of the project cycle:

1. Understanding the nutritional situation for vulnerable life cycle groups and the drivers for malnutrition.
2. Formulating and jointly planning the programme strategy across WFP sectors and key stakeholders and targeting nutritionally vulnerable groups.
3. Selecting key opportunities to enhance nutrition-sensitivity of the programme.

¹ <http://documents.wfp.org/stellent/groups/public/documents/eb/wfp289329.pdf>

Figure 1 Minimum requirements for nutrition-sensitive programming

Programmes must comply with these 5 requirements

Incorporate a nutrition objective, outcomes and indicators.

Improve dietary intake for women of reproductive age in districts X, where FFA programmes are operating by, 2020

Be informed by a comprehensive gender and nutrition situation analysis & focus on key nutritionally vulnerable groups across the life cycle.

What is the nutrient gap? Is there an issue of availability and access to nutritious food, or demand, or both? What gender issues may be contributing to poor diets for women?

Include deliberate nutrition actions and/or provide appropriate delivery platforms to ensure the project will contribute to achieving the identified nutrition objective.

Choose most applicable from the 7 key NS opportunities. For example:

- Incorporate SBCC
- Select assets that increase availability of fish, vegetables, fruit, etc.

Tackle gender inequality and lack of nutrition knowledge.

Have we chosen assets that strengthen livelihoods for women? Do communities know how to prepare nutritious meals?

Be aligned with national nutrition plans where they exist. Partnerships and policy engagement must be supported to foster a more nutrition-sensitive enabling.

Are there other partners providing services needed by the women we are working with who we can link with? WASH or health?

4. Measuring and monitoring progress and tracking unintended positive and negative effects.

Coordination and collaboration with government, partners and other sectors are essential within each step. WFP engagement with governments includes advocating for inclusion of nutrition-sensitive actions in national and/or sector strategies and developing joint annual action plans, facilitating links across ministries, and contributing to coordination platforms and fora.

The WFP guidance outlines a pathway showing some of the linkages between inputs, activities, outputs, outcomes and impact, emphasising two critical mediating factors (gender equality and women's empowerment as well as nutrition knowledge) and an enabling environment for sustainable progress and how WFP programming may influence nutrition.

WFP is committed to integrating gender equality and women's empowerment into all its work. Beyond the importance of those outcomes in their own right, they also help to ensure that the nutrition needs of women, men, girls and boys are met. Nutrition-sensitive programme design and implementation should be gender-sensitive as a minimum requirement and, when possible, gender-transformative, with the aim of changing existing structural inequalities.

The Programme Impact Pathway helps country offices map out possible causal pathways to improved nutrition outcomes. The guidance also recognises the opportunity to improve communities' nutrition knowledge; this may involve simpler messaging, education or social behaviour-change communication activity and can be delivered by WFP or a partner.

Securing uptake of the guidance

The guidance is being disseminated to programme colleagues in regional bureaux, coun-

Figure 2 Seven key opportunities for nutrition-sensitive programming

Opportunity 1	Target nutritionally vulnerable groups – as primary or secondary target groups
Opportunity 2	Add or link to nutritionally-relevant complementary activities – through integration or co-location
Opportunity 3	Ensure adequate quantity and nutritional quality of the food, commodity voucher or cash transfer
Opportunity 4	Make transfers conditional
Opportunity 5	Contribute to community, household or school assets that are nutritionally-relevant and ensure adequate scale, quantity and quality of the asset
Opportunity 6	Align with national nutrition action plans and strategies, and advocate for nutrition
Opportunity 7	Apply a gender and protection lens

try offices and headquarters. The nutrition-sensitive team in WFP's Nutrition Division are seeking feedback on the guidance and nutrition-sensitive programmes to ensure that it is refined over time with new evidence and best practices as well as the latest global evidence. We are also developing training materials to support its uptake.

The team is also seizing opportunities to influence country strategies and programmes. The development of WFP Country Office five-year Country Strategic Plans (CSPs) offer a key opportunity. The CSP, which is informed by a comprehensive analysis of the context in partnership with government and partners, defines WFP's entire portfolio of assistance within a country, including strategic outcomes and activities for both protracted crises and humanitarian needs, as necessary. The CSP highlights how WFP supports countries to achieve national results and SDG targets focusing on SDG 2 and SDG 17. Bringing nutrition-sensitive analysis and planning in at this stage could make a tremendous difference to nutrition outcomes.

Nutrition colleagues within WFP would welcome your experiences in making organisations or programmes more nutrition-sensitive. We will be gathering evidence and case studies on our progress and look forward to sharing those with you.

For more information, contact:
HQ.nutrition-sensitive@wfp.org and/or
kathryn.ogden@wfp.org

References

- Bhutta, et al, Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? The Lancet, Volume 382, Issue 9890, 452-477.
- Forouzanfar et al, 2015. *Global, Regional, and National Comparative Risk Assessment of 79 Behavioural, Environmental and Occupational, and Metabolic Risks or Clusters of Risks in 188 Countries, 1990–2013: A Systematic Analysis for the Global Burden of Disease Study 2013*. Lancet 386 (10010): 2287–2323.
- IFPRI 2016. International Food Policy Research Institute. 2016. *Global Nutrition Report 2016: From Promise to Impact: Ending Malnutrition by 2030*. Washington, DC.
- WFP 2015. World Food Programme Annual Report 2015.

WHO's new emergencies programme bridges two worlds¹



This Q&A with Peter Salama, Executive Director of the World Health Organization (WHO) Health Emergencies Programme, explores how the new initiative is changing the way the agency helps countries prepare for and respond to health crises. The programme aims to create a single workforce, budget, set of rules, process and one clear line of authority to support WHO country offices to respond to emergencies. An incident management system allows information to be better shared across WHO and a new Contingency Fund for Emergencies enables an initial tranche of money to be delivered within 24 hours of the request for quicker deployment of people and finance. WHO was heavily criticised for its response to the 2014–2016 Ebola virus disease (EVD) outbreak in West

Africa. Since then, under the new programme, WHO has delivered quicker and more effective responses; for example to the outbreak of Zika in Latin America, food insecurity in northern Nigeria and outbreaks of Rift Valley fever on the Mali-Niger border.

The WHO programme will be helped by a new set of procedures recently finalised with the Office for the Coordination of Humanitarian Affairs (OCHA). These provide criteria for when OCHA should activate the humanitarian system in response to a major infectious disease outbreak. During the EVD outbreak, the cluster system was not activated when it should have been, which hampered the coordination of the response. Under the new procedures, it will be

clear from the outset of an outbreak whether the health and other clusters should be activated and what their roles should be. As coordinator of the health cluster, this will help WHO provide a much more effective role in bridging the worlds of infectious diseases and humanitarian relief to provide an effective response.

Going forward, WHO seeks to combine its technical and normative comparative advantage with its renewed operational capacity to provide a more systematic response in emergency situations; a more predictable partner in humanitarian situations in 2017 and beyond.

¹ Bulletin of World Health Organisation 2017;95:pp8-9. WHO's new emergencies programme bridges two worlds. www.who.int/bulletin/volumes/95/1/17-030117/en/

#SenegalNutrition



Great progress has been made in the fight against malnutrition in Senegal over the last 15 years. Due in part to government commitment to multi-sector nutrition programming, the stunting prevalence rate fell from 29.5% in 2000 to 19.4% in 2014. To capitalise on this gain, a national nutrition policy was launched in 2015 and now the government is on the brink of releasing a new, multi-sector, strategic nutrition plan.

SecureNutrition has taken up the call to support the Government of Senegal's efforts by launching an information hub, www.securenutrition.org/senegal, and social media campaign, #SenegalNutrition, to encourage investment in nutrition in Senegal. SecureNutrition will also be hosting a new technical series, *Analysis & Perspective: 15 Years of Experience in the Development of Nutrition Policy in Senegal*, on nutrition policy, political economy, financing, capacity and scale-up throughout 2017.

These efforts support Senegal's nutrition coordination unit, Cellule de Lutte Contre la Malnutrition (CLM), which is housed in the Office of the Prime Minister and led by the Scaling Up Nutrition (SUN) country focal point. Learn more about the efforts of the CLM by reading an interview in *Nutrition Exchange* Issue 7² or listening to a podcast on the ENN Media Hub³; a conversation between Ambarka Youssoufane, ENN's regional West Africa knowledge management specialist, and Abdoulaye Ka, CLM National Director and Senegal SUN Focal Point.

Media Hub



Listen to an interview with the authors on the ENN podcast channel:

www.enonline.net/mediahub/increasingfundingfor-nutritiontheroleofadvocacyandcommunicationin-senegal

¹ SecureNutrition works to bridge the operational knowledge gaps between nutrition and its underlying drivers. The project is managed by the World Bank Group and funded by the Russian Federation Ministry of Finance. www.securenutrition.org

² Increasing funding for nutrition: The role of advocacy and communication in Senegal. Interview with Abdoulaye Ka. *Nutrition Exchange* 7. www.enonline.net/nex/7/senegal

³ www.enonline.net/mediahub/increasingfundingfor-nutritiontheroleofadvocacyandcommunicationin-senegal

UNHCR multi-sector market assessment toolkit



The UN High Commissioner for Refugees (UNHCR) has launched a new guide, *Multi-sector Market Assessment: Companion Guide and Toolkit*, to assist humanitarian aid workers in undertaking market assessments for multiple sectors in line with UNHCR's basic needs approach¹. The guide and toolkit provide step-by-step guidance and ready-to-use tools for conducting market assessments and market monitoring and can be used in conjunction with *Operational Guidelines for Cash-Based Interventions in Displacement Set-*

*tings*², which considers market assessments as a vital pre-condition for the use of cash-based interventions.

The Companion Guide and Toolkit was initially piloted in Myanmar and Tanzania and will be used in Nigeria, in collaboration with the European Union (EU)-funded Enhanced Response Capacity (ERC) consortium working on multi-purpose cash grants and basic needs. The tool targets staff with basic technical knowledge of cash-based interventions and market data col-

lection and is applicable in all operational contexts. It can be adapted for use by all humanitarian partners, including United Nations agencies, non-governmental organisations, development actors and civil society.

The Companion Guide and Toolkit can be downloaded at <http://www.unhcr.org/593e856e7>

¹ www.refworld.org/docid/54d387d14.html

² www.unhcr.org/593e856e7

Public health in humanitarian crises online course

The Center for Humanitarian Health at John Hopkins University has launched a new online course on public health in humanitarian crises. It provides understanding of public health challenges that affect populations caught up in natural disasters and conflicts and explores how public health concepts and skills can be applied to mitigate their affects. The course is aimed at individuals interested in learning about public health in human-

itarian crises as well as seasoned humanitarian workers. Videos can also be downloaded and used as training materials. The course provides a mix of theoretical knowledge and practical examples from recent disasters, taught by instructors and guest lecturers with more than 200 years of combined experience in the field.

The course consists of ten modules, totalling around nine to ten hours of delivered content,

with an additional two to three hours of 'home' work. Discussion forums are also available. The course is free, although there is a charge of US\$49 for a certificate on satisfactory completion of the course. No training or previous experience is required.

Find out more at <http://hopkinshumanitarian-health.org/education/public-health-in-humanitarian-crises>

NO WASTED LIVES

Accelerating action for children with acute malnutrition

By Saul Guerrero, Nancy Aburto, Erin Body, Diane Holland, Guy Holloway, Abigail Perry and Sophie Whitney



Saul Guerrero is the Director of International Nutrition Initiatives at Action Against Hunger USA and interim Coordinator of the *No Wasted Lives* coalition. He previously worked for Valid International supporting the design, implementation and evaluation of community-based management of acute malnutrition (CMAM) interventions. In 2012 he co-created the Coverage Monitoring Network (CMN).



Nancy Aburto is the Chief of the nutrition-specific unit of the Nutrition Division of the World Food Programme (WFP) based in Rome, Italy. She has more than 15 years of experience in public health nutrition.



Erin Boyd is a Nutrition Advisor at USAID/OFDA. She has over ten years of experience in emergency nutrition response, covering policy, programme management, monitoring and evaluation, coordination and operational research.



Diane Holland is Senior Nutrition Advisor at UNICEF New York with a focus on scaling up programming to treat severe acute malnutrition and emergency nutrition. She previously worked in public health nutrition with non-governmental organisations (NGOs), UN agencies and in academia.



Guy Holloway is interim manager of the severe acute malnutrition portfolio at the Children's Investment Fund Foundation (CIFF) and has extensive experience in delivering child-centred health programmes across Sub-Saharan Africa and South Asia.



Abigail Perry is Senior Nutrition Adviser at DFID. She has extensive experience in development and emergency work and previously worked in a variety of technical roles for different NGOs and as a Research Associate at University College London.



Sophie Whitney is Global Nutrition Expert for the European Commission Directorate-General for European Civil Protection and Humanitarian Aid Operations (ECHO). She has extensive experience in nutrition, having worked for over 15 years in programme design, monitoring and implementation.

In *Field Exchange* 53 (November 2016) colleagues from Action Against Hunger, UNICEF, the Children's Investment Fund Foundation (CIFF), the Department for International Development (DFID), the European Commission and the United States Agency for International Development (USAID) made a collective case to scale up services to manage severe acute malnutrition (SAM) around the world. In that joint op-ed the authors recognised that *"to unlock the global and national challenges we will need to bring our different skills, knowledge, geographical reach and diverse networks to bear on this very pressing problem. Only if efforts are coordinated and dialogue sustained on the opportunities and challenges we face, will we maximise the influence and impact we can leverage, and bring others on board to drive change"*.

Since then other agencies, including the World Food Programme (WFP), the innocent foundation, the International Rescue Committee (IRC) and ALIMA, have come forward to answer this call and together we have created *No Wasted Lives*, a coalition to accelerate action for children with acute malnutrition.

The coalition aims to double the number of children receiving treatment for SAM to six million per year by 2020 as a critical step towards achieving universal coverage by 2030. Recognising that focusing on treatment alone will not result in the elimination of malnutrition (Sustainable Development Goal (SDG) target 2.2), the coalition also has a long-term vision of improving prevention options to reduce the number of children becoming acutely malnourished so that treatment

caseloads are manageable. Over the next few years, the coalition will work towards achieving a series of outcomes, including:

- The cost of curing a child suffering from SAM reduced to US\$100 or less (from the current US\$150-250);
- The cost of ready-to-use foods per child cured reduced by 50%;
- New treatment approaches proved capable of reaching over 70% of cases in areas of intervention (from the current 30-40%);
- Five key high-burden countries to adopt reduction and treatment coverage targets;
- Nutrition policies of all key bilateral donors to support scale-up of acute malnutrition programming, including treatment for SAM and prevention;
- All key high-burden countries to have national nutrition policies that promote prevention of and community-based treatment for SAM; and
- New financial pledges to be made that support actions to address acute malnutrition.

To achieve these ambitious aims and outcomes, the coalition will work on three key areas:

Advocacy agenda

The coalition will engage governments and other actors to support them in making the best decisions about prevention of and treatment for SAM. The coalition aims to facilitate the provision of evidence, intelligence and data that governments and other key actors need to make informed decisions. To this end, the coalition is currently developing a multi-year advocacy strategy supported by a US\$2.3 million grant from the CIFF.

Technical accelerator

The coalition will invest in cutting-edge ideas and bold hypotheses to drive forward global learning and action on prevention and treatment of acute malnutrition. To guide and support these efforts, the coalition has created an independent Council of Research and Technical Advice on Severe Acute Malnutrition (CORTASAM), which brings together over a dozen of the world's leading academics, practitioners and policy-makers in this area (see article in this edition of *Field Exchange*). The coalition has already invested over US\$8 million in operational research projects, including pilots on the integration of SAM treatment into the integrated community case management (iCCM) of childhood illnesses (Mali, Pakistan and Kenya); reduced dosage of ready-to-use therapeutic foods (RUTF) (MANGO project in Burkina Faso); simplified protocols for treatment of moderate acute malnutrition (MAM) and SAM (COMPAS project in Kenya and South Sudan, non-inferiority test in Burkina Faso); and setting up the new website The State of Severe Malnutrition (see www.severemalnutrition.org and feature in this edition of *Field Exchange*). The coalition is also supporting the ongoing prioritisation of research questions on acute malnutrition, using evidence gaps and opportunities for improving coverage as a primary step in the creation of a global

research agenda on acute malnutrition (see article for headline findings).

Donor forum

The coalition will convene and host a forum for traditional and non-traditional donors and governments with a view to increasing the overall amount of money available, improving coordination of existing investments, unlocking new health and long-term funding and bringing new donors and businesses to the table. This will include health/development departments of donors with prior history of supporting SAM treatment through their nutrition/humanitarian departments as well as foundations, bilateral and multilateral agencies and individual donors with no history of investing in this area. The forum will help donors align their messaging, approaches and priorities to ensure coherence. By facilitating information exchange, the coalition will encourage better integration of funding for SAM into global and domestic health budgets and will give donors, governments and service providers the best chance of driving down costs and maximising economies of scale.

Over the coming months the coalition will work with UNICEF and its national partners in the development of regional scale-up plans for SAM management services as part of, and to complement, nutrition costing plans currently being developed in many of these countries. The

UNICEF-organised multi-stakeholder meetings in East Africa (16-18 May), South Asia (18-20 May)¹ and West Africa (19-21 June) provided the basis for these regional plans by identifying key challenges and opportunities for scaling up services across a range of contexts. The meetings brought together UNICEF country and regional office representatives and ministry of health delegates from virtually all countries in these regions.

No Wasted Lives will continue to build on existing efforts, create and maximise synergies and bring new players on board to accelerate progress and overcome the programmatic, technical, policy and financing challenges to addressing the global burden of acute malnutrition. We have convened a coalition of partners to begin this journey but we cannot do this alone: the success or failure of this initiative will rest on our ability to engage and mobilise governments, civil society, business and other stakeholders to push this ambitious agenda.

If you or your organisation would like to know more and to explore ways to support and collaborate with *No Wasted Lives*, visit our website (www.nowastedlives.org) or reach out to us on info@nowastedlives.org.

¹ See Stunting & Wasting in South Asia – Reflections from a Regional conference by Charulatha Banerjee, ENN Regional Knowledge Management Specialist (SUN Movement) in the region. www.ennonline.net/mediahub/wastinginsouthasia

DRIVING EVIDENCE TO ACTION: The Council of Research & Technical Advice on SAM (CORTASAM)

By Amy Mayberry, Saul Guerrero, Mark Manary and Noel Marie Zagre



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Dr Mark Manary is Associate Professor of Paediatrics at Washington University School of Medicine and Lecturer at Malawi School of Medicine in Blantyre, Malawi. He has been involved in nutrition and metabolism research in Malawi for the past two decades and served as principal investigator for the ready-to-use therapeutic food (RUTF) studies there. He is current Co-Chair of CORTASAM.



Saul Guerrero is Director of International Nutrition Initiatives at Action Against Hunger USA and interim Coordinator of the *No Wasted Lives* coalition. He previously worked for Valid International, supporting the design, implementation and evaluation of community-based management of acute malnutrition (CMAM) interventions. In 2012 he co-created the Coverage Monitoring Network (CMN).



Dr Noel Marie Zagre is Regional Nutrition Advisor for UNICEF in the West and Central Regional Office (WCARO), based in Dakar, Senegal. He has worked with UNICEF across Sub-Saharan Africa, East Asia, the Pacific and South Asia for the past 12 years and previously held senior roles at Helen Keller International and the National Health Sciences Research Institute in Burkina Faso. He is current Co-Chair of CORTASAM.

An estimated 52 million children under five years of age suffered from acute malnutrition, of which 16.9 million suffered from severe acute malnutrition (SAM) in 2016 (UNICEF, WHO and World Bank, 2016). Treatment for acute malnutrition, which puts the lives of millions of children at risk each year, is effective and significant advances have been made in the past decade to improve the quality and coverage of programmes. More children are being successfully treated for SAM than ever before, yet less than

20% of children with SAM currently receive the treatment they need (UNICEF, 2015).

As part of the global efforts to address these gaps and improve the prevention and treatment of acute malnutrition, the *No Wasted Lives* coalition was formed with the aim of doubling the number of children receiving treatment to six million per year by 2020. This is a critical step towards achieving universal coverage of all SAM children by 2030, while concurrently working towards improved prevention measures and reducing the number of children who fall into

acute malnutrition. One of the biggest challenges to achieving this scale-up of treatment is evidence, both in terms of generating new evidence and using existing evidence effectively to improve programmes and policies. Despite advances made to date, significant gaps remain in the existing evidence base to support the successful and meaningful scale-up that will achieve these ambitious goals.

To address the gaps, the *No Wasted Lives* coalition founded the Council of Research & Technical Advice on SAM (CORTASAM) in

2016. Comprised of leading experts in child health and nutrition across the world and representatives of regions with the highest burden, the Council's goal is to drive the use of evidence for action in order ultimately to reach more children with effective treatment and prevention programmes. The Council aims to do this in three ways:

1. Set research priorities: Identify research and knowledge gaps to guide global research priorities in the prevention and treatment of acute malnutrition;
2. Drive the use of evidence in programmes: Provide a systematic and transparent review of the emerging evidence, resulting in interim advice on the operational implications and application; and
3. Drive the use of evidence in policies: Coordinate with the World Health Organization (WHO) to ensure critical evidence gaps are filled and result in integration of emerging evidence into normative guidance.

A critical first step for CORTASAM was to identify key research priorities across acute malnutrition.

By taking a comprehensive review of the research questions across the sector and then prioritising, we can better support the process of filling critical gaps in the evidence and improve coordination and action to scale up evidence-based prevention and treatment programmes. The research prioritisation exercise recently led by CORTASAM is presented in this edition of *Field Exchange*. The exercise used a well-established methodology developed by the Child Health and Nutrition Research Initiative (CHNRI), a systematic and transparent approach that has produced a set of research priorities and, we hope, a critical strategic steer and leadership in this area.

Looking ahead, the aim of CORTASAM is to expand on these priority areas and develop clear action plans to progress them between now and 2020. To do this we will need to use reviews of the available evidence, a mapping of ongoing research that will produce new evidence in these areas (already underway; see below) and global and regional consultations to identify

the critical gaps that need addressing to drive the use of evidence for action. Our commitment is to continue our work to advocate for and use the research and evidence needed to truly make an impact. But we cannot do this alone. *No Wasted Lives* and the work of CORTASAM are a platform to guide and coordinate global efforts and we rely on the experts, researchers, and implementers like you to help us achieve this goal.

More information and updates on the work of CORTASAM and *No Wasted Lives* can be found at www.nowastedlives.org

An initial mapping of ongoing research across the research areas and priorities is now available on The State of Severe Malnutrition website; see: www.severemalnutrition.org/en/content/ongoing-research

References

UNICEF, WHO and World Bank. Joint child malnutrition estimates – levels and trends (2016).

UNICEF (2015). UNICEF Annual Results Paper.

PRIORITISING ACUTE MALNUTRITION RESEARCH: preliminary results of a CHNRI survey

By Amy Mayberry and CORTASAM members



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where she supports the technical and research activities of *No Wasted Lives*, including CORTASAM. She previously worked in the Evidence, Measurement & Evaluation Team at the Children's Investment Fund Foundation (CIFF).

Members of the Council of Research & Technical Advice on SAM (CORTASAM) are: Nancy Aburto, Tahmeed Ahmed, Paluku Bahwere, Robert Black, André Briend, Elhadj Issakha Diop, Steve Jarrett, Marko Kerac, Ferew Lemma, Mark Manary, Marie McGrath, Susan Shepherd, Zita Weise Prinzo and Nöel Marie Zagre.

These are preliminary findings. The final findings are currently being prepared for publication in a peer-reviewed journal.

Background

As you will have read in the preceding articles in this issue of *Field Exchange* on *No Wasted Lives* and the Coalition of Research & Technical Advice on Severe Acute Malnutrition (SAM) (CORTASAM), our ambitions are large. A critical pillar of this effort to accelerate global action is driven by the generation and use of evidence. CORTASAM was founded to help fill gaps in the existing evidence base to support scale-up of effective programmes and drive the use of evidence for action. At the outset, it became evident that a set of research priorities would provide a fundamental platform to guide the work of the Council, as well as other researchers, implementers, policy-makers and donors. Where time, capacity and financial resources are limited, research priorities can focus efforts on the critical areas that will ultimately translate into meaningful action across programmes and policies. However, to be truly useful these research priorities need to reflect the opinions of the experts, the researchers and the implementers, like you, who are working every day to advance this field.

The scope of this exercise focused on research priorities related primarily to treatment across the continuum of acute malnutrition in children under five years of age. Given the state of evidence and other technical groups working on prevention, this exercise only included prevention where it was linked with treatment. The aim was to produce a set of research priorities that are critical to achieve measurable improvements in the quality, effectiveness, scale and sustainability of programmes addressing acute malnutrition in children under five years of age that will ultimately result in scaling up treatment by 2020.

Methods

To achieve this, CORTASAM led an exercise using the Child Health & Nutrition Research Initiative (CHNRI) methodology (Rudan et al, 2008) for setting research priorities. This exercise provides a robust and transparent framework to collect global, regional and country-level stakeholder feedback by scoring a set of research questions against a set of pre-defined criteria.

A long list of research questions was identified by collating published research questions and priorities from across the sector, including those previously identified by the World Health Organization (WHO), other technical interest groups and in a consultation with CORTASAM and additional regional stakeholders. This list of hundreds of questions reflects the breadth and depth of research areas and opportunities to support improvements and scale-up of cost-effective programmes for acute malnutrition, including new and innovative areas that are emerging.

The long list of research questions was grouped into 53 research areas which, while focused, would likely not be answerable by a single research study but could be collectively answered by a group of inter-related research studies.

An online survey was made available from 3 April to 5 May 2017. While CORTASAM members were invited to participate, the survey was also shared with global and regional staff in the *No Wasted Lives* coalition and with other researchers, implementers, academics and donors working in the sector.

The survey collected basic information on country/region of work, organisation and type of work for all re-

spondents. The bulk of the survey focused on the research prioritisation, where each research area was scored against each of the following criteria:

- **Impact:** Would the research lead to interventions and solutions that provide the maximum potential impact (e.g. on global burden of acute malnutrition or mortality due to malnutrition) by 2020?
- **Effectiveness:** Would the research lead to interventions and solutions that are effective (e.g. under routine programme conditions) and deliverable (e.g. taking into account the health system infrastructure, human resources, safety)?
- **Answerability:** Is it possible to answer the question (is it feasible to implement within the given context and timeframe (by 2020)? Is it ethical?)
- **Sustainability:** Would the research lead to interventions and solutions that are sustainable (e.g. considering cost and financial affordability, cost-effectiveness, favourable political climate)?

Each of the 53 research areas received four scores (one per criteria) between 0 and 1. These were averaged to produce a single research priority score (RPS) that was used to produce the analyses. A global ranking analysis was done using all responses. In addition, regional analyses for West and Central Africa, East Africa and South Asia were undertaken using only responses from those regions.

Findings

A total of 313 unique responses were received; 143 (46%) of these were fully completed. These responses represented 63 different countries and 167 different organisations globally (see Figure 1). Nearly half of respondents (46.7%) identified their work as being primarily operational or programmatic; others reported to be working in academia (15%), government (11%), policy (2.2%), or in another type of work (23%). A full list of countries and organisations represented can be found at <http://www.nowastedlives.org>

Figure 1 Breakdown of respondents

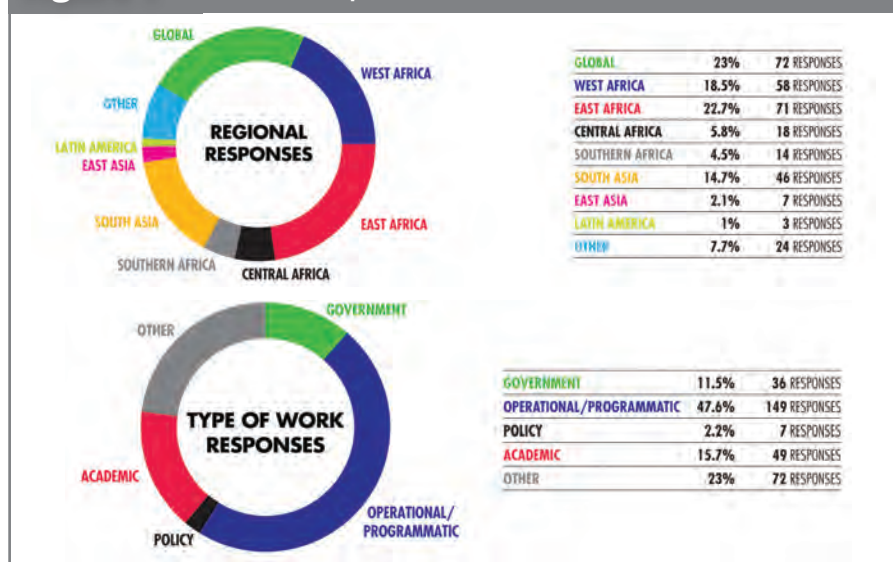


Table 1 Top five global research questions and their regional prioritisation

Global rank	Research area	West & Central Africa	East Africa	South Asia
1	What are the most effective tools to diagnose acute malnutrition in children 6-59 months of age by community members, including community health workers and caretakers?	X		X
2	What are effective therapeutic feeding approaches for the management of severe acute malnutrition in children 6-59 months of age with diarrhoea?	X		
3	What are effective and safe strategies and protocols to support the scale-up of treatment of acute malnutrition in infants <6 months of age?		X	
4	What are the causal factors of relapse after treatment of acute malnutrition in children 6-59 months of age and how can they be minimised?*			
5	What is the relationship between the nutrition and health status of mothers and acute malnutrition in their children and how can interventions within the 1,000-day window reduce the risk of acute malnutrition?	X	X	X

*This question ranked number 8 in West and Central Africa, 11 in East Africa and 13 in South Asia

LAUNCH OF THE STATE OF SEVERE MALNUTRITION WEBSITE

A new website, the State of Severe Malnutrition, has been launched by the *No Wasted Lives* Initiative (www.nowastedlives.org), providing a comprehensive overview of all qualitative and quantitative resources on acute malnutrition. The website aims to link malnutrition discussions to wider public health and child survival debates, highlight the progress that has been made globally on treatment coverage, and provide a global perspective and country-specific overviews of malnutrition treatment outcomes. It also provides a platform to support coordination and communication across key research areas, amongst researchers and those interested in using emerging evidence for programmes and policies.

The site brings together information from a range of sources, providing the most up-to-date information on acute malnutrition. Sources include UNICEF's 'Global SAM Management Up-

date Tool (Nutridash)' data, Coverage Monitoring Network, The CMAM Forum, WHO/UNICEF/World Bank Joint Estimates, Global Nutrition Report, WHO mortality database, WHO Malaria database, UNAIDS HIV database as well as Centre for Disease Control (CDC) databases. The website also links with WHO's Global Database on the Implementation of Nutrition Actions (GINA) and ENNs periodic publications (Field Exchange and Nutrition Exchange). Technical questions are directed to en-net, the established online forum hosted by ENN.

Content is shared in a user-friendly format, using interactive maps and visuals. Resources, events and 'state of play' at country level are organised by the following themes:

- **Enabling environment:** includes policy and guidance documents, as well as financing data points and information.

- **Supply:** includes data on products and routine medicine, human resources, geographical coverage and community mobilisation.
- **Demand:** includes quantitative data on the burden of acute malnutrition, nutrition and infection (including malaria and HIV) and health-seeking behaviour.
- **Quality:** includes data on treatment admission and exits, treatment coverage, lives-saved estimates and cost-effectiveness.

Ongoing research is shared through an interactive diagram that maps current ongoing research related to severe malnutrition (www.severemalnutrition.org/en/content/ongoing-research). The studies and information included draw from publicly available research protocols and research databases as well as additional information submitted by the research teams involved. Information is provided at thematic, sub-theme and individual study level.

Individuals are invited to join the discussions on data or submit resources, research and events as part of the website's ongoing development.

To find out more, visit www.severemalnutrition.org or contact: info@severemalnutrition.org

Counselling at the IYCF 1000 day room, Gambella, Ethiopia, 2017

Management of acute malnutrition in infants less than six months in a South Sudanese refugee population in Ethiopia

By Mary T Murphy, Kassahun Abebe, Sinead O'Mahony, Hatty Barthorp & Chris Andert



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GOAL would like to acknowledge the ongoing support of ARRA, UNHCR and UNICEF. GOAL would also like to thank the MAMI Special Interest Working Group for their work on the CMAMI tool.

Location: Ethiopia

What we know: The World Health Organization (WHO) recommends that infants under six months old (U6m) with uncomplicated severe acute malnutrition (SAM) are treated in the community.

What this article adds: In 2015, GOAL integrated community-based management of acute malnutrition in infants U6m (C-MAMI) into primary healthcare services in two refugee camps in Gambella Region, Ethiopia. Existing mother-to-mother support groups (M2M) incorporated preventative and screening activities. Weekly contact points in blanket supplementary feeding programmes were leveraged to provide targeted individual counselling in a dedicated room to cases identified. Between January 2016 and January 2017, 3,436 infants U6m were screened and 259 SAM cases were successfully treated. C-MAMI is a feasible intervention in a resource-limited setting. The C-MAMI tool is effective but could be streamlined and made more user-friendly. The absence of a mid-upper arm circumference (MUAC)-based case definition for infants U6m creates screening challenges. Increased acute malnutrition prevalence at four and five months of age was observed, likely contributing to child burden of acute malnutrition. Development of programming tools, greater data collection and a more formal evaluation is planned.

Introduction

Malnutrition is a major cause of death in children under five years old (U5). An estimated 45% (3.1 million) of annual child deaths can be attributed directly to, or have an underlying cause of, malnutrition (Black et al, 2013). The United Nations (UN) estimates that severe acute malnutrition (SAM) alone kills at least one million children U5 every year (WFP et al, 2007). A 2011 review estimated that 23% (3.8 million) of the overall SAM burden occurs in the under-six months-old age group (infants U6m) and a further 4.7 million infants U6m suffer from moderate acute malnutrition (MAM) (Kerac et al, 2011)¹. A secondary data analysis of the admission profile and outcomes among infants U6m admitted to inpatient programmes for treatment found a greater risk of death during treatment in this age group (Grijalva-Eternod, 2017).

For decades this age group was considered less vulnerable to malnutrition due to the assumption that exclusive breastfeeding (EBF) protects against early malnutrition until approximately six months

of age. However, global prevalence of EBF is only 36% in the U6m age group; therefore millions of infants are exposed to risky feeding practices (such as contaminated water, prelacteal feeds and early introduction of inappropriate foods) that can cause diarrhoea, growth retardation and acute malnutrition (WHO, 2015). This blind spot means that infants U6m are often overlooked in community screenings for malnutrition, standard nutrition surveys (Lopriore et al, 2007) and treatment programmes. Challenges in their assessment and management also dissuade programmers from including them in surveys and interventions. The challenges include difficulties in measuring weight-for-length (WLZ) (length measurement requires greater skill and WLZ references not available for <45cm); absence of a community-screening tool such as mid-upper arm circumference (MUAC) for this age group (standard cut-offs are not established); and a lack of well-defined interventions.

¹ Estimates are based on a global SAM burden of 16.5 million children under five years old; more recent estimates

Box 1 GOAL's nutrition programme activities

- Mass screening using MUAC every trimester.
- Systematic screening using MUAC and WHZ once per month prior to blanket supplementary feeding (BSF).
- Weekly blanket supplementary feeding programmes (BSFP) as mandated by UNHCR and ARRA for children 6-59m without acute malnutrition.
- Targeted supplementary feeding programmes (TSFP) for children 6-59m with MAM.
- Outpatient therapeutic programmes (OTP) for children 6-59m with non-complicated SAM.
- Stabilisation centres (SC) for children 0-59m with complicated acute malnutrition.
- Infant and young child feeding (IYCF) and maternal nutrition counselling for all families with children under two years of age and/or pregnant-lactating women (PLW).
- C-MAMI for infants 0-6m.
- Mother-to-mother groups (M2M).
- Community-based counselling and support for PLW and their husbands.
- Micro-gardening to promote dietary diversity.
- Various survey and assessment activities.

Table 1 Profile of interventions for infants U6m pre- and post- introduction of C-MAMI tool

Interventions targeting infants U6m pre-2015 introduction of C-MAMI	Interventions added or changed targeting infants U6m post introduction of C-MAMI
<ul style="list-style-type: none"> • Advocacy for inclusion of infants U6m into camp nutrition policy. • Mother-to-mother support groups (M2M). • Clinical assessment and individual counselling without standardised guideline. • Increased identification of malnourished cases in the community and referral for treatment. 	<ul style="list-style-type: none"> • Database monitoring acute malnutrition rates in infants U6m in Terkidi and Kule camps established and updated monthly. • Clinical assessment and individual counselling using standardised guideline in the form of the CMAMI tool.

In 2013, the World Health Organization (WHO) released updated guidance for the management of SAM; for the first time, this recommended outpatient care for uncomplicated SAM in infants U6m. Following this, the management of acute malnutrition in infants (MAMI) Special Interest Group² developed the community-based management of acute malnutrition in infants (C-MAMI) tool, a decision tool for programmers to support the delivery of WHO recommendations. C-MAMI has a similar structure to integrated management of childhood illness (IMCI) decision tools and was developed as a starting point for programmers to build on. These two developments substantially contributed to the much-needed recognition that infants U6m are vulnerable to acute malnutrition and that a community-based model for their identification and care is needed.

Overview of GOAL's refugee nutrition programme in Gambella, Ethiopia

In 2014, in response to the large influx of refugees from South Sudan, GOAL, in collaboration with UNHCR and ARRA³, began implementing nutrition programmes as the lead agency in two newly established refugee camps in the Gambella Region of Ethiopia: Tierkadi camp (total population of 70,334) and Kule camp (total population of 52,515) (UNHCR and ARRA, 2017). GOAL's nutrition intervention was based on the Gambella Nutrition Harmonisation Guidance Note (UNHCR and ARRA, 2014), summarised in Box 1.

While establishing the nutrition programme in 2014, GOAL noted high numbers of infants in the camps and observed suspected cases of malnutrition in infants attending weekly BSFP distributions with their mothers. In response, and in the light of the 2013 updated WHO SAM guidance, GOAL Ethiopia broadened its nutrition approach to include extremely vulnerable infants U6m (the MAMI group) for malnutrition prevention, identification and management.

Nested management of acute malnutrition in infants (MAMI) component

Over a period of three years, a series of interventions was introduced into GOAL's nutrition

programme across the two refugee camps to address the needs of infants U6m. Initially, GOAL focused on identification using WLZ screening and provision of counselling through M2M, baby-friendly spaces and counselling at BSFP distributions. In 2015, C-MAMI was integrated into the primary healthcare services across the two camps to provide more systematic outpatient counselling and fill the gap in clinical care for outpatient MAMI management (see summary in Table 1).

Preventative actions

To undertake integrated MAMI activities, GOAL first leveraged contact time at weekly BSFPs, beginning in 2015. Here, IYCF counselling is delivered to all pregnant women and mothers of children under two years old, irrespective of their nutritional status and prior to the receipt of any rations, in the 'baby-friendly spaces/1,000 days of life room' (a large room situated close to a BSFP distribution point). Support includes open discussions held in a group setting, individual counselling and, where possible, women are linked to M2M groups close to their homestead. Infants U6m are evaluated weekly (including visual assessment, vaccination card check, referral for expanded programme of immunisation (EPI) if needed, breastfeeding support and checks on the wellbeing of mother and baby) and their anthropometric information is recorded monthly. If any problems are detected or issues with breastfeeding arise, the baby is screened more frequently.

M2M discussion groups are used in the camp community to convey positive messages and practices for the mother-child dyad. M2M groups help identify problem cases and refer them to the centre for support. GOAL has applied to conduct MUAC screening by mothers in the second half of 2017 in around 5,000 households. The camps are divided into zones, then sub-divided into blocks; there is at least one M2M group per block led by a trained lead-mother volunteer, hosting participants from around 10 to 20 neighbouring families. Refresher training is provided to lead mothers every three months. Refresher trainings are also provided to all GOAL recruits, many of whom are camp residents themselves, every six months.

Both the BSFP and M2M forums provide an opportunity for women and the GOAL IYCF counsellors to meet each other and form a relationship.

Identification and referral

Two types of screening and referral activities are conducted, as follows:

1. Systematic screening

1a. Systematic screening of the 6-59 months age group

This comprises a two-stage screening exercise to identify children considered at risk of acute malnutrition (defined by a MUAC of <13.5cm) and for those identified as 'at risk' to confirm their nutritional status using weight-for-height z-score (WHZ) / WLZ and MUAC. Those found to be suffering from acute malnutrition are defined by WHZ/WLZ <-2SD, MUAC <12.5cm and/or bilateral pitting oedema.

There are two systematic screening points in the first screening stage: a) through ongoing, community-based, active case-finding by community health workers (CHWs); and b) prior to a BSFP distribution for all children attending (although the BSFP functions on a weekly basis, systematic screening occurs every four weeks).

Children aged 6-59 months identified with MUAC <13.5cm are referred to the second stage of screening, which involves reassessment at facility level, including WHZ or WLZ, and admission to the appropriate programme based on anthropometric or clinical criteria, as outlined in Table 2.

Children identified with MAM (MUAC <12.5cm and >-11.5cm) are referred to TSFP; children identified with SAM (MUAC <11.5 and/or WHZ <-3 and/or bilateral pitting oedema + / ++) are referred to OTP.

1b. Systematic screening of U6m group

This comprises a two-stage, monthly screening exercise at a baby-friendly spaces/1,000 days of life room in conjunction with screening of all young children under two years of age prior to

² <http://www.enonline.net/ourwork/research/mami>

³ A government agency, the Administration for Refugee and Returnee Affairs (ARRA) and United Nations High Commissioner for refugees.

Table 2 Admission criteria for infants and children for different service streams, including the C-MAMI component

Children 6-59 months		Infants 0-6 months	
Programme	Admission criteria	Programme	Admission criteria
BSFP for MAM prevention	All non-malnourished children 6-59m NB: Service is also provided to PLW and chronic medical cases	IYCF & maternal nutrition counselling for maternal nutrition prevention	All carers of infants 0-6m and older children (6m-2yrs) receive IYCF counselling prior to BSFP ration distributions
TSFP for MAM cases	MUAC <12.5cm & >11.5cm &/or WHZ >-3 & <-2 &/or (without complication and with appetite)	C-MAMI outpatient for uncomplicated MAM and SAM cases. ⁵	MUAC <11cm in infants 2-6m (GOAL own criteria) &/or WLZ <-2 &/or Recent weight loss, failure to gain weight or visible wasting (without complications)
OTP for uncomplicated SAM cases	MUAC <-11.5 &/or WHZ <-3 &/or bilateral pitting oedema + / ++ (without complications and with appetite)		
SC for complicated SAM cases	MUAC <-11.5 &/or WHZ <-3 &/or bilateral pitting oedema + / ++ / +++ (AND with complications or anorexia)	Inpatient care for complicated SAM cases	MUAC <11cm in infants 2-6m GOAL own newly incorporated criteria) &/or WLZ <-3 (with complications; i.e. too weak to suckle effectively, BF failure, static weight or recent loss) Or bilateral pitting oedema + / ++ / +++

BSFP distribution. To identify infants aged 2-6 months at risk of acute malnutrition, a MUAC < 11cm is used. Additional criteria applied to the 0-2 months age group include bilateral pitting oedema, visible thinness, reported recent weight loss and/or reported feeding problems.

In this first systematic screening stage infants are assessed by a clinical worker. Infants considered at risk of malnutrition are then referred to the second stage of screening, which involves reassessment using WLZ and admission to the appropriate programme based on anthropometric or clinical criteria (as outlined in Table 2).

2. Mass screening

A mass-screening exercise is conducted roughly every three months for children aged 6-59 months using MUAC and checking for bilateral pitting oedema. Children measuring <12.5cm and >11.5cm are referred directly to the TSFP. Those measuring <11.5cm and/or with bilateral pitting oedema are referred to the OTP (complicated cases are referred to the SC). All non-acutely malnourished children aged 6-59 months are referred to the BSFP. The GOAL team has not yet started to include mass MUAC screening for infants during this activity as, from experience, this group are fully captured in the systematic screening described above and sufficiently catered for. The purpose of mass screenings is firstly to try to identify any cases of acute malnutrition that did not present with their mother at the BSFP or who were not identified through CHW active case-finding. Secondly, it gives camp managers an idea of the population of young children in the camp eligible for BSFP or TSFP. These different points of contact have allowed GOAL to identify a high proportion of acutely malnourished infants for referral to appropriate services.

C-MAMI intervention

When an infant U6m is identified as acutely malnourished, he/she is referred to the outpatient department for assessment. Those with acute malnutrition and complications are referred to the SC for medical intervention and therapeutic feeding. Those with acute malnutrition without

complications are referred to the C-MAMI programme. Here counselling is provided by a female nurse, who troubleshoots breastfeeding issues with the mother and infant and provides individual counselling in line with the C-MAMI guidelines. The infant may be required to present daily if more intensive support is required to help rehabilitate the child and support the mother, or may be followed up on a weekly basis prior to BSFP distributions.

More intensive daily support takes place in a corner of the baby-friendly spaces/1,000 days of life room. Mothers receive food and breastfeeding support. If an infant requires a breastmilk substitute, the caregiver is taught how to prepare infant formula and how to feed using cup and spoon (bottles are never used)⁴. Where infant formula use is indicated, mothers are provided with on-site milk feeds and given milk supply for afternoon and overnight feeds at home.

On average, two infants attend daily at each of the four sites. The caregiver remains with the infant at all times. If limited progress is being made, such as continued issues with feeding, limited weight gain or illness, the infant is referred to the SC for more detailed investigation and, if appropriate, intensive intervention. If the infant reaches six months of age and is still malnourished, they are referred to the OTP or TSFP as appropriate. If their malnutrition has resolved they are discharged to BSFP, where the mother receives food support.

C-MAMI staff are female nurses and counsellors who speak Nuer, the language of the refugees. Staff receive formal training on IYCF and C-MAMI guidelines. There are also weekly on-the-job training and discussions facilitated by the programme manager, with case study reviews of individual cases.

Community outreach activities include active case-finding, referral, follow-up of CMAM absentees/non-responders (default rate for infants U6m is extremely low at close to 0%), sensitisation around the different services available, nutrition counselling and support for PLW and their hus-

bands to highlight the additional nutritional requirements during pregnancy and breastfeeding.

GOAL also supports the construction and maintenance of buildings and structures to support the delivery of facility-based activities. Micro-gardening is promoted in a selection of homesteads with beneficiaries registered in the CMAM programme to encourage improved dietary diversification. Annual nutrition SMART surveys are conducted in collaboration with UNHCR and partners.

Success and challenges with integrated MAMI programming

Between January 2016 and January 2017, GOAL screened 3,436 infants U6m across the two refugee camps, taking weight, length and MUAC measures at contact points described above. This identified 259 acutely malnourished infants who were treated and cured in the C-MAMI programme (see Table 3 for age profile of admissions). Progress data, such as rates of weight gain, are not currently measured; there are plans to develop and implement individual record cards to capture this in the future. Some infants whose mothers died in childbirth or who are ill needed to stay for a longer period of up to six months. Any other type of 'non-responder' does not usually occur; if the infant is having another problem related to breastfeeding there is an intervention (referral to the SC or use of artificial milk according to strict protocols).

As a result of the MAMI programme, there is increased awareness of acute malnutrition in infants in the camp by both staff and residents. The intervention has identified infant feeding trends previously not well understood, such as higher rates of acute malnutrition amongst infants at four and five months of age. This enables better design and targeting of counselling

⁴ As stipulated by the UNHCR SOP on BMS (UNHCR, 2015) and C-MAMI tool (IFE Core Group, 2015)

⁵ C-MAMI Tool, Version 1.0, November 2015 Community management of uncomplicated acute malnutrition in infants < 6 months of age (C-MAMI)

Table 3 Admission to C-MAMI by age in months

Age in months	# malnourished	Total # screened
1	33	595
2	48	813
3	45	720
4	62	653
5	71	655
Totals	259	3436

to address specific contributing issues. A nutrition causal analysis is planned in the camp in the coming months to investigate this further; one hypothesis is that early introduction of comple

The integration of acute malnutrition services for infants U6m into GOAL's wider CMAM programme took time. As there is no simple screening tool (such as MUAC) for infants U6m, it was difficult in the initial phase for staff to recognise the scale of the problem and therefore want to invest precious time in supporting this age group. However, over the past three years, numbers of infants screened and identified have slowly increased due to continued staff capacity-building and advocacy by GOAL staff for the inclusion of this group in the camp nutrition strategy.

Providing effective C-MAMI support when the mother has passed away is always problematic (these data are not currently captured). If a female caregiver is available, GOAL promotes wet nursing. Where no wet nurse is available, GOAL follows an agreed standard operating procedure for breast-milk substitutes for Gambella and the infant must attend the IYCF C-MAMI corner daily for cup and spoon-feeding.

Additional workload for nursing staff to implement the C-MAMI protocol is a challenge. The C-MAMI guideline is lengthy, taking 20-40 minutes per individual; nursing staff have this additional responsibility but no additional resources. There is a lack of trained female nurses who speak the Nuer language and the remoteness and harsh nature of camp locations make it difficult to recruit staff.

Lessons learned and next steps

GOAL is in the early stages of addressing MAMI needs among refugees in Ethiopia. Despite a shortage of funds to apply MAMI activities, over the past three years GOAL has used resources wisely to integrate MAMI into existing nutrition programming. Early lessons learned include:

The C-MAMI protocol is time-consuming but effective!

The first version of the C-MAMI tool has proven effective in Gambella, Ethiopia. The tool has supported clinicians to provide systematic counselling for mothers with malnourished infants. However, the tool is lengthy and creates an additional workload for nursing staff in an area where recruitment of nurses is difficult. Based on GOAL's experience, we believe there is scope for further refinement of the C-MAMI tool to improve its efficiency and user-friendliness.

Absence of community case definition for U6m age group makes identification challenging

The absence of a case definition for MUAC screening of infants U6m means that these infants are not included in mass screening exercises. Full growth-monitoring, including age, gender, weight and length, is currently required. This is labour-intensive and time-consuming in limited resource and literacy settings. The absence of a MUAC cut-off for this group also means it is regularly excluded from nutrition surveys, as an additional sample size would be needed to calculate GAM and SAM rates accurately. There is, however, scope for developing a nutrition survey sample-size calculation application which accounts for the inclusion of infants U6m, while allowing for representative MUAC and WHZ score malnutrition prevalence to be calculated.

There is potential for C-MAMI to reduce the number of infants entering CMAM at age six months

Although not yet empirically measured, we observe that the early identification of acute malnutrition in infants U6m will reduce the number of SAM cases with complications presenting at six months, once MUAC screening is applied. GOAL's data in Gambella reveal a trend in increasing GAM and SAM rates at four and five months of age. If these infants are not identified until six months old, when conventional MUAC screening can be applied, it is likely they will have significantly deteriorated. Considering this, GOAL has been using MUAC <11cm in infants aged 2-6 months as an additional means of trying to identify wasting. This is an area GOAL will continue to investigate further in 2017.

GOAL's experience has been that, where a comprehensive nutrition programme is already in existence, it is entirely feasible to include C-MAMI activities, with limited resources (both personnel and monetary), allowing for the identification and management of non-complicated malnutrition in infants U6m, challenges notwithstanding. In Gambella, leveraging existing contact points has been key.

Recommendations for C-MAMI programming and next steps

Based on the lessons learned, we believe the following steps are required to move towards improved integration and scale-up of C-MAMI services:

1. A simpler, more concise C-MAMI protocol to allow for quick triage and more efficient counselling of infants U6m with uncomplicated SAM.
2. Development of C-MAMI monitoring tools such as admission cards and reporting templates.
3. The broadening of nutrition programming to include 0-59 months as the target group for survey, assessment and curative nutrition (currently this age group is only considered for IYCF and the '1,000-days' approach).
4. A simple case definition for identification

of infants with acute malnutrition in a community setting, as exhaustive weight for length screening is not feasible in low-resource and low-literacy settings.

GOAL will continue to advocate for and support the inclusion of infants in the management of acute malnutrition programming by consciously broadening target groups from 6-59 months to 0-59 months in nutrition programme strategies, proposals, implementation plans and evaluations. The provision of C-MAMI support in refugee contexts in Ethiopia will continue, alongside investigations into trends, such as the higher rates of acute malnutrition in infants aged four to five months. GOAL is trialling newly designed C-MAMI admission cards and plans to develop a programme monitoring toolkit to support a seamless transition from C-MAMI to CMAM. GOAL is also hoping to undertake a more formal evaluation of the C-MAMI tool implementation in collaboration with Save the Children and others to inform a second version of the C-MAMI tool. At a global level, GOAL will continue to work with and contribute to the MAMI Special Interest Group and partner with academic institutions to conduct quantitative and qualitative research into barriers and boosters to C-MAMI service provision and uptake.

⁶ London School of Hygiene and Tropical Medicine (LSHTM), the Kenya Medical Research Institute (KEMRI)/Wellcome Trust Research Programme, Emergency Nutrition Network (ENN) and the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr).

References

- Black R et al (2013). *Maternal and Child Undernutrition and Overweight in Low-Income and Middle-Income Countries*. The Lancet. 382 (9890): 427-451.
- Grijalva-Eternod CS, Kerac M, McGrath M, Wilkinson C, Hirsch JC, Delchevalerie P, Seal AJ. *Admission profile and discharge outcomes for infants aged less than 6 months admitted to inpatient therapeutic care in 10 countries. A secondary data analysis*. Matern Child Nutr. 2017 Jul 25. doi: 10.1111/mcn.12345. [Epub ahead of print]
- IFE Core Group (2015) *Community management of uncomplicated acute malnutrition in infants < 6 months of age (C-MAMI)*. <http://files.enonline.net/attachments/2435/C-MAMI-Tool-Web-FINAL-Nov-2015.pdf>
- Kerac M, Blencowe H, Grijalva-Eternod C, McGrath M, Shoham J, Cole, TJ and Seal A. (2011) *Prevalence of wasting among under 6-month-old infants in developing countries and implications of new case definitions using WHO growth standards: a secondary data analysis*. Arch Dis Child 2011;96:1008-1013.
- Lopriore C, Dop MC, Solal-Celigny A and Lagnado G. *Excluding infants under 6 months of age from surveys: impact on prevalence of pre-school undernutrition*; Public Health Nutr. 2007 Jan;10(1):79-87.
- UNHCR and ARRA (2014) *Ethiopia Refugee Programme Nutrition Harmonization Guidance Note: Gambella*. Jan 2014 UNHCR/ARRA.
- UNHCR (2015) *Infant and young child feeding practices Standard Operating Procedures for the Handling of Breastmilk Substitutes (BMS) in Refugee Situations for children 0-23 months*. www.unhcr.org/uk/publications/operations/55c474859/infant-young-child-feeding-practices-standard-operating-procedures-handling.html
- WFP, WHO, UNSCN, UNICEF (2007). *Joint Statement on Community-Based Management of Severe Acute Malnutrition*.
- WHO (2015). *World Health Statistics 2015*. World Health Organization. http://apps.who.int/iris/bitstream/10665/170250/1/9789240694439_eng.pdf?ua=1&ua=1

Scaling up CMAM in protracted emergencies and low resource settings: experiences from Sudan

By Tewoldeberhan Daniel, Tarig Mekkawi, Hanaa Garelnabi, Salwa Sorkti and Mueni Mutunga



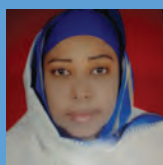
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Appetite test carried out in CMAM programme, North Darfur, Sudan, 2016

Location: Sudan

What we know: Recent years have seen concerted efforts to integrate severe acute malnutrition (SAM) treatment into existing health services, including in complex, high-burden, low-resource settings.

What this article adds: Community management of acute malnutrition (CMAM) in Sudan has transitioned from a parallel humanitarian response to a government-led, integrated national programme that targets the total burden of malnutrition equitably across the country. An evidence-informed and planned expansion of services in the health system led to a fivefold increase in number of children treated (47,659 in 2010 compared to 230,000 in 2016), reaching half the total annual burden of SAM in Sudan, with geographic reach to non-emergency states. Local ready-to-use therapeutic food (RUTF) production increased fourfold from 2013 to 2016. While still dependent on humanitarian funding, scale-up costs are increasingly met by government and development funding. Key factors for success included evidence-based decision-making; local level (bottom up) planning; early government engagement, leadership and ownership; strong technical support from UNICEF; solid leadership and coordination facilitated by a CMAM Technical Working Group; cost efficiencies of integrated versus vertical programming; and robust mentoring and monitoring systems. A dynamic interplay, rather than a shift between emergency and development risk-informed programming, has guided the scale-up approach.

Background

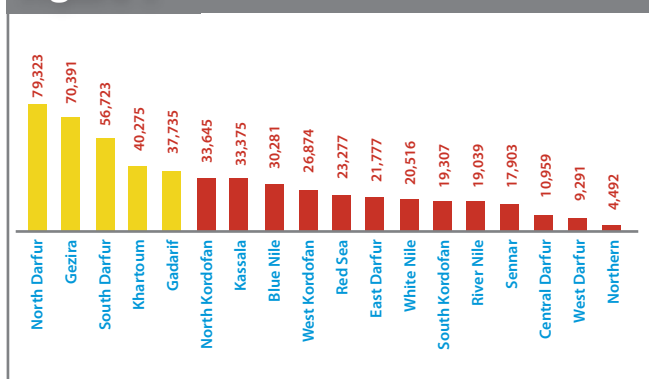
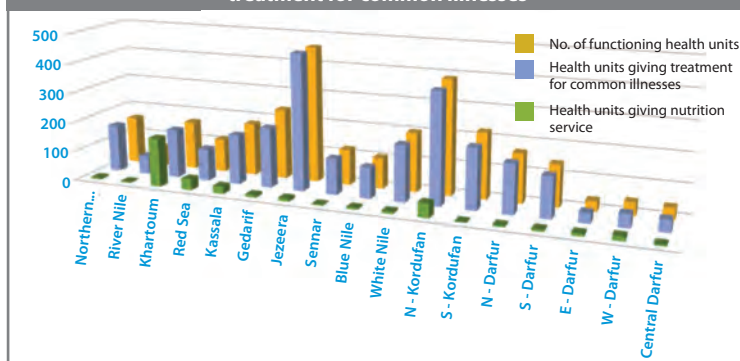
Sudan is the third-largest country in Africa in terms of landmass, with over 720,000 square miles hosting a population of over 40 million. Most of the eastern and northern parts of the country are part of the Sahara desert, characterised by sparse population and harsh environmental conditions, with some irrigable land along the Nile River. Effective service delivery is therefore challenged with sparse population and a poor infrastructure that is often distant from communities. In addition, the protracted conflict for over a decade in western and southern parts of the country, particularly in Darfur and Kordofan, have resulted in displacements and security challenges for effective healthcare delivery, generating major humanitarian needs.

Sudan was among the first few countries globally to adopt the outpatient treatment approach for treating severe acute malnutrition (SAM) in the early 2000s. However, services largely remained part of emergency responses supported by humanitarian actors and hence were confined to internally dis-

placed populations (IDPs) and refugee camps for the better part of the decade. With closure of many non-governmental organisation (NGO) programmes in 2008/2009, capacity for SAM treatment dropped significantly and only started to increase again by 2011. When the first national survey of nutritional status, using S3M¹, in late 2013 indicated that over half a million children were severely acutely malnourished, it triggered discussion on the need for a much faster and geographically wider scale-up of community-based management of acute malnutrition (CMAM) response.

This article shares the experience of Sudan's journey towards an integrated and accelerated CMAM scale-up over the past few years. It is a remarkable success story of scaling up in the context of ongoing complex emergencies, limited presence of NGOs and low health sector financing; and leveraging short-term humanitarian funding to support scale-up while strengthening health systems in the

¹ Simple Spatial Survey Method

Figure 1 Five states with the highest burden of SAM in Sudan**Figure 2** Number of functional health units providing nutrition services in comparison with health units providing treatment for common illnesses

absence of longer-term development funding. While the efforts for accelerated scale-up encompass both SAM and moderate acute malnutrition (MAM) management, this article focuses on the SAM component in order to describe the story clearly and in depth.

Planning for scale

Success starts with good leadership and team work

To lead national efforts on CMAM programming, in 2010 the Ministry of Health (MoH) established a CMAM technical working group (TWG) headed by Dr Ali Arabi from Khartoum University, supported by the CMAM unit in the Nutrition Department of the MoH and with active participation of UNICEF, the World Food Programme (WFP), the World Health Organization (WHO) and NGO partners. Under the leadership of the Director of Nutrition, Salwa Sorkatti, in consultation with the TWG, scale-up plans were developed, technical guidance formulated and implementation actions undertaken. Besides its role as co-lead with MOH for the nutrition cluster, UNICEF also provided significant support to the TWG, including technical and financial support for the S3M survey, evidence-based planning for the scale-up, procurement of ready-to-use therapeutic food (RUTF) and the implementation of the CMAM programme, particularly with respect to the treatment of SAM.

Failing to plan is planning to fail: evidence-based planning from the bottom and up

After years of limited information on the scale of the nutrition problem in Sudan, the S3M survey undertaken in 2013 highlighted a prevalence of acute malnutrition above the 15% emergency threshold in 54 out of 184 localities across Sudan; a total burden of more than two million acutely malnourished children nationally, including half a million severe acutely malnourished children. Yet the capacity to treat SAM (and MAM) in 2013 was relatively low, focused only on states with complex emergencies. Results of a concurrent evaluation of the CMAM programme in 2013 emphasised the lack of a coherent plan for scaling up across the country as one of several key gaps (Tanner and Walsh, 2013). Based on these results, the MoH, together with the national CMAM TWG, embarked on the development of a costed CMAM scale-up

plan. Planning workshops were held in each of the 18 states in Sudan where the nutrition officers and the maternal and child health (MCH) officers from each locality were supported to use the information from the S3M survey to prioritise hot spot areas in their locality. The locality-level planning contributed to state plan development and finally the national CMAM scale-up plan, based on meetings with the respective state heads of nutrition and close collaboration by members of the CMAM TWG to refine and finalise the plan.

The prioritisation dilemma – equity or burden?

Two of the top five states with the highest caseload of SAM, accounting for half the overall SAM burden (Gezira and Khartoum), were states not considered to be in any emergency (see Figure 1). While Gezira state had the second-highest burden of SAM, there was no CMAM programme as it was not among the internationally supported states for emergency nutrition response. Hence, a major debate started on whether to prioritise states based on SAM prevalence or based on the absolute number (burden) of SAM children to maximise number of lives saved. Donor support has traditionally focused on areas of Darfur, Kordofan and eastern Sudan, where prevalence of acute malnutrition is relatively high. This was one of the key factors which led the MoH to step in and mobilise domestic resources to cover the high-burden states (as well as high-prevalence states) and ensure universal availability of CMAM treatment across Sudan. Between 2015 and 2016, the government contributed USD10.8 million in cash to the scale-up of CMAM, which is estimated to cover about a quarter of the overall cost for supply, training, mass screening and monitoring activities. When human resource and other health system costs are considered, the overall MoH contribution is 50% or more.

Increasing the coverage of the programme

As part of the CMAM scale-up plan, key barriers for attaining sustained high treatment coverage were identified as distances to services, weak supply chains, overly complicated tools and procedures, weak linkages with health facilities and low awareness of malnutrition by communities

(see Box 1). These were further analysed and discussed in detail and opportunities for improvement were identified. Subsequently, development of new or improved tools, training materials and protocols was undertaken with effort to address these anticipated bottlenecks for sustained high coverage, as well as to capitalise on the opportunities presented within the Sudanese health system, including the potential for CMAM integration with treatment of common illnesses at family health-unit level (see Figure 2). Mass mid-upper arm circumference (MUAC) screening twice a year was also adopted as the key approach to early case finding, complemented by routine screening exercises in localities supported by NGOs.

Marching towards better capacity at scale

From task-shifting to task-sharing in the treatment of SAM

Severely malnourished children in Sudan primarily received treatment from a lower level of cadres (nutrition educators), rather than medical assistants; CMAM treatment was regarded as a separate nutrition intervention outside their responsibility. Nutrition educators have insufficient clinical training or experience, increasing risk of case mismanagement, and this approach is unsustainable. It was recognised that big gains can be achieved for CMAM by integrating case management of SAM into treatment of common illnesses so that the medical assistant, or other clinicians in charge of a facility, would actively lead the management of all sick children, including malnourished children, and decide on the appropriate course of action and follow-up by the wider health facility team. This policy decision was endorsed by senior health managers at national and state level. Accordingly, a training model was developed (see Figure 3) to equip health workers quickly at scale so that the task of managing a severely malnourished child was shared, from the least clinically skilled nutrition educators in most rural health facilities to the medical assistants supported by the nutrition educators during weekly follow-up.

Development of simplified tools – simple to the end user, not so simple to devise

While treating uncomplicated SAM in the early stages is relatively easy, treating a severely mal-

Box 1 Key challenges for attaining sustained, high-treatment coverage for acute malnutrition as reflected in the CMAM scale-up plan (January 2015)²

- **The scale of SAM:** Over half a million children aged six to 59 months are estimated to be severely malnourished. This necessitates very fast scale-up of CMAM to as many health facilities as possible. However, the pace of scale-up depends on many factors, including finance, the number and composition of health workforce at the lowest level of primary healthcare (PHC), supplies, and delivery of required technical skills for the health workers.
- **Complex emergency:** The prevalence of malnutrition varies from state to state in Sudan. Some of the most affected states are also affected by protracted conflict. This results in limited access to some high-burden areas due to security constraints.
- **Role of the health workers:** While management of SAM is a common practice in paediatric wards after the children have developed clinical complications late in the course of the illness, it is not usual for the PHC-level health workforce to routinely diagnose and treat SAM. The CMAM evaluation indicated that outpatient treatment (OTP) is currently not well integrated into PHC. In large part this is due to nutrition being implemented as a separate activity and by nutrition staff rather than health workers. When malnutrition rates are high, local or international NGOs may set up emergency nutrition response in the localities affected by a complex emergency. This may have contributed to the perception that treating malnourished children is not part of the responsibility of the health worker. Such misperceptions need to be corrected as a child with SAM has the same right to treatment as any other child with common illnesses. The health worker responsible for treatment of common illnesses should make sure that all children are treated for common illnesses, including malnutrition.
- **The link between nutrition and medical staff at facility level:** In MoH-operated inpatient sites, the nutritional protocol was followed, albeit inconsistently, as per the CMAM evaluation undertaken in 2013. The same MoH nutritionists who manage OTPs are also managing inpatient care. There is little link between the nutrition staff and medical staff. As a result there is inadequate linkage between the nutritional and medical management of cases and little nursing care in many sites. In many stabilisation centres (SCs) visited, there was no nursing supervision during the night. Mothers were left to prepare milk themselves.
- **The need for further decentralisation of services:** The existing health facilities are frequently not within a 5 km radius of catchment communities. This means that many families have to walk for more than an hour to access services, even for outpatient treatment. This contributes to later presentation whereby families come for treatment only when children are seriously ill.
- **The link between health service delivery and the community:** As indicated in the Maternal and Child Health (MCH) acceleration plan³, the high number of communities and low number of community health workers has contributed to a gap in the available services in the health system and their utilisation. A generic CMAM community mobilisation strategy is currently under development in Sudan⁴. This strategy is meant to serve as a tool for all community mobilisation of MCH services through better linkage of health facilities and communities, building on existing community level initiatives.
- **Maintaining a smooth supply pipeline:** CMAM supply management is highly complex and, at times, the rate limiting factor for CMAM scale-up. The weight and volume of supplies for treatment of malnutrition are bulkier compared to those for other common illnesses. The supply systems and structures of the health sector do not often have adequate storage space, particularly at the lowest levels. In addition, and related to this, delivering supplies from locality to health facility level is often a challenge, resulting in stock outs.
- **Cumbersome tools and procedures in OTP management of SAM (Collins et al, 2006):** Based on the 2013 CMAM evaluation recommendation, simplified tools and protocols are needed to treat early-stage SAM in the community. This is to ensure simple doable actions to the users, limiting non-essential information to the extent possible.

nourished child with complications who has presented late is complex and requires a higher level of skills (Collins et al, 2006). Hence, based on the 2013 CMAM evaluation recommendation, the TWG commenced on the development of simplified tools and protocols to treat early stage SAM in the community or at lowest levels of health facilities. This aimed to provide simple, doable actions to the users, limiting non-essential information to the extent possible.

Several consultative meetings were held in late 2014 where the TWG reviewed in fine detail the simplified materials drafted by members. Operational guides for outpatient management of severely and moderately malnourished children were developed as small pocket books (A5-sized) and translated into Arabic. These were then en-

dorsed by the senior paediatricians in Sudan.

The rollout of training and transfer of skills using the tools were key considerations as the materials were developed. The training sessions used the operational guides as participant reference, so that every trainee was familiar with her/his pocket reference. A facilitator guide was developed using adult learning principles (only one introductory PowerPoint presentation). A snapshot of each of the materials developed and used in Sudan can be found in Box 2.

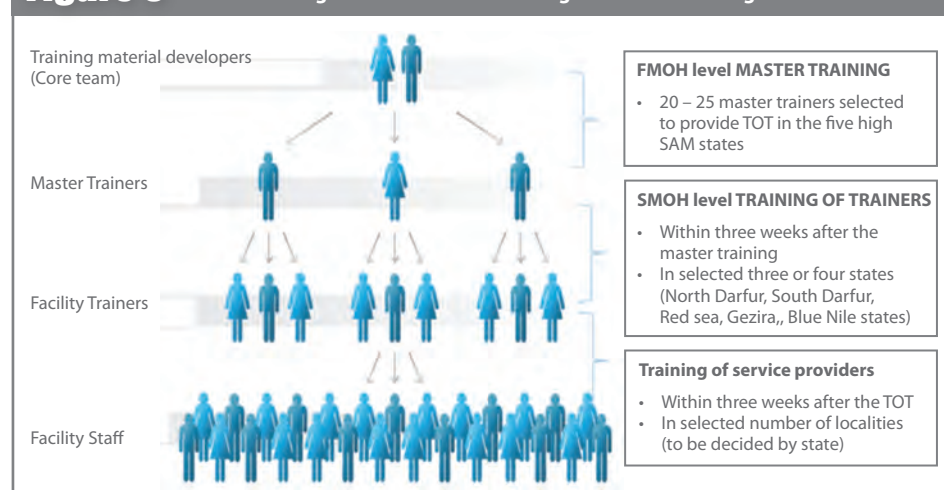
Rollout of training and expansion of service provision

In the first half of 2015, two master trainings were undertaken at national level followed by

state-level training of trainers (TOTs). As per the cascade training conceptual model (see Figure 3 above), this was followed by locality-level service-provider trainings in the second half of 2015. Members of the TWG and master trainers were assigned to support and oversee each of the lower level trainings for quality assurance. The last day of training was used to plan the next course of action. For instance, at the end of the training, the TOTs were grouped by locality to plan the date and venue of the service-provider training. Similarly, the last day of the service-provider training was used to plan the date for starting CMAM services in their respective facilities. For example, service providers were requested to outline the support required while the organising team, together with MoH and UNICEF, used this information for subsequent follow-ups to ensure that the requested inputs were received.

Through the cascade training, 115 master trainers, 395 TOT, and 2,761 service providers were trained covering all states in Sudan. Based on the training and the immediate, context-specific detailed planning, an additional 420 new OTPs were opened in 2016, a significantly

Figure 3 CMAM training cascade model for rolling out CMAM training in Sudan









² MoH National Plan for Scaling Up of CMAM in Sudan 2015 – 2018. Jan 2015

³ The MCH acceleration plan was launched in 2013 by the MoH with the primary aim of accelerating the progress towards achieving Millennium Development Goals (MDGs) 4 and 5. This plan and existing policy-level commitment was used as an overarching document towards which the scale-up of CMAM will contribute through more lives of children saved.

⁴ An operational guide for community engagement for CMAM was subsequently developed and several mass screening activities undertaken.

Box 2 Simplified tools and materials developed for CMAM scale-up in Sudan in late 2014 and early 2015

Name of document		Description
National plan for scaling up CMAM in Sudan		This is the umbrella roadmap detailing the CMAM scale-up plan, with clear targets by locality for severely and moderately malnourished children to be reached, number of facilities to be equipped to provide the service and an M&E framework.
Operational guide for OTP management of SAM – Feb 2015		This operational guide was officially launched by the under-secretary of the MoH. This reference material is distributed to each of the under-five clinics or OTP sites that manage uncomplicated SAM. It was developed in English and translated into Arabic and is used as a pocket quick reference during service delivery and as a participant reference material in the training rollout.
Facilitator guide – management of acute malnutrition at PHC level – Feb 2015		Developed in English, used to train health workers/nutritionists in the three master trainings and subsequent TOTs and service-provider trainings. It has a facilitator guide translated into Arabic to facilitate lower level training rollout. PowerPoint presentations are avoided and the material is used as a step-by-step guide for participatory adult learning through facilitation.
Operational guide for management and prevention of MAM – Feb 2015		Developed in English, translated into Arabic and used as a participant reference material in the training rollout. This is a similar guide as the one for OTP, with a similar purpose. For ease of reference and use, the guides were crafted as two separate pocket reference materials in Arabic.
Operational guide for community engagement		This was drafted following the consultative workshop 19-20 August 2015. The community mobilisation model, called Jabana model, was developed and fully adopted in Kassala, Gedarf and Red Sea states. In addition, use of mother support groups (MSGs) to undertake MUAC screening was adopted by Kordofan, Darfur and eastern states in Sudan.
Joint nutrition mentoring score card		This is a score card developed in 2015. Consultants were recruited and deployed to mentor the health facilities providing CMAM (both newly open and existing). Score cards were updated further in 2016.

higher number than 2015 and comparable to the total number of sites opened in 2012-2014 (see Figure 4).

Strengthening health facility – community linkages

With the sparse population and harsh environmental conditions in Sudan, health-seeking behaviour is relatively low and expanding the availability of services has not resulted in a comparable utilisation of services. Similar observations have been documented by the Coverage Monitoring Network in many other settings,

where the decentralisation of care improved availability but did not ensure accessibility (Guerero and Rogers, 2013). Thus, several efforts were made to improve demand for services. These include development of a model for community mobilisation (called Jabana model⁵), biannual mass screening and use of mother support groups (MSGs) to undertake MUAC screening. Several approaches have been used in various combinations as different communities have different contexts and one approach does not work everywhere. The MSGs were effectively used in Darfur states, Kordofan states and

Kassala in conjunction with mass screening. Jabana model was particularly effective in eastern states, especially in Kassala. The Government of Sudan invested significantly in mass screening activities as the CMAM community component required time for communities to understand, and in the meantime the target numbers of SAM were not being reached adequately. Mass screening activities undertaken in August and September 2016 reached 4.3 million children aged 6 to 59 months out of an estimated 6.8 million children in Sudan (70.2%). Children identified as malnourished were linked immediately with the newly expanded CMAM services for treatment.

Shift from emergency focus to long-term, risk-informed programming for CMAM

Increased government investment for CMAM

As the owner of CMAM programmes that are implemented within the health system, the MoH contributed to all aspects of CMAM costs, including programme costs (human resource, training and M&E); health-system costs (hospitals and health facilities costs); and treatment inputs (therapeutic feeds and drugs) as part of the MCH acceleration towards universal healthcare coverage to reduce child and maternal mortality. Before 2015, the government contribution towards CMAM was minimal as relatively few government facilities were treating SAM children and the cash allocation to CMAM supplies and monitoring was also low. This has changed markedly in the past few years, evidenced by the increasing cash allocation and the absorption of administrative costs as many more MoH facilities integrated the treatment of SAM. Since no CMAM costing exercise has been undertaken in Sudan recently, only direct cash investments are shown in Table 1 as an example of increasing investment from government.

Public-private partnership for improved RUTF supply chain

The scale-up saw a rapid expansion of the volume of RUTF, which overwhelmed the warehousing and transportation systems at national and state levels. Through a private partnership with UNICEF, a local producer (SAMIL) established five storage hubs in emergency hot-spot areas, in addition to an existing one in Khartoum, and pre-positioned RUTF supplies for timely access. Moreover, the local producer was willing to produce without an order in hand, allowing forward planning even when there were no funds immediately available. This resulted in significant reduction in the lead time for RUTF delivery to the states by up to three months, saving the time of production, custom clearance, and transportation to state level where some states require security clearance.

Figure 4 Number of sites offering CMAM services in Sudan



⁵ Jabana model is a community engagement/mobilisation model with four steps for effective community engagement for improved community awareness, early case identification and defaulter tracing: 1) Mapping; 2) Partnership; 3) Engagement of women and caretakers; and 4) Monitoring progress and use of technology.

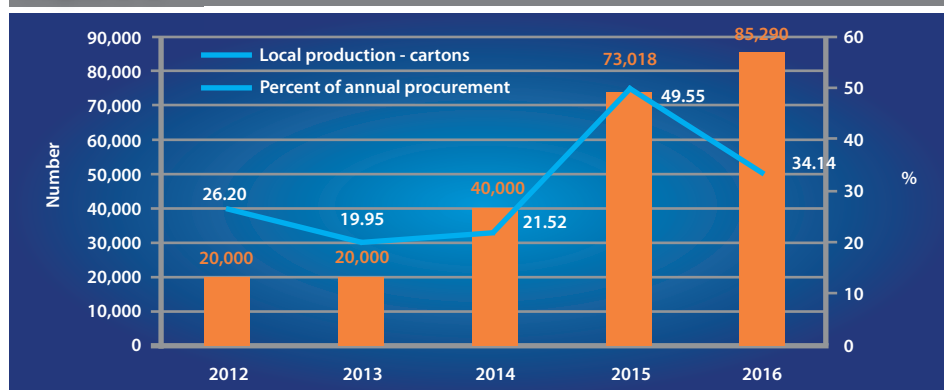
Table 1 Cash contribution of MoH towards CMAM in the period 2016/2017

	Government cash contribution to CMAM (USD)	Description
2016	1,669,422	For RUTF, RUSF and screening
2017	9,187,248	For RUTF, RUSF, F100, F75, anthropometrics (MUAC tapes, weighing scales), nutritional screening and operational costs
Total	10,856,670	

Between 2013 and 2016, the contribution of local RUTF production for CMAM in Sudan grew fourfold (see Figure 5). This is likely due to the growing and more reliable institutional market and investments in local production capacity. While absolute cost of local versus international supply is currently higher, there are additional benefits; local production stimulates local jobs and markets, providing additional incentive for government contribution, and should save cost and time in the long term. The local producer, SAMIL, has successfully negotiated with the government on removal of value added tax (VAT) on RUTF, which has led to significant reduction in the price of RUTF and has made local procurement more cost effective.

Real-time monitoring for results

There was recognition that the effectiveness of cascade trainings is very limited unless followed by intensive mentoring and supportive supervision. A core monitoring team was established at state level composed of MoH, UNICEF and NGO partners where they were present. Based on discussion with the MoH, UNICEF recruited experienced nutritionists to support the state monitoring

Figure 5 Contribution of local RUTF production in Sudan⁶

teams in providing high-quality mentoring and monitoring, targeting facilities offering CMAM services, particularly in high-prevalence and low-capacity localities. The objective of real-time monitoring had been to strengthen the correct application of the national guidelines for the management of SAM. Hence, in addition to support for individual case management, it included support to strengthening current reporting, supervision, community mobilisation and supply management systems within the MOH.

UNICEF adopted the Kobo toolbox in 2015 to enhance the monitoring activities. Kobo toolbox applies smartphone technology, allowing real-time access to information by multiple users, hence providing real-time data on monitoring findings, and allows timely remedial action and response where necessary. Kobo also provides spatial maps on overall coverage of monitoring of interventions (see Figure 6) and has improved accountability of individual contractors engaged for monitoring, as well as donor confidence in the reliability of monitoring systems for CMAM.

Kobo has been used in 969 facilities with OTP out of 1,110 in 13 states (about 87% of all

OTP sites). Looking at the encouraging results from UNICEF support to Kobo in areas with complex emergency, the MoH has decided to adopt the approach nationwide, including both the standard score cards and Kobo. This will further increase the coverage of monitoring. The ministry is planning to have three levels of monitoring:

- National-level monitoring: through the national CMAM team or the national TWG member(s);
- State-level monitoring: each state has a dedicated CMAM coordinator to monitor locality implementation; and
- Locality-level monitoring: each locality has a locality focal person to monitor implementation at the centre levels.

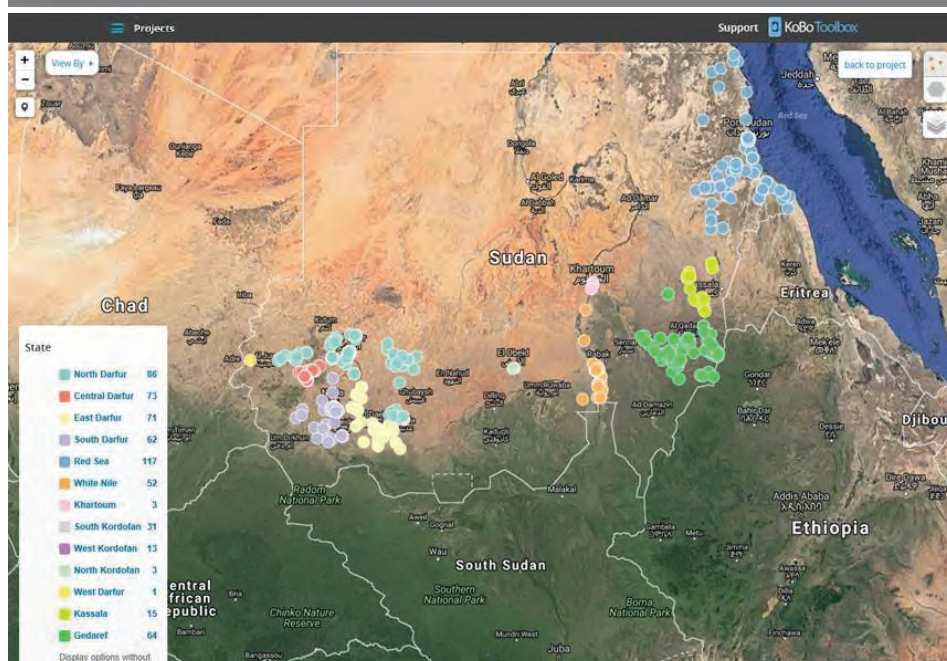
Strong information system

The CMAM database is a key component of the nutrition information system in Sudan. It allows states and the national MoH to monitor progress on the number of facilities newly offering SAM treatment and the actual number of SAM admissions against the target in the national scale-up plan on a monthly basis. This has allowed focused efforts for scale-up and community mobilisation in localities that were falling significantly short of targets.

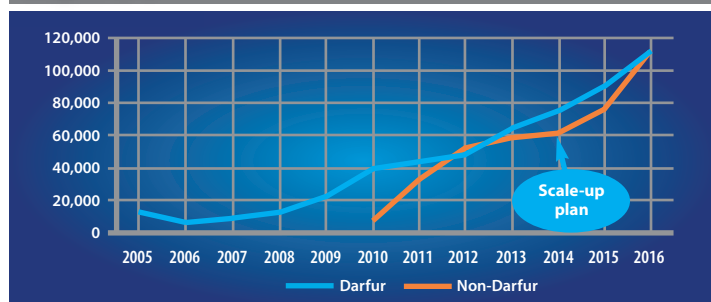
Reflections and lessons learned

Bridging the humanitarian-development nexus

On closer look at the states contributing to SAM admissions, a progressive shift from short-term, emergency-focused and internationally led CMAM programming to a longer-term, government-owned and led national CMAM programme which is more closely integrated within health service delivery can be seen. Prior to CMAM scale-up plan in 2015, the SAM admissions in non-Darfur states were plateauing because of limited investment. CMAM scale-up as per the national scale-up plan resulted in increased SAM treatment availability in non-Darfur states through integration within the health service delivery

Figure 6 An example of a spatial map generated by Kobo showing number of sites visited during CMAM monitoring in 2016

⁶ In 2014, a one-off grant from USAID Food For Peace (FFP) to procure locally instead of in-kind supplies led to a sharp rise in production in 2015. The reduction in amount procured in 2016 is largely related to an increase in in-kind donation from USAID FFP. Also, the local producer had an issue with quality assurance (high aflatoxin in some batches); a thorough review of the production chain stopped production for some time.

Figure 7 SAM admissions in Darfur states versus non-Darfur states

platform. States considered non-emergency like Gezira, Northern and River Nile states went from virtually no functioning CMAM programme prior to mid-2015, to treating over 9,200 severely malnourished children in 2016 alone (see Figure 7). This has been achieved because of government investment to procure supplies and for training rollout as humanitarian funds do not cover these states. In addition, the Government of Sudan invested significantly in mass screening on a biannual basis, progressively increasing the non-emergency contribution to CMAM programming.

While recognising the progressive geographic spread of CMAM in Sudan, it is important to acknowledge that the scale-up of CMAM, including the investment in the supply chain and monitoring system, has largely been supported by humanitarian funding with increasing government contribution and non-emergency fund-

ing. As Sudan invests in CMAM scale-up as an example of risk-informed programming, the emphasis is not so much on a shift from emergency to "development" programming, but rather an ongoing and constant interplay between development and emergency considerations, resulting in a sufficient investment to improve the capacity of health systems to be effective and efficient.

Due to ongoing CMAM scale-up efforts as part of routine services, the number of children accessing treatment at all times has increased significantly. For example, in 2016 alone, a total of 224,517 children received treatment for SAM through the national CMAM programme. This represents an additional 57,400 children receiving treatment for SAM compared to 2015, which is more than the total number of children treated in Sudan in 2010 (47,659) (see Figure 8).

Figure 8 Annual admission for management of SAM in Sudan

There are several key success factors for CMAM scale-up in Sudan (see Box 3). The approach was built on evidence based, bottom-up planning led by government with strong technical support and coordination arrangements. In addition, CMAM scale-up in Sudan is the result of concerted efforts of all organisations working in nutrition with government. This has resulted in efficient and effective expansion of access to service delivery that was augmented through community mobilisation and mass screening. CMAM programming has effectively transitioned from a parallel humanitarian focus to an integrated, government-led programme. The approach has been to get CMAM at a sufficient scale to be meaningfully integrated within the treatment of common childhood illnesses in every health facility, including integrated management of neonatal and childhood illnesses (IMNCI) and integrated community case management (iCCM). The lessons from CMAM scale-up will contribute to the overall improvement of availability and access to treatment of common childhood illnesses. Thus, CMAM presents an excellent opportunity for the Sudan health sector as a step towards universal health coverage.

The findings, interpretations and conclusions in this article 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.

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Box 3 Lessons learned on key success factors for CMAM scale-up

Evidence-based decision making: The need for scaled-up response was evidence-based. The national S3M study as well as the CMAM evaluation, both undertaken in 2013, heavily informed key actions for scale-up. In addition, a roadmap document was prepared as part of the scale-up planning process that presented analysis of the health system opportunities for integration with compelling evidence for task-sharing. The nutrition information system allowed tracking of admissions against targets, as well as treatment outcome indicators so that sufficient coverage is reached with optimal quality of service.

Bottom-up planning: The scale-up plan followed a bottom-up planning process whereby each of the 18 state MoHs held CMAM scale-up planning workshops. The plans were later revised at opportune times, enabling maximisation of the opportunities presented by the healthcare delivery platform through integration. This improved the ownership at sub-national level, allowing for implementation of the new directive on task-sharing in the treatment of SAM.

Government leadership and ownership: Every step of the CMAM scale-up was undertaken with strong engagement and leadership of the MoH. Both the S3M survey and CMAM evaluation were undertaken with full ownership of the MoH, hence follow-up actions were strongly owned and led by the MoH. The federal MoH led the consolidation of the national plan and the development of all relevant tools. It also allocated resources for implementation and monitored the implementation of the CMAM scale-up against the plan. The state MoHs organised planning workshops and later followed through the plan to make it a reality through supporting localities and facilities.

Strong technical support from UNICEF: The UNICEF Sudan office provided significant financial and technical support that facilitated government's efforts for scaling up. In addition to supporting both the S3M

study and CMAM evaluation financially, UNICEF facilitated recruitment of consultants to provide technical support to the state-level planning exercise, on-job training and supportive supervision. A full-time technical assistant was recruited to work closely with the MoH to enable finalisation of the nationwide plan, development of required technical tools and materials, and support the implementation of scale-up. All of this was possible because of donor investment to complement government efforts.⁷

Strong leadership and coordination: The CMAM TWG was used as a convening body for overall leadership and technical oversight of the CMAM scale-up process. Since the complex emergency has inevitably resulted in a complex relationship among various partners, the TWG played a vital role in providing technical leadership, as well as coordinating all partners to reach a common consensus.

Cost efficiency: The shift from vertical planning of CMAM scale-up to a harmonised and integrated approach has enabled major cost savings; treatment of SAM has been taken up by existing health workers as part of curative services to be offered in their facilities.

Well structured training and skill support: The training rollout was cascaded at a rapid and pace and organised manner, enabling sufficient capacity of service providers in a short space of time. Simplified pocket reference material was used as participant guide for all levels of training that remained in use during service provision. Immediate mentoring action was in place to allow supportive supervision and skill support on the job.

Strong mentoring and monitoring system: The availability of a strong and accountable mentoring and monitoring system has been key to ensure quality while scaling up. Use of technology has enabled real-time support and follow-up to address gaps as they arise.

⁷ The key donors that supported the scale up of CMAM include: Office of Foreign Disaster Assistance (OFDA); United States Agency for International Development (USAID); Food for peace; European Commission (ECHO); Department for International Development (DfID-UK); Korea International Cooperation Agency (KOICA); Government of Germany; Government of Japan; Central humanitarian fund (CHF); Central emergency fund (CERF) and Government of Denmark.

References

- Collins, Sadler, Dent et al (2006). Key issues in the success of community-based management of severe malnutrition. Food and Nutrition Bulletin, vol. 27, no. 3 (supplement) 2006, The United Nations University.
- Tanner CG and Walsh A (2013). Review of Community Management of Acute Malnutrition (CMAM) for Republic of Sudan, Valid International, supported financially by UNICEF.
- Guerrero and Rogers (2013). Access for All, Volume 1: Is community-based treatment of severe acute malnutrition (SAM) at scale capable of meeting global needs? (Coverage Monitoring Network, London, June 2013)

Improving Nutrition Information Systems: lessons from Kenya

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

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Location: Kenya

What we know: Strong nutrition information systems (NIS) are critical for timely, effective nutrition emergency response.

What this article adds: Though a Government-led Nutritional Technical Forum had been established during the 2006 drought and a Nutrition Information Technical Working Group (NITWG) initiated, key lessons post 2008 emergency in Kenya prompted a concerted effort to ensure quality nutrition information is available to guide a coordinated programme response. Challenges identified included non-standard indicator use, duplicative and inconsistent data collection mechanisms, and inconsistent results from infant and young child feeding (IYCF) data. Recommendations from a detailed evaluation by the US Centers for Disease Control and Prevention (CDC) were adopted and implemented. These included streamlining indicators and processes in district NIS, aligning anthropometric data with global guidance, capacity development of the drought early warning surveillance system, standardising indicators and survey schedules, and improving data quality of large-scale surveys. Three data clinics were held to critically review and triangulate data, standardise tools and methods and provide stakeholder guidance. A user-friendly, accessible, web-based centralised database was developed. NIS developments improved timely response in 2016 to drought-related emergency. Technical support and capacity accessed and coordinated through the NITWG was instrumental to a successful Kenya Demographic Health Survey (DHS) in 2014. Key components of success were strong government leadership and stakeholder commitment, a strong coordination mechanism, inter-sector linkages, mapping of partner capacity, integration within existing systems, and regular capacity-strengthening. A committed team and structures to follow through recommendations and actions is key.

Background

In Kenya pre-2012, nutrition information for children was mainly collected by the Kenya National Bureau of Statistics (KNBS) through national surveys to inform higher-level planning, while the main government nutrition information system (NIS), the Child Health and Nutrition Information System (CHANIS), collected nutrition indicators at health facilities for monitoring purposes. The health facility's main role was hard-copy data collection (tally sheets) for consolidation at district level; data analysis, review and utilisation at facility level was uncommon. In highly vulnerable areas, small-scale nutrition surveys, mainly at district or lower level, were led and funded by United Nations (UN) agencies or non-governmental organisations (NGOs). Although an integrated SMART survey guideline was available, data collection tools and analysis of non-anthropometric indicators varied across organisations and objectives and data needs were often

donor-driven. Typically, raw data and reports were not centrally available or managed by the Ministry of Health (MoH) and served internal programme needs.

National Nutrition Information Technical Working Group (NITWG)

After reviewing lessons learnt, the nutrition sector agreed to strengthen the Kenya Nutrition Technical Forum (NTF) and the National Nutrition Information Technical Working Group (NITWG), which had been formed during the 2006 drought in Kenya and, led by the MoH, and mainly largely focused on emergency nutrition programmes and information in arid and semi-arid areas. The role of the NITWG was to review and validate NIS in the sector and to ensure timely, quality nutrition information was available to guide programme response. The functions of the NITWG have since expanded to ensuring the establishment and sus-



Moderately malnourished children under the age of 3, pregnant women and nursing mothers receive specialised nutritional support, in Turkana district in north-western Kenya

tainability of a functional NIS through the actualization of strategic objectives 9 and 10¹ of the National Nutrition Action Plan (NNAP) 2012–2017. This aims to strengthen nutrition surveillance, monitoring and evaluation systems and to enhance evidence-based decision-making.

NIS challenges

In 2012/2013, the NITWG identified several key NIS challenges during working group review meetings:

- Indicator definitions and collection methods used were not standardised despite global guidance, especially for non-anthropometric indicators such as infant and young child feeding (IYCF), food security, micronutrient deficiencies and water and sanitation. This severely limited trend/meta-analysis across regions.
- Some monthly health facility indicators reported in the District Health Information Systems (DHIS), such as on breastfeeding and stunting, were difficult to interpret. The stunting indicator from health facilities significantly underestimated the burden of stunting, mainly due to low reporting rates, limited access to equipment, poor quality of height measurements due to limited staff, and age bias (younger children visit facilities more frequently). The indicator on exclusive breastfeeding (EBF) overestimated EBF rates due to self-reporting bias; data were only collected from mothers who visited the health facility and were therefore not representative of the population and there was likelihood of the same mother responding multiple times, depending on how often she visited the clinic. When these indicators were compared to representative, population-based surveys, the results from health facilities were always significantly different, making it difficult to inform programmes on progress.
- IYCF indicators integrated into SMART

surveys had wide confidence intervals, erratic results and were difficult to compare over time.

To address these concerns, in 2013 the NITWG called for an evaluation of the Kenya nutrition surveillance system by the US Centres for Disease Control and Prevention (CDC) with support from UNICEF. The team from CDC Atlanta² evaluated NIS and made several recommendations to improve the system. One of the key recommendations was to support government-led information systems that already routinely collect nutrition data (the DHIS, the National Drought Management Authority (NDMA) early warning system and the national surveys conducted by the KNBS) because they have the widest coverage, enjoy received have government leadership and ownership (therefore constituting a more sustainable approach) and are more likely to be supported by multiple partners. Additional recommendations focused on data quality improvement initiatives across all nutrition information sources and on strengthening inter-sector linkages. The NITWG adopted the evaluation report and prioritised planning and implementation of actions related to improving data quality and reporting across all nutrition information sources. This article shares the experiences of the NITWG in delivering on this remit.

Review of the Nutrition Information System

The regular, twice-monthly NITWG meetings provided inadequate time to address the evaluation recommendations, so a 'data clinic' workshop was held 3–5 September 2013 to review with key partners the indicators, methodologies and timing/frequency of surveys and assessments. The MoH, with technical and financial support from UNICEF and Action Against Hunger (NITWG chair), led the clinic; participants included the World Food Programme (WFP), Food and Agriculture Organization (FAO), NGO partners,

NDMA and food security technical experts. To date there have been three data clinics each tackling key issues of indicator definition, quality, reporting and methodologies (see later), and reviewing the progress and challenges observed since the previous clinic. The following summarises the evaluation findings, recommendations and subsequent actions taken.

District Health Information Systems

The CDC evaluation reviewed 11 key nutrition indicators routinely collected through the DHIS system: underweight, stunting, vitamin A supplementation, iron folate supplementation, treatment of severe acute malnutrition (SAM), treatment of moderate acute malnutrition (MAM), deworming, growth monitoring, early breastfeeding initiation, exclusive breastfeeding and micronutrient powder supplementation. Key challenges highlighted were as follows:

The same indicator was collected in more than one form (e.g. MoH 711 for Child Health and MoH 713 Nutrition Monthly Monitoring) which each used different age categorisations, classifications, and had different reporting rates.

Health facility stunting data were significantly different from survey data. An estimated 10% of the facilities³ had information on stunting at the time of the review; low reporting/poor data quality was mainly linked to limited access to height boards, lack of time and staff for measurement, and skewed age distribution of children presenting at the health centre (majority under one year of age).

Key recommendations and actions taken to address these issues were:

- Standardise reporting where there was more than one form collecting the same information. It was agreed that all nutrition indicators will be reported in one form. To help ensure health facilities had adequate supplies of the required DHIS tools, printing and distribution were supported by UNICEF and WFP.
- Two indicators – stunting and exclusive breastfeeding rate – cannot be accurately reported using the DHIS; these indicators should be collected in population-based surveys only and the NITWG should work closely with the KNBS to ensure accurate collection (including training and developing systems for quality checks on indicators). The NITWG has since offered committed technical support and guidance to ensure quality of nutrition indicator measurements in large-scale surveys conducted by the KNBS, such as the 2014 Demographic Health Survey (DHS) and the Kenya Integrated Household Budget Survey (KIHBS).

¹ Strategic objective 9: Strengthen nutrition surveillance, monitoring and evaluation systems. Strategic objective 10: Enhance evidence-based decision-making through operations research.

² Dr Oleg Bilukha, Associate Director of Science, and Eva Leidman, Epidemiologist – Emergency Response and Recovery Branch, Center for Global Health, US Centers for Disease Control and Prevention.

³ CDC Evaluation Report 2013

Box 1 Nutrition situational analysis to improve emergency response in Kenya

The NITWG worked closely with the DISK to improve the nutrition data collection and analysis process and harmonise data from different sources/times in the seasonal assessments. The critical steps the NITWG took were firstly, to ensure that all nutrition surveys were planned and conducted during the start of hunger season and that the information collected also fed into the long and short rains seasonal analysis. Secondly, the NITWG worked closely with the DISK to review the data collection, quality and analysis of early warning indicators, such as the prevalence of acute malnutrition based on MUAC data collected from sentinel sites. Lastly, the NIWG adapted the nutrition IPC process for analysis in 2014. This was conducted during the seasonal

analysis that takes place in February and August every year.

In 2016, the short rains assessment conducted in February indicated a deteriorating nutrition situation; by the following seasonal assessment in August 2016 it was clear that the nutrition situation was deteriorating further based on the detailed analysis conducted by the NIWG. A detailed nutrition sector response plan was subsequently developed for current and projected needs. Although the government declared a state of emergency as a result of due to the deteriorating food security and nutrition situation in February 2017, the nutrition sector already had a nutrition sector response plan in place and was responding to the situation based

on the information provided earlier from the NITWG.

At county level, the information from the nutrition IPC was also used to help counties access the county drought contingency funding, used to expand outreach services to increase coverage of services for children. The systematic review of nutrition information using the IPC process helped provide a standard and systematic way of reviewing the nutrition indicators for appropriateness and quality. The process allows for comparison across different locations and over time. It clearly articulates the factors likely to be affecting the nutrition situation; this makes it easier to develop appropriate nutrition response plans for the short and long term.

- The NITWG should work closely with counties to support the capacity-building of staff to improve the analysis and quality of data and provide guidance to staff on simple data quality checks, discussing findings in the in-charge facility meetings. Through the support of UNICEF, a nutrition information officer was made available to visit the county health facilities and provide on-the-job training, guidance and support on nutrition indicators in the Health Management Information System (HMIS) system.

National Drought Management Authority early warning surveillance system

The NDMA collects monthly information from sentinel sites in the arid and semi-arid areas (ASAL) of the country. Indicators include food security indicators such as rainfall, vegetation coverage index (VCI), market prices (food and livestock), livestock body condition, water availability and cost, milk production and availability, mid-upper arm circumference (MUAC) in children aged 12-59 months, and health and morbidity data. The evaluation found that MUAC data were reported as the prevalence of children with MUAC < 135 mm, which was referred to as children at risk of acute malnutrition, and not further disaggregated in the categories (1) <135 mm to ≥125mm (at risk), (2) <125 to > 115 mm (MAM) and (3) <115mm (severe acute malnutrition (SAM)) as internationally accepted. It was agreed that applying the standard thresholds for acute malnutrition and improving data quality would help realise the potential of the NDMA early warning system.

To address this, the NITWG linked with the NDMA to review the current data and discuss avenues of improving data quality through joint data quality assurance visits and agreed on capacity-building plans for NDMA information officers. In 2013, UNICEF supported a two-day training for country nutrition officers on nutrition information analysis and reporting. Focus areas were proper measurement technique for MUAC; nutrition indicator analysis, including DHIS information review; and the use

of emergency nutrition assessment software (ENA) for SMART to check the quality of MUAC data sets.

In late 2014 and 2015, with the support of the UNICEF regional office, the NDMA information officers from all ASAL areas were trained on SMART surveys. This enabled them to participate and take ownership of nutritional surveys in their counties and be better placed to report on county nutrition surveillance. The Kenya Food Security Steering Group (KFSSG) Data and Information Subcommittee members and the chairperson of the KFSSG were also trained on SMART and nutrition surveillance methods to better interpret nutrition information. This training was crucial to help the KFSSG key members understand the rigour and processes involved in nutrition surveys and how this information can be used for better programming.

On review, the NDMA early warning system, in consultation with the NIWG, agreed to report the number of acutely malnourished children using the global standards of <125mm and <115mm. For purposes of trends and continuity, children less than <135 mm continued to be reported.

Standardising indicators and timing of nutrition surveys

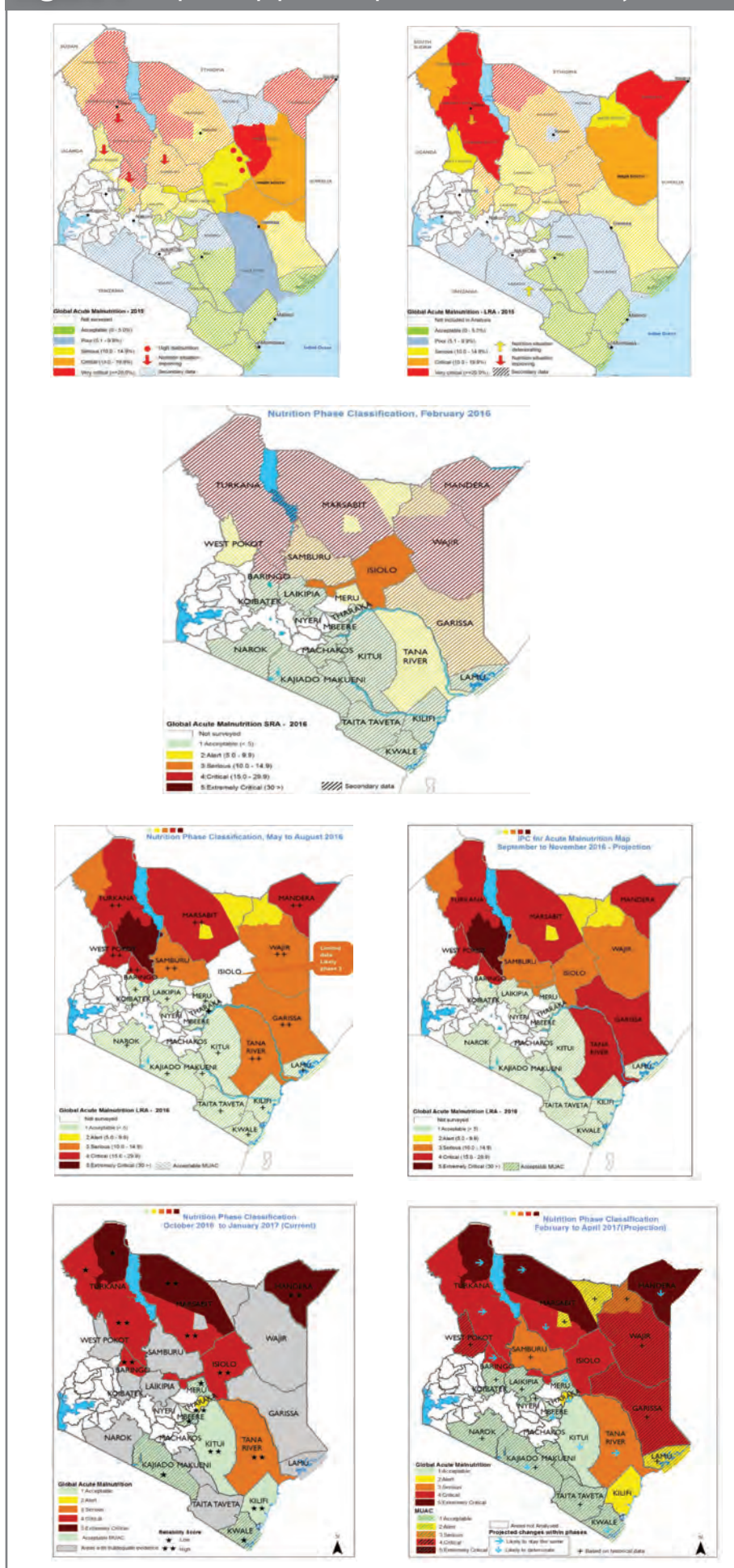
Surveys that collect nutrition information in Kenya included SMART surveys at a county level in the most affected locations, DHS and special nutrition studies and research. To track progress and allow development of a central database of raw data and reports, standardised core nutrition indicators and variables were agreed; during data clinics, minimum indicators and required data were determined for each sector and for maternal and infant and young child nutrition (MIYCN) assessments. Guidance on key technical issues was provided. IYCF surveys should no longer be combined with SMART surveys, as the SMART sample size for children under two years of age is too small for IYCF indicator data collection and IYCF behavioural changes are likely to happen over a longer period, requiring less frequent surveying than is typical for SMART surveys. A coordinated

and standardised survey schedule was also agreed upon. Surveys should be conducted at the start of the hunger season and aligned to food security assessments to allow for complementary analyses. A detailed survey plan, based on consultations with the KFSSG and DISK members, was developed for the drought-prone areas to ensure timely nutrition information collection to feed into overall food security and nutrition seasonal assessments.

These developments enabled the NITWG to more easily conduct Integrated Phase Classification (IPC) analysis for food security and nutrition in most ASAL areas (less information was available for semi-arid parts of the country where surveys were less frequent). For example, the existence of a central database ensured that all data to inform the analysis were available and clearly organised, allowing all partners to review information. This helped the NITWG to monitor data quality and availability across the ASAL areas and work closely with NDMA to improve data quality. In addition, seasonal assessment findings and IPC analysis were released at the Kenya Food Security Meeting (KFSM), a high-level food security and nutrition forum, ensuring that nutrition information was shared with key stakeholders in the country for immediate action. IPC analysis products (IPC maps, showing the most affected areas, (see Figure 1 for examples) the caseloads of children affected with malnutrition and key recommendations) were shared in a one-page infographic. This quickly highlighted the nutrition situation, the number affected and the immediate assistance required. Released alongside the food security analysis, this report forms the basis for the sector emergency response plan that is produced both at national and county level, which is used to plan for interventions and mobilise required resources. An example of how timely, integrated assessment has informed emergency response is shared in Box 1.

National surveys: DHS and micronutrient surveys

The NITWG also committed to work very closely with the KNBS and take an active role in their

Figure 1 Examples of maps produced as part of nutrition situational analyses

training, standardisation tests and field supervision during national surveys to improve the quality of nutrition indicators collected in large-scale surveys. The NITWG worked closely with KNBS during the Kenya DHS in 2014 to improve the quality of nutrition indicators (see Box 2).

Data quality assurance activities

Data clinics

The main objective of the nutrition data clinics was to critically review all nutrition indicators across every source of nutrition information (surveys, DHIS, sentinel sites) to standardise tools and methods and provide guidance to all key partners and stakeholders. Linkages with the Water, Environment and Sanitation Coordination sub-sector coordination group (WESCORD), KFSM and the HMIS were strengthened, making it easy to improve data collection, analysis and dissemination. A second data clinic (the first was in 2013; see above) was held in 2015, informed by a prior technical meeting between the NITWG and the micronutrient working group. The meeting reviewed micronutrient programme monitoring. The specific aims were to streamline micronutrient indicators in both routine and population-based data sources and to ensure that information collected is what is required to improve micronutrient programmes. The subsequent data clinic exercise focused on programme monitoring and coverage and linking information to action.

The NITWG identified measuring coverage and establishing strong linkages with other sectors as two of the main challenges to ensuring the proper use of integrated nutrition information. The recommendations from both data clinics held in 2015 have been adapted and have proved useful in improving overall reporting of nutrition indicators. The NITWG is in the process of finalising a manual that consolidates guidance on conducting coverage assessments using various coverage assessment methods such as SQUEAC, LQAS and KPC⁴.

Joint data quality assurance activities

The NITWG partners drew up plans to support joint data quality review visits to health facilities, working with county government staff and county partners to review data at facility and county levels. The visits were supported by the national HMIS officer and UNICEF information officer. Partners also worked closely with NDMA county information officers to review data collected at sentinel sites and provided training to the field enumerators on MUAC measurements. These activities supported the improvement of data quality at the county level. NDMA information officers used ENA software to discuss quality issues with field enumerators.

Data access

There was a need for central storage of data, accessible to all stakeholders in a user-friendly format. This led to the development of the Stat Planet web-based database with spatial features and an online interactive dashboard (www.nutritionhealth.or.ke). Both anthropometric and non-anthropometric indicators from 2009 forward are included.

⁴ Semi-Quantitative Evaluation of Access and Coverage (SQUEAC); Lot quality assurance sampling (LQAS); Knowledge, Practice and Coverage (KPC)

Box 2 Commitment of technical and financial support to the DHS 2014 and use of results to inform planning

In 2013, the governance system in Kenya changed to a devolved system, with 47 counties now having functions distinguishable between national and county governments. Devolution of health services created an immediate data gap for health and nutrition indicators at county level. This needed to be addressed urgently to inform county-level planning. The country had been due for a DHS in 2013/2014 (the DHS is the most cited survey in health and nutrition policy documents in Kenya). Previous DHS provided statistics at regional level (formerly eight provinces). The DHS was considered an important opportunity to establish county demographic and health estimates. However, the cost and sample size required to allow the production of county-level statistics for 47 counties instead of only eight regions were estimated to be three to four times higher than the previous DHS. Data quality concerns, given the scale of the survey and high cost, dominated the agenda of the DHS steering and technical committees.

Intense resource mobilisation, more complex planning and execution of the survey were required. The health sector was determined to generate county-level statistics as health was

now a devolved function. The sample size increased from the initial planned sample of around 13,000 to over 40,300 households. The survey was to be funded by the Government of Kenya and United States Agency for International Development (USAID), but they had not planned for one at such scale; thus sectors were requested to approach their respective partners to support the survey technically and financially. The nutrition sector representatives in the technical committee committed to consult within the sector and mobilise technical and financial support. The representatives then asked the MoH Head of Nutrition for permission to call for support from partners through the national Nutrition Technical Forum (NTF), steering committees and working groups to inform partners about the funding and technical gap.

NITWG agreed to provide technical support. The MoH seconded one Nutrition Officer for ten months to offer technical support. Additional funding for the standardisation test during anthropometry training was provided by UNICEF through Action Against Hunger. Nutrition sector partners allowed their staff to be released from

normal office duties to provide support during anthropometry training. The agencies also supported travel, accommodation and other costs. CDC staff provided remote technical support throughout the exercise. WFP and the Micronutrient Initiative also provided financial and technical support to collect food and nutrition indicators. None of the partners were directly involved during planning, training or data collection in previous KDHS surveys.

The Kenya DHS 2014 was successfully conducted. Information on key nutrition indicators such as vitamin A supplementation, child and women anthropometry and iodisation of salt are now available at county level. The information has already been used in key county planning documents such as the County Integrated Development Plans, County Health Sector Strategic and Investment Plans and County Nutrition Plans. The results have also helped the national government identify and prioritise counties with greatest needs. For example, West Pokot and Kitui counties had the highest prevalence of stunting in the country, while Turkana, Marsabit and Mandera counties had the highest prevalence of wasting.

Discussion and conclusions

Several key facilitating factors have helped enable improvements in the Kenya NIS. The first relates to a strong policy environment, the existence of a common results framework and government leadership, which have all of which have greatly aided its improvement. The Government's commitment to strong a NIS is reflected in the Kenya Food and Nutrition Security Policy (FSNP) and the Kenya NNAP 2012-2017. Key priorities stipulated in the FSNP and that which are further unpacked in the NNAP 2012-2017 include:

- Strengthen networking and coordination of relevant sectoral and integrated databases of all stakeholders and their applications to enhance all aspects of food security and nutrition analysis, understanding and activities in Kenya;
- Enhance the collection and use of knowledge and information at the national, county and community levels;
- Encourage monitoring of food consumption and dietary indicators;
- Support systems to enable feedback of information effectively in appropriate formats on food security and nutrition to priority audiences, including national, sub-national and community levels, using appropriate media;
- Strengthen nutrition surveillance, data collection, analysis and dissemination; and
- Promote use of technologies to enhance cost-effectiveness, timeliness in reporting and user-friendliness.

A system for monitoring and evaluation (M&E) has further been identified as a critical component of the implementation of the FSNP and NNAP

and a National Nutrition Monitoring and Evaluation Framework has been developed. The Framework aims to meet the information needs of different stakeholders. The principles that guide nutrition monitoring and evaluation are:

- "Three ones" principle: One national coordinating authority; one agreed comprehensive national nutrition plan of action; and one agreed country-level nutrition monitoring and evaluation framework;
- Mainstreaming of M&E in all nutrition interventions at all levels;
- Integration of nutrition data elements and indicators in the existing information systems, such as the DHIS (no parallel/vertical systems); and
- Decentralisation, analysis and storage of data at the operational level.

Improvement in the Kenya NIS has been further facilitated by the existence of a centralised NIS with the MoH acting as secretariat of the NITWG. All data files and reports for nutrition surveys and assessments are submitted to the MoH for storage in a central repository.

Finally, a strong coordination mechanism, inter-sector linkages, mapping of partner capacity, integration within existing systems and regular capacity-strengthening have all been key ingredients of success. Kenya has a functional and vibrant NITWG with clear terms of reference and considerable capacity to offer guidance and support to the NIS. Task forces such as the SMART surveys task force, HMIS taskforce and coverage assessment task force have been formed, taking technical needs and current capacities into consideration. This has increased rigour and enhanced achievement of tasks. Member

focal points who have subject interests/expertise have represented the NITWG in respective sector or intra-sector working groups. This allows the group to be aware of the proceedings of other groups/sectors, to understand information needs and to identify opportunities for integration and resource leverage.

Even with an advanced NIS, there are areas that require improvement. Matters for attention in Kenya include:

- Capacity-strengthening in nutrition IPC, indicator definitions, data triangulation and nutrition information management at county level and qualitative data analysis;
- Continuous data quality improvement;
- Standardising coverage assessment methodologies; and
- Advocacy for data utilisation, evidence-based planning and decision-making.

In conclusion, the Kenya case highlights that the establishment of a functional and sustainable NIS requires strong government leadership and commitment from all stakeholders, building institutional capacities and structures; identification of key facilitating factors/opportunities to leverage; and identification of gaps and areas requiring improvement and the key strategies to address them. A committed team and the structures to follow through recommendations and actions are key. It is hoped that other countries will find this article useful in providing practical measures for setting up a functional information system.

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Al Jazeera

A retrospective qualitative analysis of an infant and young child feeding (IYCF) intervention among refugees in Europe

Summary of MSc thesis¹

By Alexandra Svoboda



Alexandra Svoboda is a student on the MSc Nutrition for Global Health course at the London School of Hygiene and Tropical Medicine (LSHTM). She has five years humanitarian

experience, including working in the Philippines and Nepal alongside an international relief organisation based in Switzerland.

The author acknowledges the support of supervisors Claudine Prudhon, IYCF-E Researcher at Save the Children and Phil James, Research student at LSHTM.

Location: *Greece, Serbia and Croatia*

What we know: The European migrant crisis involved a rapidly transiting, multicultural, multilingual population that challenged the humanitarian response.

What this article adds: A retrospective qualitative analysis was carried out to evaluate Save the Children's infant and young child feeding (IYCF) intervention in Greece, Serbia and Croatia. Fourteen IYCF programme staff were interviewed. Key activities were provision of breastfeeding counselling and support, and targeted provision of breastmilk substitutes to non-breastfed infants. Rapid transit, low contact time, varied IYCF practices and multiple languages greatly complicated response. Untargeted distribution of infant formula and poor provision of complementary foods were common. Supply chain for ready-to-use infant formula took time to establish. Poor IYCF coordination improved with time. Early regional assessment and establishment of IYCF working groups at the outset may have benefited the response.

Background

The European migrant crisis began in 2015 when, exacerbated by the Syrian war, rising numbers of people migrated to the European Union, travelling across the Mediterranean Sea and overland through Southeast Europe. A Save the Children (SC) team arrived in Greece in June 2015 to launch a multisector assessment in response. The initial investigation found no visible signs of malnutrition, such as thinness/wasting or bilateral oedema, in children under two years old arriving on the Greek islands (Save the Children, 2015). However, women reported reducing breastfeeding due to stress and lack of time or privacy. SC also found that non-governmental organisations (NGOs) were freely handing out feeding bottles with mainly powdered infant formula (Save the Children, 2015). These observations prompted a preventative intervention to minimise risks associated with infant and young child feeding (IYCF) practices in migrating populations in Greece, Serbia and Croatia.

Aims and objectives

A retrospective qualitative analysis was carried out to evaluate the SC IYCF in emergencies (IYCF-E) intervention in three countries. It aimed to assess the challenges of responding to IYCF needs in a transiting, multicultural, multilingual population in a high-income European setting. A second objective was to evaluate the SC IYCF-E interventions in Greece, Serbia and Croatia against relevant guidelines and standard operating procedures (UNICEF et al, 2015; IFE Core Group, 2017; WHO, 2004; UNHCR, 2015) to inform future programming in similar contexts.

Methods

This investigation involved interviews with humanitarian aid workers involved in the IYCF response among European refugees in Greece, Croatia and Serbia and an analysis of secondary information, including previous assessments and SC country situation reports. Findings

were interpreted against existing IYCF-E guidelines. The study report was guided by the checklist of Consolidated Criteria for Reporting Qualitative Research (COREQ)².

A total of 31 organisations, including local and national NGOs, volunteer associations and United Nations (UN) agencies operating across the three countries, were invited to participate in interviews; 14 individuals took part in interviews with nutrition and IYCF-E counsellors and advisors, breastfeeding counsellors, field workers and coordinators, and technical advisers. Most were employed by SC (including five from the SC Croatia programme and five from SC Greece), followed by UNICEF (one from UNICEF Croatia and two from UNICEF Serbia) and one independent (with experience of the Greece response).

Results

Key IYCF-E activities

In Greece and Croatia, SC integrated mother-baby areas (MBAs) with an existing child protection programme run by local partners. In faster-paced transit camps in Serbia, SC worked alongside UNICEF in UNICEF-operated 'mother baby corners'. MBAs provided a private place to rest and breastfeed for caregivers with children under two years of age. IYCF-E counsellors were available to speak with caregivers about feeding practices, provide breastfeeding support and counsel caregivers on safe feeding practices and/or relaxation if using infant formula. Kits with infant formula and instructions for its safe use were targeted at mothers who were not breastfeeding, out of sight of breastfeeding mothers. Baby and hygiene kits, including nappies or wipes, were also distributed. A total of 4,091 (Greece), 1,495 (Serbia) and 1,575 (Croatia) children under two years old visited MBAs between August 2015 (when MBAs became oper-

¹ Add reference to MSc report.

² A 32-item checklist for interviews and focus groups originally published by Tong A, Sainsbury A and Craig J in *Int J Qual Health Care*. 2007 Dec;19(6):349-57.

ational) and March 2016 (Save the Children, 2016a-c). In addition, SC undertook advocacy and training sessions for humanitarian and non-humanitarian actors on the importance of IYCF-E and the need for careful, targeted distribution of BMS.

Context and challenges of the IYCF-E interventions

Breastfeeding behaviour

An SC IYCF-E assessment undertaken in February 2016 in Greece revealed that individuals from many different countries were involved in this migration. Among those assessed, women from Syria were less likely to breastfeed compared to those from other countries, such as Afghanistan or Iraq (Prudhon, 2016). The multitude of different feeding practices across many refugee nationalities was a challenge for IYCF counsellors. Some mothers, particularly those from Syria, had never breastfed at all. Other mothers stopped breastfeeding whilst in transit due to the perception that they could no longer produce enough milk. The main reason cited by mothers for cessation was stress, for reasons such as trauma, dehydration, separation from family members, or arduous weather conditions that made breastfeeding outdoors difficult. An emerging theme throughout all country programmes was that ease of access to BMS within camps encouraged women to stop breastfeeding.

Interviewees reported adapting health messages to suit the specific needs and priorities of women in this setting. One breastfeeding counsellor in the Greece programme explained to women the practical benefits of breastfeeding in a way that appealed to them; for example avoiding carrying heavy tins of infant formula and avoiding lost time on the road searching for baby food. Women who had previously breastfed were generally receptive to the concept of relactation counselling, but usually time was lacking to action this in fast-transit countries like Croatia or Serbia.

Breastmilk substitutes (BMS)

Current global operational guidance on IYCF-E (IFE Core Group, 2007) and interim guidance issued for the feeding support of infants and young children in transit during the Europe migrant crisis (UNICEF et al, 2015) recommend no untargeted distribution of BMS, bottles and teats. However, many responders (often volunteers unfamiliar with the humanitarian response) were unaware of these recommendations. This led to large-scale distributions of infant formula within all of the country programmes and challenges with multisector coordination around this. A recurring challenge with the use of powdered infant formula distribution was foreign-language labelling. As a result, mothers were unsure if the infant formula was culturally appropriate (e.g. halal) and were uncertain how to dilute the formula correctly.

To minimise hygiene risks, ready-to-use infant formula (RUIF) was identified by staff as the preferred product for mothers unable or unwilling to breastfeed. However, interviewees reported that RUIF was not available in the early stages of the emergency response. This compromised messaging to organisations to avoid distribution of powdered formula when no better alternative was available. Also, it was not known how long

the migration period would last, which made estimating RUIF needs very difficult.

Complementary feeding

Interviews revealed the lack of a coordinated response on complementary feeding. Refugees received food from volunteers or NGOs for infants under two years of age in camps and transit locations; however most of these independent distributions were undertaken without the use of selection criteria. Interviewees reported the dissatisfaction of caregivers with the unaccustomed complementary foods provided. Interviewees across the different countries reported that co-ordination between agencies on complementary feeding was absent.

Water, sanitation and hygiene

There was general agreement among interviewees that feeding bottles used by mothers and caregivers were below minimum hygiene standards in all countries. There was a lack of facilities to clean bottles, both on the road and in transit camps, in all three countries. Most IYCF-E staff explained to caregivers how to initiate cup feeding if the concept was new to them; however interviewees reported that many caregivers did not feel that they had the time required to cup feed if they had to move on quickly. Exchanging new bottles for old was not mentioned by staff in the interviews.

Programme implementation

The most difficult aspect of this humanitarian intervention cited by interviewees was a lack of contact time with mothers, further complicated by unknown refugee arrivals and departures. Insufficient availability of interpreters, especially females in a gender-sensitive sector such as IYCF, was also a challenge. Referral systems with the child protection group were in place, as well as cooperation to send ill children to medical NGOs. However, there was a lack of coordination by nutrition agencies with water, sanitation and hygiene (WASH) sector staff from other organisations; a critical gap given the hygiene issues around feeding.

Coordination

In a refugee crisis such as this, UNHCR implements the Refugee Coordination Model (RCM) to coordinate the response for all actors from UN and non-UN agencies (UNHCR, 2016). However, feedback suggests a lack of global coordination in this emergency, particularly in the handling of donations of BMS at the beginning of the crisis. The unpredictability of the movements and numbers of refugees seems to have been an important constraint on creating an efficient coordination system. However, interviewees did report that, regarding IYCF, coordination became much better with time; for example, after an IYCF working group was established in January 2016 in Greece by SC, and subsequently in Croatia and Serbia, with ongoing advice and support from UNHCR.

Conclusions and recommendations

The fluctuating presence of volunteer associations and the high turnover of staff from other organisations meant that maintaining IYCF awareness in all three country programmes was a challenge. Establishing an IYCF working group earlier on in

the crisis and improving coordination and communication to uphold best practice might have helped prevent some of the issues around BMS management and enabled a much stronger, sensitive response regarding complementary feeding.

In a context such as this (bottle feeding, rapid transit, low contact time), it may be more realistic to make clean bottles readily available for mothers who are unwilling or unable to breastfeed, rather than relying solely on the promotion of cup feeding, which mothers were reluctant to uptake. The lack of sanitation facilities greatly compromised feeding with infant formula; the health impact of feeding infants with unhygienic bottles in this setting is unknown. Establishing advance procurement agreements with international RUIF suppliers may help organisations cope more quickly with a first wave of supplies in this kind of response.

With varying nationalities came multiple languages and cultural backgrounds. Leaflets and flyers with pictures were often available to assist in introducing important messages. A short training for key aid workers to learn essential phrases in different languages could facilitate better relationships with anxious mothers and lead to better uptake of positive health messages.

The response would have benefited from an earlier regional IYCF-E assessment to aid the co-ordination of refugees migrating between countries. Country assessments were undertaken in Greece and Croatia in June to July 2015; however no regional assessment was undertaken. An early cross-country tracking system for vulnerable beneficiaries could have helped cooperating partners in onward transit locations to follow up on support. Taking advantage of the high use of mobile phones among the refugee population might be an area to explore further for this purpose.

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References

- Prudhon, C. *Assessment of infant and young child feeding practices among refugees on Lesvos Island, Greece*. London, UK: Save the Children; 2016.
- IFE Core Group (2017). *Operational guidance on infant and young child feeding in emergencies*, v 2.1.
- Save the Children. *Multi-sector needs assessment of migrants and refugees in Greece*. Athens, Lesvos, Chios, Kos July 5-18 2015. London, UK: Save the Children 2015.
- UNICEF, UNHCR, Save the Children, ENN and reviewers (2015). *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*.
- Save the Children (2016a). *Situation Report Serbia March 2016*. London, UK: Save the Children, 2016.
- Save the Children (2016b). *Situation Report Croatia March 2016*. London, UK: Save the Children, 2016.
- Save the Children (2016c). *Situation Report Greece March 2016*. London, UK: Save the Children, 2016.
- UNHCR (2016) United Nations High Commissioner for Refugees. Refugee Coordination Model (RCM). Geneva, Switzerland: United Nations High Commissioner for Refugees; 2016.
- UNHCR (2015) *Infant and young child feeding practices Standard Operating Procedures for the Handling of Breastmilk Substitutes (BMS) in Refugee Situations for children 0-23 months, August 2015* (version 1.1).
- WHO (2004) *Guiding principles for feeding infants and young children during emergencies*.

SAM patient in the TFC, Aden, Yemen

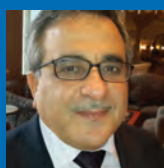


Building capacity in inpatient treatment of severe acute malnutrition in Yemen

By Fekri Dureab, Dr Ayoub Al Jawaldeh and Dr Latifah Abbas



Fekri Dureab MD was the head of the nutrition department at WHO Yemen office until June 2016; currently he is a PhD Student at Heidelberg University, Germany.



Dr Ayoub Al Jawaldeh is a Nutrition Regional Advisor at the World Health Organization (WHO) in EMRO, Cairo.



Latifah Abbas MD is a Nutrition Officer at the WHO in Aden, Yemen.

The authors would like to express their gratitude to all staff of the Therapeutic Feeding Centre in Al-Sadakah Teaching Hospital in Aden, as well as the World Health Organization Yemen office, which gave them the opportunity to carry out this project in Yemen.

Location: Yemen

What we know: Complicated cases of severe acute malnutrition (SAM) have a high mortality risk and require competent inpatient care.

What this article adds: WHO conducted a study to explore the impact of a programme of in-service training and systems support on the inpatient care of malnourished children in Al-Sadakah Hospital, Aden Governorate, Yemen from 2010 to 2013. Support included six-day training courses of health professionals, training of hospital physicians as trainers, refresher training, continuous on-the-job training, basic training for all hospital health workers, awareness-raising of non-clinical staff, and monitoring. Problems with therapeutic food and medicine supplies and staff incentives were resolved. Outpatient treatment services were expanded with UNICEF and WFP support in 2013. Inpatient mortality rates fell (from 8.3% in 2010 to 4.5% in 2013) and recovery improved, but the defaulter rate increased (from 15.5% in 2011 to 21.3% in 2013) due to challenges in accessing the service. One quarter of admissions were under six months of age; half were under one year old. WHO continues support to sustain the service in the current humanitarian crisis, with increasing admissions. Staff turnover remains a critical challenge to sustaining quality of care.

Context

Acute malnutrition threatens the survival of children both in emergency and non-emergency contexts and is responsible for around 45% of all child deaths worldwide (WHO, 2016). Globally, severe acute malnutrition (SAM) affects between 19 and 26 million children under five years of age and contributes to nearly one million child deaths each year (UNICEF, 2013). A child who is severely under-weight is 9.5 times more likely to die of diarrhoea than a child who is not. Reduction of under-five mortality cannot be achieved unless action is taken to treat and prevent acute malnutrition (WHO, 2011; UNICEF, 2013a; Generation Nutrition, 2014).

Yemen is currently facing a major humanitarian crisis; the current conflict has been preceded by four years of civil unrest, against a backdrop of chronic poverty. The March 2017 Integrated Food Security Phase Classification (IPC) reports that an estimated 17 million Yemeni people (60% of the population) are food-insecure, including 6.8 million who are severely food-insecure and who require urgent humanitarian assistance to save lives and protect livelihoods (UNICEF, 2017). According to health cluster analysis, the main causes of avoidable deaths in Yemen are communicable diseases, maternal, perinatal and nutritional conditions (together accounting for 50% of mortality) and non-communicable diseases (39% of mortality). There have been 18,848 suspected cholera cases since October 2016. An estimated 14.8 million people lack access to basic healthcare, including 8.8 million living in severely underserved areas (WHO, 2017).

Acute malnutrition treatment in the current crisis in Yemen is influenced by

existing service capacity. From 2010 onwards, a World Health Organization (WHO)-led programme sought to improve the quality of inpatient SAM treatment in Al-Sadakah Hospital in the Aden Governorate of Yemen. WHO conducted a study to explore the impact of improving the environment and capacities of the therapeutic feeding centre (TFC) on the inpatient care of malnourished children in Al-Sadakah Hospital during the period 2010 to 2013. The main findings and reflections are shared in this article.

Improving acute malnutrition treatment services

Al-Sadakah TFC or nutrition unit is a major centre for the treatment of SAM cases coming mostly from Aden Governorate and other nearby Governorates (Lahj, Ad Dhala'a, Shabwah and Abyan). It is located at the Al-Sadakah teaching hospital in Aden and began operating in July 2006. At the outset, the TFC faced many difficulties that negatively impacted on its performance, including resistance of paediatricians to SAM management protocols, low number of beds, staff shortages, lack of drug supplies and other materials, and transport problems that hindered the supply of therapeutic milks and foods. To address these issues, a period of raising awareness of the problem with hospital management was followed by a three-year programme of capacity-building within the TFC and wider hospital.

From 2011 to 2013, six training courses on SAM management were carried out for doctors, nurses, medical students and health workers across the hospital, supported by WHO and UNICEF. Each course lasted for six days and used WHO training materials on the inpatient care of SAM with complica-

Figure 1 Number of SAM cases admitted to the TFC from 2010 to 2013

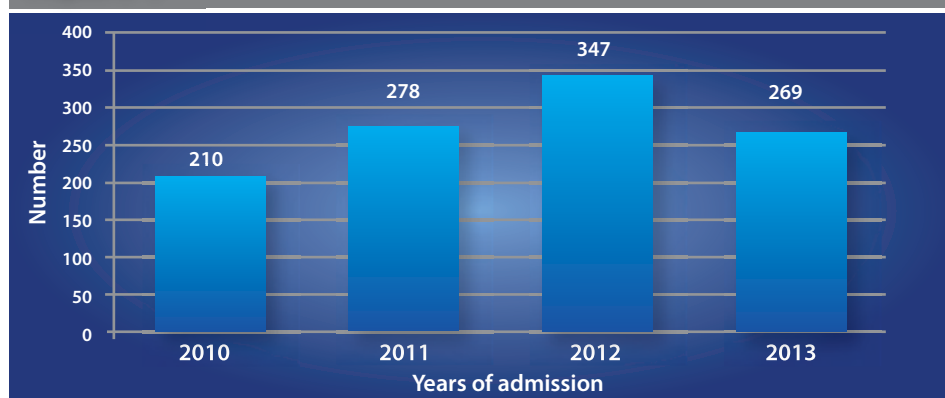
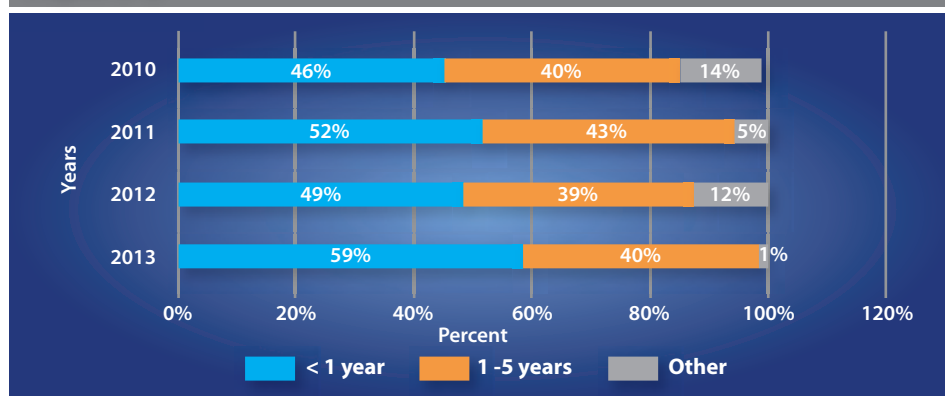


Figure 2 Distribution of SAM cases admitted to the TFC by age



tions. Adapted materials were used for distinct staff cadres. Most health workers in the hospital were trained in some level of SAM management so that early management could begin even before transfer to the TFC. Hospital administrative staff were targeted with short awareness sessions on malnutrition and the importance of the nutrition unit. National and international WHO nutrition experts conducted training of trainers (TOT) with hospital physicians. Initial training courses were followed up with annual refresher courses and continuous on-the-job training by the expert physician in the centre. This effort was supported by continuous quality checks by hospital management, with support from the Ministry of Health (MoH) and WHO, and included the use of a monthly monitoring and evaluation sheet by staff.

In July 2009, an outpatient therapeutic programme (OTP) was established in the community with support from UNICEF to deal with uncomplicated SAM cases and to receive referrals

of stabilised cases from Al-Sadakah TFC. A further five new OTPs were opened in the surrounding Governorates during 2013 with UNICEF support. In 2013, a supplementary feeding programme (SFP) was added to the nutrition service to manage cases of moderate acute malnutrition (MAM) in the community and receive referred cases from the OTP. In 2011, the TFC/nutrition unit was improved to include 21 beds, a training room, a maternal education and counselling corner, a child development and play corner, and a critical care unit. Therapeutic milks and foods (F75, F100 and ready-to-use therapeutic food (RUTF)) were provided by the MoH with support from UNICEF and WHO. The SFP is supported by WFP with the provision of ready-to-use supplementary food (RUSF). Supply problems of therapeutic milks and RUTF were also resolved; from 2012, the Nutrition Cluster and UNICEF took on the responsibility of transporting goods to the warehouse of each Governorate. Support from WHO

also continued over the period and included provision of medicines, equipment, maintenance and staff incentives for night shifts.

Review 2010-2013

To examine the impact of these improvements on the TFC performance, researchers analysed data from annual reports of the Al-Sadakah TFC between 2010 and 2013. All children of both sexes admitted to the nutrition unit diagnosed with SAM and with available records were included in each annual report. Diagnosis of SAM was based on weight-for-height z-scores (WHZ) or presence of bilateral oedema, according to the recommended WHO classification (WHO, 2013).

The number of SAM cases admitted to the TFC increased gradually from 210 in 2010 to a peak of 346 in 2012, then decreased again to 269 in 2013 (see Figure 1). The peak admission in 2012 coincided with a period of armed conflict in Abyan Governorate. The fall in admission rates in 2013 likely reflects the expansion in community treatment services (OTP) in the surrounding governorates, which relieved pressure on the TFC.

Figure 2 shows the distribution of SAM admissions by age. More than half of the admitted cases between 2011 to 2013 were infants (under one year of age); around half of these were under six months of age.

Patients admitted to the TFC were usually complicated cases and were sometimes admitted in the late stages of SAM, particularly those coming from distant areas. Some admissions re-mained in the TFC until fully recovered; this proportion increased from 2.9% in 2011 to 17.5% in 2013. These cases were mostly under six months of age and were required by WHO protocol to remain in the unit until fully recovered. After recovery, these patients were transferred to the infant and young child feeding (IYCF) corner for counselling before discharge. The proportion of inpatients successfully treated (recovered cases plus those transferred to OTP) increased after the programme of improvements began (from 68% in 2010 to 79% in 2011), then fell again (from 77% in 2012 to 73% in 2013). This can be explained by the in-crease in defaulter rates from 2011 (15%) to 2012 (17%) and 2013 (22%) (Table 1). There was no system to follow up defaulters to explain why this figure increased; however the main suspected reasons for defaulting were socioeconomic pressures and the need to care for other children at home.

The mortality rate decreased from 8.1% in 2010 to 4.3% in 2012 and 4.5% in 2013 (Table 1).

Discussion and conclusions

Variation in admission rates over the three-year period likely reflect changes in risk of acute malnutrition in the population due to conflict, as well as the increase in access to more community-based care options from 2013. The fall in mortality rates among TFC admissions to less than 5% by 2013, and increase in recovery rates and transfers to OTP, are likely due to the improved

Table 1 Performance indicators for the TFC 2010 to 2013

	No. of admissions	Recovered		Death		Non-response		Medical Transfer		Transfer to OTP		Defaulter	
		N	%	N	%	N	%	N	%	N	%	N	%
2010	210	10	4.80%	17	8.10%	7	3%	6	3%	133	63%	36	17%
2011	278	8	2.90%	15	5.40%	0	0%	1	0%	211	76%	43	15%
2012	346	13	3.80%	15	4.30%	1	0%	1	0%	253	73%	59	17%
2013	269	47	17.50%	12	4.50%	1	0%	2	1%	149	55%	58	22%
Total	1103	78	7.10%	60	5.40%	9	1%	10	1%	746	68%	196	18%

quality of care for children with SAM, brought about by the training programme with consequent adherence to SAM management protocols and access to community-based management. Training continues to the present day and involves courses for new staff and refresher training for old staff, as well as special courses for academic staff to integrate the management of malnutrition into the medical curriculum to ensure sustainability through effective pre-service education.

Data show a high proportion of young infants were admitted to the TFC with SAM. SAM in infants is a chronic problem; admissions occur in stable times but increase during conflict periods. Diarrhoea and respiratory infection are common in this age group. Anecdotally, most infants under six months of age admitted to the TFC were mixed-fed, usually using infant formula in addition to breastmilk. This feeding pattern concurs with prevalent feeding practices in the community, where exclusive breastfeeding rates are low (10%) and bottle-feeding common (44%) (MoPHP and CSO, 2013). Most of the admitted cases came from poor areas with sub-optimal household hygienic conditions. At home, infant formula is purchased from the local market, costing 2,000–5,000 Yrs monthly. Most of the mothers presenting with young malnourished infants are stressed for many reasons, including the conflict, poverty and concerns about meeting daily food needs; this has not been examined in detail within the programme. Diluted F100 and breastfeeding support are used as part of the treatment protocol for SAM cases under six months old. However,

in the hospital, more generally, IYCF support services are limited. While WHO with the MoH have adopted a national guideline on the International Code for Marketing of Breastmilk Substitutes, implementation has been delayed due to insecurity related to conflict. Thus it is likely that many factors, including prevalent feeding practices, infectious disease, maternal wellbeing and household factors contributed to the high proportion of SAM admissions in this age group; an observation shared by others (Islam, 2017).

Community participation and access to community services has an important impact on health. The development of community-based services for uncomplicated SAM cases and for MAM relieved pressure on the inpatient service. Development of all CMAM components is very necessary; aspects of community outreach and follow-up need strengthening in the current situation in Yemen to further improve recovery rates.

An increasing number of cases is being admitted to the TFC in the current humanitarian situation, particularly due to the flow of internally displaced people from Taiz Governorate; the TFC is working at full capacity. The programme to build capacity of inpatient treatment of SAM has been a worthwhile investment and has helped prepare for the current crisis. One of the biggest challenges continues to be staff turnover and the need for continuous training of new staff to sustain good quality of services. WHO continues to support the TFC with training and running costs in order to maintain its vital function at this critical time in Yemen.

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References

- Generation Nutrition (2014). *Acute Malnutrition: An Every Day Emergency, 10 Points Plan for Tackling Acute Malnutrition in Under-Fives*. 2014.
- Islam M et al. *Risk factors for severe acute malnutrition in infants <6 months old in semi-urban Bangladesh: A prospective cohort study to inform future assessment/treatment tools*. Nutrition Exchange, 2017(54): p. 62.
- MoPHP and CSO (2013). Ministry of Public Health and Population and Central Statistical Organization (CSO) Yemen. Yemen National Health and Demographic Survey 2013.
- http://documents.wfp.org/stellent/groups/public/documents/ep/wfp290997.pdf?_ga=1.211132821.1824505796.1493114735
- WHO (2011). World Health Organization (ed) Guideline Management of Severe Acute Malnutrition In-Patient Care. 2011.
- WHO (2013) World Health Organization Guideline: Updates on the management of severe acute malnutrition in infants and children. 2013, World Health Organization: Geneva.
- WHO (2016). World Health Organization Children: Reducing mortality Factsheet 2017. www.who.int/mediacentre/factsheets/fs178/en/.
- WHO (2017). World Health Organization Yemen Humanitarian Response Plan. 2017 www.who.int/emergencies/response-plans/2017/yemen/en/WHO
- UNICEF (2013). Evaluation of Community Management of Acute Malnutrition (CMAM) Global Synthesis Report. 2013.
- UNICEF (2013a). Improving child nutrition: The achievable imperative for global progress. April 2013.
- UNICEF (2017). Yemen Nutrition Cluster Bulletin. Jan-March 2017, Issue 1.

Evaluation of the response to Hurricane Matthew, Haiti

Summary of research¹

On 3 and 4 October 2016, Hurricane Matthew struck southwest Haiti, affecting an estimated 2.1 million people; the first major disaster since the May 2016 World Humanitarian Summit (WHS) in Istanbul. A real-time evaluation (RTE) was undertaken to determine if the response lived up to the commitments made at the WHS, especially those laid down in the 'Grand Bargain' agreement between donor governments and agencies. Two

independent experts visited Haiti in weeks six and seven of the response to assess if the international response was effective, efficient, relevant and timely and how it reflected the Grand Bargain commitments². The following provides a summary of findings in the RTE report.

The overall finding is that there has been significant, albeit uneven, improvement in the international humanitarian response to Hurricane

Matthew compared to earlier disasters in Haiti, with major differences in the understanding of the scale and complexity of the disaster among

¹ Grünwald F and Schenkenberg E. (2017). Real time evaluation: response to hurricane Matthew Haiti, November–December 2016. CCIC, CCO, CLIO, DfID, IFRC, OFDA/USAID, SDC, United Nations. <http://www.alnap.org/pool/files/report-rte-haiti-compressed.pdf>

² http://reliefweb.int/sites/reliefweb.int/files/resources/Grand_Bargain_final_22_May_FINAL-2.pdf



donors and operational humanitarian agencies, who responded at different speeds and with different levels of investment from headquarters. The efforts made in disaster preparedness and resilience-building since the 2010 earthquake have largely paid off; prepositioned stocks and trained staff facilitated a rapid start to the response, even before communication with the affected area was re-established. National leadership and coordination under the Haitian Civil Protection Agency was rapidly put in place, albeit constrained by the absence of a national disaster law. Despite a strong United Nations Disaster Assessment and Coordination (UNDAC) presence during the initial phase, it took some time for effective system-wide coordination to be put in place and for the Office for the Coordination of Humanitarian Affairs (OCHA) to step up its role and capacity.

At the time of the RTE, there was still no consolidated picture of where the most urgent needs lay or of who had received assistance. Some sectors were performing better than others; affected communities had received water, sanitation and hygiene (WASH) services in particular; however urgent shelter needs were still not being met. There were also problems coping with increased food insecurity; by weeks six to seven of the response, significant parts of the highly affected areas had still not been reached with food, largely due to logistical and security constraints and insufficient implementation capacity on the ground. This raises the dilemma of doing the right things (ensuring access to any kind of food) or doing things right (only distributing a comprehensive, balanced food ration). In tropical rural areas, where food rations would be temporary and where wild food and leaves would provide part of the micronutrient ration, distributing an unbalanced food aid ration quickly to as many families as possible is better than waiting to distribute a balanced ration.

Key findings according to the relevant Grand Bargain commitments are:

More support to local and national responders: The Haitian authorities have taken the lead in

managing and coordinating the response to Hurricane Matthew and international actors have given them space to do so. However, United Nations (UN) and international agencies need to provide more coordination, guidance and take initiatives in consultation with the authorities.

Increase the use and coordination of cash-based programming: In Haiti, the World Food Programme (WFP) was quick to assert a leading role in the coordination of cash. However, as cash should be used for all relevant sectors and not only for food, intense negotiations resulted in the creation of a workable, OCHA-led cash coordination mechanism.

Improved joint and impartial needs assessments: The collection of data and the coordination of needs assessments and analysis could have been better managed and coordinated. Early in the response, certain data (especially mortality figures) became a politically charged issue, exacerbated by competition for limited funds. OCHA's initial weaknesses resulted in many shortcomings in terms of data management; this has improved significantly with OCHA's increased capacity.

The participation revolution: The Grand Bargain stresses the need for affected people and communities to be included in decision-making that affects their lives and for agencies to share relevant information about their plans and activities with them. The response in Haiti shows that many of the commitments in this area are not yet taken sufficiently seriously and the level of participation depends very much on the agency.

Enhance the engagement between humanitarian and development actors: In Haiti, the linking of humanitarian plans and development strategies is a daunting task not only because of the political context, but also because of the plethora of plans and strategies that have been developed. One major drawback is that several major donors were in the process of leaving Haiti before Hurricane Matthew and it remains unclear what affect this will have on the availability of multi-year humanitarian and recovery funds.

Key recommendations are:

Adjustments to be made to the current response

1. Develop a consolidated overview of areas not yet reached by aid;
2. Accelerate the process of supporting food security;
3. Ensure that displacement in evacuation centres does not become prolonged and accelerate the delivery of proper assistance and protection for those who return to their areas of origin;
4. Continue efforts to overcome the bottlenecks in the delivery of aid;
5. Improve the shelter situation;
6. Step up coordinated inter-sector and integrated responses, especially for areas that have not yet received assistance;
7. Facilitate a gradual transition to cash-based solutions;
8. Further improve communications with affected populations to ensure better acceptance and improve security;
9. Increase access of national and local NGOs to financial resources and capacity-strengthening support.

Key recommendations for the longer term

10. Ensure that the adoption of a national disaster law is a key priority of the government in order to set out roles and responsibilities in the management of preparedness and disaster response and make provision to facilitate appropriate investment in recovery, preparedness and longer-term, risk-informed development;
11. Improve the disaster information management system;
12. Make communication systems resilient;
13. Develop pre-disaster arrangements with the private sector to ensure that sufficient equipment for road clearing is in place at the commune and departmental levels.

Key recommendations for the humanitarian sector

14. Strengthen the capacity of OCHA in fragile states and at-risk countries;
15. Establish proper dialogue with regard to assessing the gravity of a situation and agency mobilisation;
16. Strategically use opportunities offered by remote-sensing and crowd-sourcing technologies;
17. In contexts where clusters are not activated, UN and international agencies must realise that they have a responsibility in coordination, in particular in actively supporting government coordination capacities;
18. Identify a way or mechanism that can make humanitarian and development funding instruments better articulated and able to address key humanitarian and recovery needs more quickly.

Key recommendations in the context of the Grand Bargain

19. Continue to use the Grand Bargain as a basis for a two-way dialogue between donors and operational agencies;
20. Insert a level of realism and honesty in working together.



Groupe URD / HERE Geneva, Haiti

Agency profile

Taking a MUAC measurement, Imvepi Refugee Settlement, Uganda

VALID

Name:	Valid International
Address:	35 Leopold Street, Oxford, UK, OX4 1TW
Email:	office@validinternational.org
Website:	http://www.validinternational.org/
Year founded:	1999
Director/CEO:	Steve Collins
No. of HQ staff:	10
No. of staff worldwide:	12

Valid International

In late June this year, ENN interviewed Kate Sadler, Director of Programmes at Valid International (VI), and followed up by speaking to Steve Collins, one of the founders of VI and still at the helm. Kate is an old hand herself, having first joined VI as a nutrition advisor in 2001 (after meeting Steve at a UNICEF meeting in Ethiopia). She spent six years working on Community Therapeutic Care (CTC)/Community-based Management of Acute Malnutrition (CMAM), during which she completed her doctorate. After a five-year break in the US (as Assistant Professor of Nutrition at the Feinstein International Center (FIC), Tufts University), she returned as Programmes Director, and now oversees all projects and programmes as well as supporting the strategic direction of the organisation.

We began by revisiting the profile ENN did on Valid back in 2006, when Steve Collins and VI co-founder Alistair Hallam were interviewed. Steve had described how he wanted to keep the Valid 'vibe' fairly informal. Kate laughed and said that the informal vibe is still there, although they have "brought in a few structures and systems" to professionalise since then. Ever the visionaries, Steve and Al also saw "the potential for more experienced staff to 'bud off' and form groups which they manage more autonomously." Twelve years on has seen the creation of Valid Nutrition (VN)¹, which is focused

on the food product area, and Valid Evaluations (VE)², the most recent offshoot led by Alistair Hallam. Before we went any further, Kate explained the differences. They are all separate entities: VI is a social for-profit enterprise based in the UK; VN is an Irish-registered charity; and VE is a separate, UK-based entity.

VN's research centres on the local production of ready-to-use food (RUF), such as the use of locally sourced ingredients and the impact this can have on food security and lowering costs. VI and VN have a good, collaborative arrangement, sometimes sharing "people resources", while VN sometimes draws on VI research capacity. They submit joint proposals where there is common ground, such as testing the efficacy of novel, lower-cost product formulations made from locally grown ingredients and their impact on severe acute malnutrition (SAM) treatment and prevention. VE expertise lies in assessment and (as the name suggests) evaluations. This complements VI's work, which involves primary research and innovations around indicators and methodologies (a significant workstream within VI called Measures), and again VI and VE work very collaboratively here.

So, who is at the helm these days? Steve is at the managerial apex as sole director and works from home in West Cork, Ireland. A team of ten core contracted staff covers administration, finance, programme management and technical

research, enabling the Measures work programme. Most of the team are based in the Oxford office. VI also draws on a pool of consultants worldwide to deliver projects, including six core consultants (associates) who regularly work with VI and help leverage work at country level³.

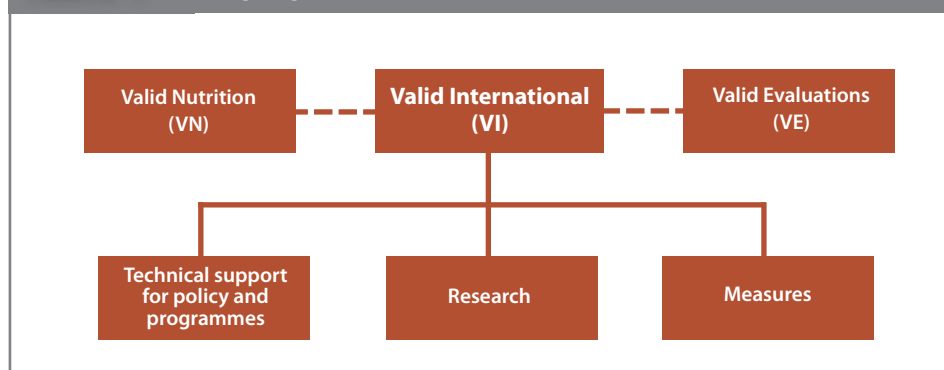
I asked Kate what was different about Valid now compared to 11 years ago, when we last ran their profile in Field Exchange. She explained that, back then, community therapeutic care (CTC), the precursor to the community-based management of acute malnutrition (CMAM) approach, was the sole focus of VI – implementing research and providing technical support to implementers or governments to pilot and subsequently scale up CTC/CMAM. As this evolved, various offshoots of work developed, such as exploring how the approach fits with food-by-prescription services for HIV and what makes a programme successful from a community perspective. As CMAM became more accepted and mainstream as an approach and its capacity to deliver was strengthened, the demand for this type of technical support began to reduce. Increasingly, requests came in to help agencies evaluate what they were doing and to measure aspects like coverage.

¹ Jeremy Shoham (2004). Valid International Ltd. Field Exchange 23, November 2004. p22.
www.ennonline.net/fex/23/agencyprofile

² <http://www.validevaluations.org>

³ Kenya, Malawi, Ethiopia, DRC.

Table 1 Valid organogram



“As part of CTC’s research and development we realised we needed to better assess the population-level impact of programmes. There was a particular gap in understanding how well programmes were doing in reaching the whole of an affected population – we were able to assess numbers treated and recovered, but traditional tools couldn’t give a direct estimate of programme reach or coverage.”

That question led to VI’s collaboration with Mark Myatt at Brixton Health and the start of the development of assessment methods that could better assess coverage of and access to selective feeding programmes. This became a growth area for VI and now forms a big stream of work under the Valid Measures team. The work focuses on the development of more efficient and effective assessment methodologies to assess coverage and meet the assessment needs of many different types of intervention around child survival and prevention actions. For example, VI has recently been examining coverage of urban water, sanitation and hygiene (WASH) programmes in Bangladesh and regularly applies new methods to aid rapid assessment in different sectors, as well as monitoring and impact evaluation.

In their work around surveys and assessment, VI works with and draws on methods from many other sectors. Kate explained that VI is engaged in four main elements. First, the metrics; i.e. what and how to measure, indicator development and sample design. This work has included development and testing of easy-to-use infant and young child feeding (IYCF) indicators, work on more complex, composite-type indicators to measure poverty and resilience, and the application of spatial sampling techniques to improve usability of assessment outputs. The second area is the analytics; i.e. how to analyse the data, statistical algorithms and methods. VI is continually trying to adapt and improve survey methods and make them more cost-effective. Much of this is about reducing sample sizes, drawing from statistical methods (such as PROBIT and ‘bootstrapping’) applied in

other sectors. The VI approach is driven by generating information that is useful for programme and policy decision-making. To achieve this, surveys need to be more localised, with indicators mapped to the district level; this is where spatial sampling comes into its own. The third area, training, supports workshops, field training, manuals and online courses to help partner organisations build capacity in the area of assessment. The fourth area, technology, supports the systems and platforms for data capture and processing.

I asked Kate what common challenges they come across in evaluations. She was quick to pinpoint the need for agencies to be able to identify causality:

“Nutrition is so multifaceted – it is very difficult to figure out whether an intervention has caused any change or not. Everyone has ‘theories of change’ these days, but it’s hard to design assessments that are able to cope with the realities of programming in country contexts and also deal with the issue of attribution. At one end we have good academic studies, while at the other end we deal with the more anecdotal perspective of implementers.”

Kate described how VI is often asked to design a baseline and endline study with no consideration of capturing what happens in between: “What we should be doing is identifying the changes along the way and figuring out how we measure as we go along to inform programming at the time”. Indicators are frequently a challenge, often measured in different ways and quite sector-specific. Also, standard indicators aren’t necessarily the most useful, context-specific indicators. VI is sometimes brought in at the design phase to decide on the most relevant indicators; this in turn can generate more questions (and work). Whether to use mid-upper arm circumference (MUAC), for example, came up as a recent question for work in India. In this instance, VI helped make the case for including it in assessments. Kate also pointed out that assessments have not kept up with the demands of multi-sector programming

and that agencies are struggling with how to bring it all together. VI is increasingly asked to help with this challenge.

So, who funds VI? It is typically contracted by United Nations (UN) agencies and non-governmental organisations (NGOs) on specific pieces of work, sometimes responding to grant calls as part of consortia and often “partnering with like-minded agencies that provide a platform to allow us to do what we want to do”. VI is not directly contracted by government, but often works with it. There is usually some capacity-building component; for example, data collection teams often come from the national statistics bureaus. Currently VI is undertaking research in Ethiopia in partnership with government, which was a requirement of the funder (the Bill & Melinda Gates Foundation).

Back in the early days of VI, generating evidence was critical to CTC/CMAM success and operational research remains central to VI. This workstream is overseen by Paluku Bahwere, the VI research lead. Kate mentioned a key piece of work VI is currently involved with: a Gates-funded project to look at the implications of changing the MUAC admission cut-off to the new World Health Organization (WHO) recommendation in terms of impact on CMAM programmes and cost-effectiveness. Also in Ethiopia, VI has led the design, implementation and data analysis for the impact evaluation of the ENGINE project⁴, as well as two other research studies. One is looking at nutrition and health-related outcomes of children treated for SAM in a community-based programme in Jimma, Ethiopia; the other is a prospective cohort study from a food-secure setting in rural Ethiopia on the treatment of moderate acute malnutrition (MAM) in children, summarised in Field Exchange 54⁵.

As some of our readers may remember, the early days of CTC/CMAM were steeped in debate, conflict and controversy, with opponents of this new, community-based approach arguing that it would contribute to child deaths. VI’s commitment to generating evidence therefore had to be strong and steady. I was keen to know what Kate saw as the next big question for the organisation. She responded by saying that the team has developed ideas around the prevention of stunting through market-based interventions, including targeting consumers with low-cost, highly fortified supplements. “Many are talking about harnessing the power of the market to address undernutrition”, she explained, “but the question is, will a market-based intervention work and what kind of impacts on nutrition to expect?” In order to answer this critical question, VI is proposing and currently seeking funding for a five-year research programme.

⁴ A multi-sector project that covered 116 woredas (districts) and aimed to support policy and practice for prevention of undernutrition during the first 1,000 days of life.

⁵ <http://www.enonline.net/fex/54/mamnosupplfed>

Asked what makes VI unique in its assessment and survey work, Kate checked with her colleague, Ernest Guevarra, who leads the Valid Measures stream of work, for his insights, given his on-the-ground experiences of assessment. He reflected on the niche that VI occupies:

“We occupy a space between those organisations implementing more standard assessments (they have nutrition/health sectoral expertise but not the stats/spatial epi/technology to do the assessment/indicator design or innovation) and big developers such as Nielsen, who focus uniquely on development of new surveys – they have the stats/spatial epi/technology to do assessment/indicator design and innovation but not the sectoral expertise. VI has high-level expertise in health/nutrition as well as the technical know-how to develop assessment methods/indicators to address very specific sectoral needs. This places us in a unique position to support understanding of assessment needs and the skill set to meet these needs in the most efficient and useful way possible.”

Having finally managed to track Steve Collins down at an airport as he transited to a flight to Myanmar, I asked him the ‘big’ question: “What is your vision for the future of VI?” He was pretty clear on this: “The drive to generate quality data to provide evidence on what we all

do, and hold ourselves to account, remains the over-riding guiding principle of VI’s work. VI looks to push the boundaries of what we can do.” He pointed out that the fact that the core team – Kate, Paluku, Ernest and others – has been with VI from the early days has meant it has remained true to this core principle while broadening technical horizons.

I asked Steve what the main challenges over the last ten years have been for them. One has been the transition from being a “small band of rebels” promoting an alternative approach to an expert group in what became a mainstream technique; VI had to work on changing people’s understanding of what VI was about. It has also had to up its game in what Steve described as “customer service”. In the old days, work came to VI and it was very much focused on doing the heavy lifting on the ground. Now they undertake work with clients where there is much more emphasis on communication and a professionalisation of this interface. He went on to say how communication within VI among the staff, as well as externally, has become even more critical as they have expanded (and sometimes contracted).

Another interesting challenge has been around intellectual property. VI has always had an open-door policy when it comes to sharing developments. “We made early RUTF [ready-to-use therapeutic food] patents freely available, we trained people up to do CTC [community-therapeutic care] (and did ourselves out of a job in doing so), we developed methods like CSAS and SQUEAC and trained users”. However, as VI developments were taken on board by agencies, VI often got cut out. Steve

reflected that “if you give away intellectual property, it is very difficult to have a viable business model”. Today VI is happy to pass on expertise and knowledge around all its assessment work, but tries to do so through structured partnerships with agencies. Another challenge, common with small organisations, is managing the capacity to deliver with the jobs on hand (supply and demand). It is quite a balancing act. In the early days, when CTC/CMAM work was going strong, VI had people on long-term contracts. Nowadays, shorter-terms contracts are the norm.

I asked Steve about how the developments of VN and VE sat with his original vision. He reminded me how, in the original CTC model, local production and delivery of RUTF was “one of the circles” and a fundamental part of the approach. To develop this strand of work, it made great sense for VN to form and focus on the “route to market in more depth”, with VI remaining focused on the research/technical aspects. Similarly, VI was increasingly undertaking evaluations and it made good sense for more formal/commissioned evaluations to branch off as a separate entity. As Kate reflected, there is strong collaboration between the Valid offshoots; Steve sits on the board of VN and so is involved at a strategic level, rather than day-to-day. Similarly, his role in VI is much more hands-off and “peripheral” than in the first flush of VI, an evolution which has been a conscious decision on his part. He described how “nutrition is plagued by old experts who are often conservative and don’t run with the times”. He is no longer on the ground like he used to be, aside from a few “pet projects” such as his work with government in India. “The vitality and responsiveness to issues need to be directed by people on the ground doing the work”; he is no longer there, but the VI team is – a group of individuals in whom he has the utmost faith to drive VI forward. He sees this “transfer of power to ground level” as critical to maintaining VI’s relevance.

Steve concluded, “In a nutshell, we are about evidence-based development and relief. We need accountability of the system – do we have effective impact? There are only limited pots of money available. We need to make what we have got work”.

ENN’s office is next door to VI in Oxford and I should confess that I have only had a limited knowledge of the rich web of cohesive work VI continues to spearhead, in our sector and in others. As ever with success stories, the individuals involved ‘make or break’ small organisations and it is clear that the longstanding commitment of many individuals at VI has been critical to its longevity and relevance. Being able to innovate and adapt to changing contexts is no easy task and challenging on many fronts; VI has done that, and more. We’ll be keeping a closer eye on what they’re up to – and sharing it through Field Exchange – from now on.



Mother is screened for acute malnutrition, Somali district, Ethiopia, 2016

©UNICEF Ethiopia/2016/Nahom Tesfaye

Grandmother feeds her granddaughter RUTF, Afar region, Ethiopia, 2016

Interventions to build resilience of the health system to the El Niño drought in Ethiopia

By Amal Tucker Brown and Eric Alain Ategbo



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The findings, interpretations, and conclusions in this article 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: *Ethiopia*

What we know: The resilience of the health system to withstand shocks and surge to meet caseload demands is critical in emergency-prone contexts.

What this article adds: Applying a resilience lens, UNICEF Ethiopia examined the experiences and impact of linking nutrition development programmes with a well-coordinated emergency response to the El Niño drought in 2015/16. Integration of severe acute malnutrition (SAM) treatment into routine health services and scale-up of the national Community Based Nutrition (CBN) programme were key to a quick, high-quality response that averted a humanitarian catastrophe. A strong, comprehensive nutrition information system was important for risk-informed planning and to inform nutrition-sensitive interventions; more real-time capture and use of data will build on these strengths (RapidPro is being explored). Challenges related to nutrition commodity and essential medicines supply were addressed, but these resources require further integration into the government supply chain. Greater awareness and capacity on infant feeding in emergencies (IFE) response is needed by government, donors and non-governmental organisations (NGOs). UNICEF is piloting a project to improve the link between nutrition services and the Productive Safety Nets Programme (PSNP) to better meet the needs of the most vulnerable and those at risk of shocks.

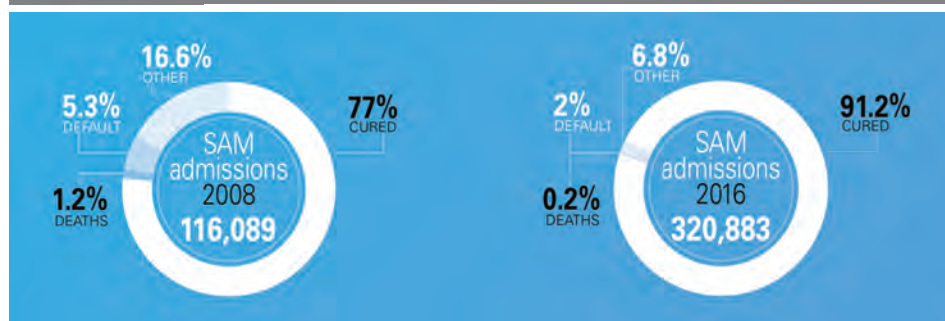
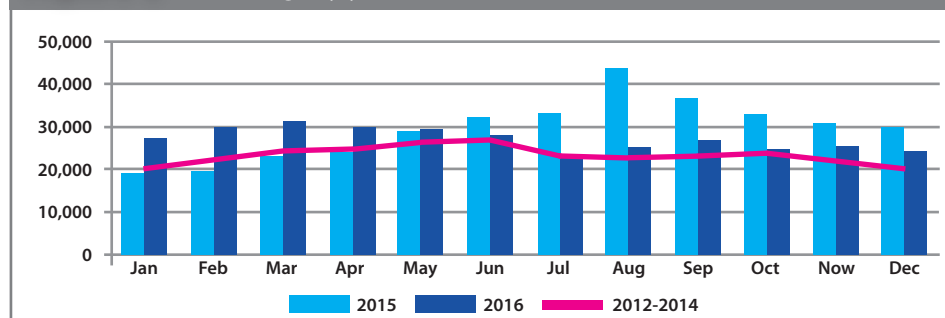
Background

Despite encouraging reductions in child under-nutrition since 2000, the burden of malnutrition is still widely felt in Ethiopia. Stunting rates among children under five (U5) years old have decreased sharply (from 58 % in 2000 to 38 % in 2016); however nearly two out of five children are still stunted (CSAE, 2016). Nearly a quarter of children U5 are still underweight, and wasting affects one tenth of children country-wide (CSAE, 2016). Furthermore, a significant proportion of Ethiopia's population is highly vulnerable to different forms of natural and complex disasters. Ethiopia's vulnerability is a function of its geographical location, topography and its adaptive capacity. Agriculture-dependent livelihoods and pastoral economies

are particularly vulnerable as unreliable rains impact food and nutrition security, which in turn particularly affects pastoralist households and smallholder farmers. Most of the Ethiopian population rely on rain-fed crop and livestock production (World Bank, 2015). In view of this precarious situation and following the 2011 Horn of Africa crisis, the concept of resilience was introduced into the development discourse in Ethiopia.

Rationale for resilience

Reducing malnutrition is a starting point in making households more resilient (Dufour, 2014). Given the high prevalence of malnutrition in Ethiopia, it is important to strengthen the resilience of the health system to withstand and recover from external shocks (such as drought) and stressors

Figure 1 Trends in SAM programme quality 2008-2016**Figure 2** Trends in SAM admission 2015 and 2016 compared to average 2012-2014 'non-emergency' year

(long-term processes such as climate change) to meet high caseload demands.

Resilience includes the dimensions of **absorptive capacity** (coping skills to buffer the impact of shocks), **adaptive capacity** (adjustment to the impacts of a stressor) and **transformative capacity** (the ability to create a new system or way of life as required) (Hoddinott, 2014). To improve the country's ability to withstand an emergency, programmes must use interventions that strengthen the absorptive, adaptive and transformative capacities of individuals, households and communities, as well as the health system as a whole.

In 2015 and 2016, Ethiopia was hit by the worst drought in decades. The failed 2015 summer rains (kiremt) that provide 80-85% of the country's agricultural harvest threatened the food and nutrition security of the whole country, devastating livelihoods and increasing malnutrition levels. Recognising the gravity of the situation and increased needs, the Govern-

ment of Ethiopia presented the 2016 Humanitarian Requirements Document (HRD), which estimated that 9.7 million people needed food aid on top of the existing eight million who are chronically food-insecure. The HRD predicted that 420,000 children would require treatment for severe acute malnutrition (SAM) and 3.2 million children and pregnant and lactating women (PLW) would be affected by moderate acute malnutrition (MAM).

Resilience in practice

Using the three dimensions of resilience, we examine how UNICEF supported Ethiopia by linking nutrition development programmes with a well-coordinated emergency response to the El Niño drought.

Absorptive capacity of the health system (ability to withstand the impact of shocks)

Due to the high SAM caseload in Ethiopia, in 2008 the Federal Ministry of Health (FMoH)



Breastfeeding mother, Halaba Woreda, SNNP region, Ethiopia, 2016

integrated SAM management into the Health Extension Programme (HEP) at health-post level (village level) to increase year-round access and coverage of SAM treatment. The number of facilities equipped to treat SAM has since risen steadily: from around 400 in 2008 to over 15,000 just before the onset of the El Niño drought emergency, with a recovery rate today of over 90% and a death rate of less than 1% (Figure 1).

This improved resilience enabled the health-care system to respond quickly and efficiently to the drought, reaching 350,451 SAM cases in 2015; a 40% increase compared to non-emergency years, and 320,883 cases in 2016; a 28% increase (Figure 2). The success of the 2015/2016 El Niño response compared to the 2011 Horn of Africa response is well documented (Babu et al, 2017).

The UNICEF-supported emergency nutrition coordination unit (ENCU), which functions as the nutrition cluster in Ethiopia, has been compiling *woreda*-level¹ SAM admission and programme quality data since 2008. This has enabled the ENCU to track monthly admissions for the whole country, establish seasonal trends and compare current admission levels to previous 'good' or 'bad' years. This allowed for timely alert of the upcoming emergency, ensuing early commitment of resources by donors, which resulted in the largest-ever procurement and decentralised preposition of ready-to-use therapeutic food (RUTF)².

¹ Districts, or woredas, are the third tier of administrative unit in Ethiopia. They are further subdivided into wards (kebele) or neighbourhood associations, which are the smallest unit of local government.

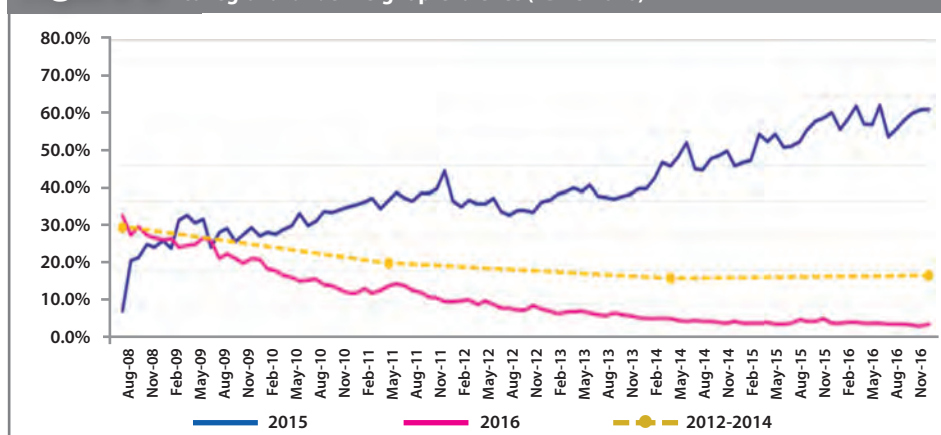
² http://www.unicef.org/esaro/5440_eth2016_therapeutic-food.html

Box 1 The Community Based Nutrition programme (CBN)

CBN activities include:

- Monthly **growth monitoring and promotion** (GMP) of children under two years of age for growth-faltering identification and appropriate counselling in agrarian regions.
- **Targeted counselling** on appropriate infant and young child feeding (IYCF) and childcare practices; water, sanitation and hygiene (WASH) practices; and maternal nutrition (individual, group and house-to-house counselling as needed).
- **Community mobilisation** and conversations on nutrition, WASH and health issues.
- **Micronutrient deficiency control** through vitamin A supplementation and deworming of children U5, deworming of pregnant women and supplementation of PLW with iron and folic acid.
- **Screening for acute malnutrition** in children U5 and PLW and referral for the treatment of acute malnutrition.
- **Referral** to health facility-based services for treatment of childhood illness (based on integrated management of childhood illness (ICCM)) and the HIV programme.

Figure 3 Underweight prevalence and participation in CBN programme compared to regional underweight prevalence (EDHS 2016)⁴



In 2008, the Government of Ethiopia also introduced the Community Based Nutrition programme (CBN), the objective of which is to improve the nutritional status of mothers and children through cost-effective and sustainable interventions in communities. In 2012, the CBN was integrated into the HEP, with health extension workers (HEWs) responsible for implementing the activities and community volunteers, known as the health development armies (HDAs), responsible for mobilising community members to participate in the full range of CBN activities.

CBN coverage increased gradually from 39 woredas to 386 woredas in 2016, covering 55% of all children under two years old. CBN has been successful in reducing underweight prevalence among its participants from around 25% in 2008 to only 5% in 2016. To maintain the gains achieved in the prevalence of underweight, the programme was maintained during the emergency, resulting in only a slight increase in underweight prevalence to just under 6% compared to the regional average of 20%.³

The CBN programme also contributed to increased quality of CMAM services during the emergency. Compared to non-CBN supported woredas, the UNICEF-supported CBN woredas⁵

had better CMAM cure rate (92% vs. 90%; a difference of 8,400 SAM cases), reporting rate (93% vs 55%), SAM treatment coverage (95% vs 76%) and screening coverage (71% vs 61%). In addition, they had lower death rates (1% vs 2%) and default rates (0% vs 3%). In the CBN woredas the children were therefore not only less likely to be malnourished, they were also more likely to be identified, treated and cured and less likely to default or die once admitted to the CMAM programme. This suggests that CBN, a development programme, was important in strengthening the system to enable it to respond quickly to the emergency and identify children who require SAM treatment.

Adaptive capacity of the health system (adjustment to stress)

The ENCU leads a woreda-level hotspot classification system, with hotspot priority one being equivalent to a humanitarian emergency. This enables improved risk-informed planning of response according to the severity of the situation.

The SAM nutrition information system was enhanced by harmonising the regional and federal databases and aligning the SAM data schedule with the Health Management Information System (HMIS) schedule, thus reducing

the minimum lag-time for data to reach federal level from eight-ten weeks to six weeks. This enabled improved risk-informed planning (see below); however the six-week lag-time remained a challenge in timely risk-informed planning throughout the emergency. Nevertheless, the improved analysis of the data highlighted health facilities with overwhelmingly high caseloads. In response, additional facilities were equipped to treat SAM cases and by the end of 2016, the total number of such facilities was 16,687, plus an additional 49 mobile health and nutrition teams (MHNTs) for hard-to-reach and under-served areas.

Prior to the emergency, active screening was conducted every three months in agrarian regions and every six months in pastoralist areas, with passive screening conducted all year round as and when the population accessed the health facility. This resulted in large peaks in admissions, as well as late referral of SAM cases for treatment. In July 2015, the FMoH sent out a directive to all health facilities to shift from quarterly to monthly active screening in all hotspot priority-one woredas. This resulted in a marked increase in the number of SAM cases identified and a reduction in the number of SAM cases with complications. However, this approach also caused screening fatigue (of the population and the HEW), leading to a reduction in screening coverage over time, as well as an increased workload on the HEW. This highlighted a need to review existing screening methods.

Transformative capacity of the health system (new ways of working)

In Ethiopia the role of international non-governmental organisations (INGOs) has shifted from direct service delivery in 2003 to technical backstopping, capacity-building and logistic support in priority-one woredas (Andert et al, 2017). But, with as many as 219 priority-one woredas during the emergency, further prioritisation was needed. ENCU developed a woreda capacity-mapping tool to assess each woreda's capacity to support the increased need. The tool was developed using routine data, such as CMAM programme quality indicators, caseload per facility, proxy prevalence of MAM and SAM as defined by mid-upper arm circumference (MUAC) screening, physical accessibility and distance from regional health bureau. This guided INGOs towards woredas with limited capacity and was used to alert donors for additional funds. Local non-governmental organisations (NGOs) were not able to access emergency funds and had limited capacity to respond at woreda level. However, as described in Andert et al, 2017, GOAL sub-granted funds to local NGOs and provided technical oversight.

UNICEF is responsible for procuring and distributing nutrition supplies at regional level; the government distributes these supplies to lower-level health tiers, along with essential



Community members gather for screening, Rujis Health post, North Jijiga, Awbare woreda, Ethiopia, 2016

³ Taking into account woredas that were supported by an NGO during the emergency.

⁴ See footnote [3]

⁵ See footnote [3]

Box 2 RapidPro

UNICEF Innovation has been working with SMS systems since 2007; RapidPro was developed in 2014. It is a free, open-source framework designed to send and receive data using basic mobile phones, manage complex workflows, automate analysis and present data in real-time.

UNICEF Ethiopia has been exploring with FMOH the possibility of introducing RapidPro for improved and speedy data collection into Ethiopia. HEWs can use their personal mobile phones to register and send data, so there is no need to procure special IT materials, tablets or phones. Following a one-day training on how to register their phone and send programme data to the RapidPro server, the HEW can start to share key programme data such as screening data, SAM admissions and nutrition commodity stocks rapidly.

By having the server at FMOH, sensitive information will be contained within Ethiopia and approval at every level will ensure that sharing of sensitive data is controlled. As there is only one telephone provider in the country, negotiation with this provider will ensure that the HEW does not incur any cost when sending/receiving SMS.

The system can be tailored to the Ethiopian context, designed to recognise critical events and immediately send warnings to those responsible for responding. The system would also produce regular automated reports to send to all necessary programme staff from district to national level.

medication to treat SAM cases with complications. This dual delivery system was uncoordinated and affected the quality of SAM treatment. To address this, UNICEF worked with the government to provide and distribute standardised treatment kits. The World Health Organization (WHO) supported the FMOH to coordinate the health cluster and ensured that the essential drugs from FMOH were sufficient to meet the SAM caseloads as well as the paediatric needs of the country.

Protecting infant and young child feeding (IYCF) practices is essential to prevent increases in mortality, disease and malnutrition. Protecting IYCF during an emergency (IYCF-E) is even more important as crowded living conditions and lack of water in some communities, particularly those displaced by the drought, increase the risk of disease incidence.

Field visits by UNICEF and partners found that breastfeeding was being interrupted during the emergency. Following UNICEF and partners' advocacy efforts, the FMOH introduced IYCF-E into the response for the first time, using the CMAM platform and development programmes such as the CBN to reach a higher number of caregivers. However, IYCF-E implementation, namely training of HEW on IYCF-E support to women at the lower level,⁶ was delayed due to late prioritisation of IYCF-E by donors and lack of IYCF-E skills by many partners. The FMOH recognised the importance of IYCF-E and will be incorporating it (specifically how to identify the risks in the community during an emergency and how to support mothers/caregivers in assuring optimal IYCF) into the national integrated refresher training for HEWs and into all future trainings for health staff. Additional capacity-building of INGOs is necessary to ensure they are equipped to support the FMOH on IYCF-E in future emergencies.

Nutrition data were used by the food security cluster to prioritise general food distribution (GFD). This helped ensure that woredas with a high SAM/MAM caseload were reached first. The data were also used by the water, sanitation and hygiene (WASH) sector to identify woredas requiring immediate WASH interventions. This

convergence of activity and better targeting proved to be an essential part of the response. However, further work is needed to develop a minimum package of WASH/nutrition/GFD intervention and to take account of protection issues in order to deliver a multisector response.

Lessons learned

The integration of SAM treatment into the routine health service package, along with the scale-up of the CBN programme, were key to responding quickly with high-quality services to the emergency, thereby averting a humanitarian catastrophe. There is a need now to look at how HEWs can be strengthened to identify local triggers to shocks and tailor their activities to respond to the emergency context before a full emergency is declared. A strong and comprehensive nutrition information system was important for risk-informed planning, which ensured adaptive and transformative actions. However, real-time monitoring is necessary to accelerate the availability of data from health posts for quicker planning and action at all levels. High-quality nutrition information was also essential for other clusters to prioritise woredas for nutrition-sensitive interventions.

Moving forward

The Productive Safety Net Programme (PSNP) was introduced in Ethiopia in 2005. It is one of the largest social protection programmes in Africa, covering approximately eight million people, including 11% of all rural households (15% of all female-headed households in rural areas). In 2015, the PSNP was modified to be more nutrition-sensitive and the new PSNP4 was launched in 2016. At the higher level, nutrition indicators (stunting in children U5 and household dietary diversity (HDD)) were included as a major programme outcome. At the grassroots level, provision was made to exempt pregnant women in PSNP households from public work; non-PSNP households with SAM cases could become transient beneficiaries of PSNP and PSNP public workers (mainly men) could trade half a day of labour to attend an education session including nutrition, child protection and hygiene, and sanitation. The emergency showed that only 60% of SAM cases in PSNP



households were reached. In addition, there was no referral system for SAM children from non-PSNP households to receive temporary support. UNICEF is piloting a project to improve the link between nutrition services and the PSNP which will not only strengthen the resilience of the health system to respond to emergencies, but also contribute to household resilience, thus protecting the malnourished child.

RUTF is already part of the government essential medicines list. UNICEF, along with WHO, is part of the technical working group supporting the government in the integration of nutrition commodities into the government pharmaceutical supplies management system for a more sustainable and coordinated delivery of nutrition supplies in emergencies.

Finally, UNICEF is in continuous discussions with the government to introduce real-time monitoring, such as RapidPro (Box 2), into the health system to reduce lag time from facility to regional and federal level for quicker risk-informed planning.

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⁶ Establishment of breastfeeding friendly spaces were deemed not necessary in the majority of cases (IYCF indicators were integrated in all displaced population rapid assessments) apart for Siti Zone in Somali region where the drought affected population movement.

References

- Andert C, Muzeijn Z, Barthorp H and O'Mahony S. (2017). *CMAM scale-up: experience from Ethiopia's El Niño response 2016*. Field Exchange 54, February 2017. p11. www.enonline.net/fex/54/cmamelininoethiopia
- Babu G, Rutishauser-Perera A and Prudhon C. (2017). *Assessing the differences in the scale of nutrition response efforts to El Niño in Ethiopia*. Field Exchange 54, February 2017. p98. www.enonline.net/fex/54/elniñoethiopia
- CSAE 2016. Central Statistics Agency Ethiopia, 2016. *Ethiopia Demographic and Health Survey 2016: Key Indicators Report*. October 2016.
- Dufour AO. (2014). *Strengthening the Links between Resilience and Nutrition: A proposed Approach*, IFPRI.
- Hoddinott J. (2014). *Understanding Resilience for Food and Nutrition Security*, IFPRI.
- World Bank (2015). *Ethiopia Poverty Assessment*, 2014.

Multi-sector, nutrition-sensitive response to drought emergency in Pakistan

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Child receiving treatment at OTP site in a targeted village in Umerkot district, Pakistan, 2015



Location: Pakistan

What we know: Undernutrition is multi-causal; nutrition-specific and nutrition-sensitive interventions are warranted.

What this article adds: A one-year, integrated, multi-sector project targeted communities at nutrition risk in an emergency response to drought in Sindh, Pakistan. Government departments at district level were engaged throughout. Nutrition-specific interventions involved community-based management of acute malnutrition (CMAM) and infant and young child feeding (IYCF) support. Nutrition-sensitive interventions involved seasonal cash for training, livestock assistance, improvement of communal wells and rain harvesting, and community hygiene outreach. The project aimed to target 80% of households with a malnourished child with nutrition-sensitive interventions in nutritional 'hotspot' villages. Positive impacts on access to CMAM treatment and IYCF support, livestock (milk production), hygiene practices and availability of safer water sources were reported. Beneficiaries increased expenditure on food and non-food items (especially agricultural inputs) and reduced use of costly, informal credit systems. Ambitious targets on water-borne disease and safe water access were not realised due to underestimated and challenging needs. Households successfully supported to build latrines (n=2,500) soon reverted to open defecation. Only one third of nutritionally vulnerable households were targeted by nutrition-sensitive interventions due to cost limitations. Informed by lessons learned, a follow-up project includes more livestock interventions, a community-led total sanitation (CLTS) approach and an exit strategy to sustain the CMAM programme led by government.

Introduction

Pakistan, a lower middle-income country with the sixth largest population in the world, has an exceptionally high level of child undernutrition. According to the Global Nutrition Report 2016, stunting prevalence, at 45%, ranks 125 out of 132 countries, while wasting prevalence, at 11%, ranks 107 out of 130 countries (countries ranked lowest to highest); the country is sixth highest out of 185 countries in terms of anaemia prevalence (51.1%) (IFPRI, 2016). Pakistan is ranked 109 out of 118 countries on the Global Hunger Index (countries ranked lowest to highest score) (Global Hunger Index, 2016). One of the major contributing factors to the poor nutrition situation is natural disaster; a consequence of climate change, the country has experienced 63 natural disasters from 1935 to 2011 (Global Hunger Index, 2016) (see Figure 1). The frequency of drought affecting the country is increasing due to a gradual

increase in temperatures. Thar Desert in Sindh Province has been most severely affected. It is an area covering 25,246 square kilometres with a population of 1,023,000 residing in two districts (Tharparkar and Umerkot). The area experienced a severe drought from 2013 until 2015 and recovery interventions are still underway.

In Thar Desert, 19.1% of children under five years old and 18.9% of pregnant and lactating women (PLW) are acutely malnourished (Concern Worldwide, 2016). Hundreds of children were reported to have died due to malnutrition over the last one and half years and 49% of large livestock and 59% of small livestock have died and/or been sold to try and meet immediate family needs (FSWGP, 2015). In terms of vulnerability, 68% of the population in the Thar Desert area fall under the category of poor and very poor (FSWGP et al, 2015).

Media Hub

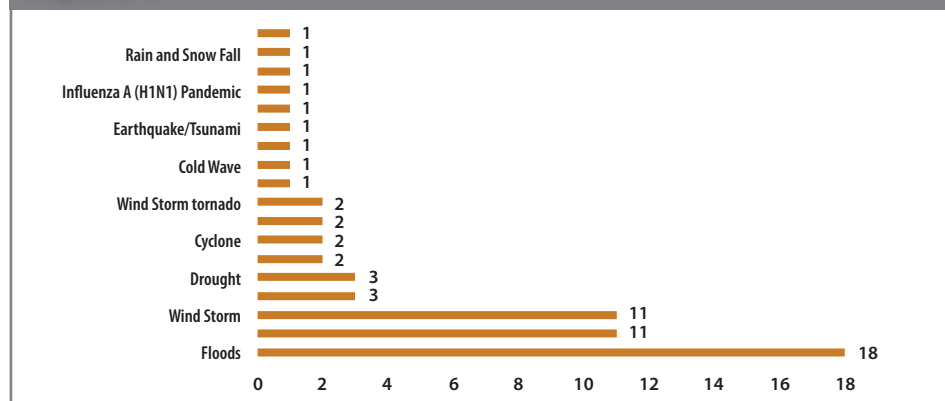


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Table 1 Project indicators

Component	Indicators
Nutrition-specific	<ol style="list-style-type: none"> 1. Percentage of children with severe acute malnutrition (SAM) having access to appropriate treatment, including therapeutic food. 2. Percentage of children (0-5 months of age) who are fed exclusively with breastmilk.
Nutrition-sensitive	<ol style="list-style-type: none"> 1. Percentage of the target population achieving acceptable food consumption score (FCS) (within last 7 days). 2. The proportion of households in the highest Coping Strategy Index score category has been reduced (Reduced CSI). 3. Prevalence of water-borne and water-related diseases in targeted population.

Figure 1 Frequency of natural disasters in Pakistan from 1935 until 2011Information sourced from: www.pakresponse.info

Integrated multi-sector intervention

An integrated multi-sector project was developed to support nutrition at-risk communities in response to the continued drought emergency in Sindh, Pakistan. The project was designed by two Alliance2015¹ members; Concern Worldwide and Deutsche Welthungerhilfe (WHH), funded by European Civil Protection and Humanitarian Aid Operations (ECHO). The principal project goal was to improve resilience of the drought-affected population in Sindh Province. More specifically, the project aimed to meet immediate humanitarian needs of drought-affected communities through an integrated nutrition, food security and livelihoods (FSL) and water, sanitation and hygiene (WASH) response in Umerkot and Tharparkar Districts. Tehsil Umerkot in Umerkot District and Tehsil Chachro in Tharparkar District were selected as most severely

affected by drought with high global acute malnutrition (GAM) prevalence. The project was implemented from May 2015 to August 2016.

A baseline study was conducted in June 2015 and an endline study in August 2016. A mix of quantitative and qualitative methods was used, including household interviews, collection of health-related data from government health facilities and focus group discussions (FGDs). For both baseline and endline studies, the sample for household interviews was 409 and nine FGDs were conducted with beneficiaries from nine villages.

The project aimed to reduce the prevalence of acute malnutrition through nutrition-specific interventions (community-based management of acute malnutrition (CMAM) and infant and young child feeding (IYCF) support) combined with nutrition-sensitive actions, that addressed

important, interdependent factors; specifically maternal, infant and child care practices²; hygiene measures; provision of water infrastructure; access to nutritiously rich and diverse diet; and livestock management. Nutrition-sensitive interventions involved:

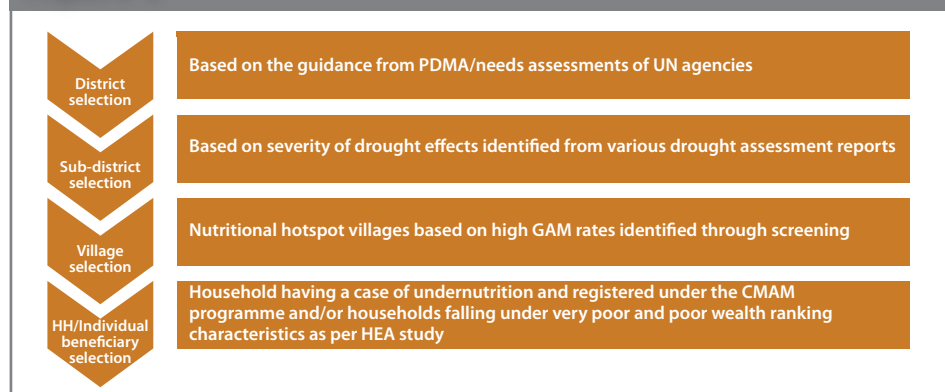
- Provision of cash through cash for training (CfT) (nutrition, agriculture and livestock management) to the drought-affected malnourished households.
- Provision of livestock assistance, involving vaccination and deworming, livestock management sessions and clinics with the support of the government livestock department.
- Installation of solar-powered, water-pumping systems on existing communal wells.
- Construction of rain-harvesting water ponds.
- Hygiene promotion through community outreach workers.

Nutrition-sensitive targeting was largely determined by the nutrition-specific component, whereby households with children enrolled in the CMAM programme were referred to the FSL and WASH services. The project aimed to reach at least 80% of households out of the nutrition caseload in nutrition 'hotspots' and support them through FSL and WASH interventions (see Figure 2). Geographic targeting within the selected tehsils³ also followed the nutritional hotspot approach. This involved screening all children aged 6-59 months to calculate a village GAM prevalence; those with the highest GAM rate were selected for the intervention. The remainder of the FSL and WASH-related beneficiaries were identified from the same nutritional hotspot villages using the vulnerability criteria guided by the Household Economy Analysis (HEA) study (i.e. very poor and poor households by wealth ranking). Integrated indicators were designed for the project (see Table 1).

Implementation process and impact of the project

CMAM/IYCF programme

Concern Worldwide implemented a nutrition-specific response, targeting children under five years old and PLW, involving CMAM service set-up, community mobilisation for uptake of health and nutrition services, and behaviour change communication (BCC) for improved IYCF and care practices. Quality treatment was provided to severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) cases and moderately malnourished PLW at the community level through mobile teams. SAM children with complications were treated in the stabilisation centres (SCs) established with the support of Concern Worldwide in the district headquarter hospitals. Orientation sessions (one-to-one and in groups) were held for mothers of malnourished children, caregivers, PLW and other women on

Figure 2 Nutrition-sensitive geographic targeting process

¹ <http://alliance2015.org/>

² IYCF activities were mainly nutrition-specific, however, some IYCF messages were also covered by nutrition sensitive actions.

³ An administrative division denoting a sub-district.

Table 2 Nutrition-sensitive messages by sector

Topics	Key messages
Nutrition	<ul style="list-style-type: none"> What is nutrition and malnutrition? (pictorial examples), anthropometric measurement (mid-upper arm circumference (MUAC)) and importance of nutrition for human body growth. Different types of nutrients and their role in growth (showing pictures of different food items containing major nutrients). Sources of nutrients (such as vegetables, fruits, dried fruits, fish, lentils). Importance of hand-washing, when, how to do hand-washing (illustrated pictures) and importance of water in personal hygiene. How food and water become contaminated and how to keep them safe from contamination. Food items for PLW and children, importance of breastfeeding, especially newborn infants. Water-borne diseases, water treatment methods/ techniques at local level and their benefits.
Agriculture	<ul style="list-style-type: none"> Seasons (kharif, rabi) and crops/vegetables which are mainly grown in Tharparkar region, seasonal calendar. Diversified food options, e.g. bajra (millet) production and utilisation. Kitchen gardening: simple methods to grow certain vegetables at home in pots, wild foods naturally grown in the area (such as mushrooms and water melons) and how to tend to vegetables and their nutritional value.
Livestock	<ul style="list-style-type: none"> Types of livestock, feeds, fodder and natural pastures available in drought areas (illustrated by pictures). Importance of livestock for nutrition (milk), livestock space (open grazing), shade (protection from direct sun), watering and local livestock diseases. Vaccination and deworming calendar (calendar in local language dispatched in community for future reference) and livestock feed management at local level. Formulation of nutritive feeds from locally available resources for livestock.

topics such as breastfeeding, complementary feeding, ante- and post-natal care and personal hygiene. Breastfeeding corners were established at each CMAM static site for privacy and to provide mothers with counselling on IYCF-related issues. Mother support groups were also formed in each union council, comprising eight to ten women. These women were trained on screening of children and PLW and delivery of key messages on nutrition, FSL and WASH issues to women from their areas. During the project life, 61,693 children under five years of age and 27,494 PLW were screened. A total of 6,071 SAM cases, 11,395 MAM children and 9,201 malnourished PLW were treated in the CMAM programme.

Food security and livelihoods (FSL) programme

Food security and livelihoods-related interventions were designed to increase access of the targeted beneficiaries to adequate and diversified food through appropriate activities. The main activities under the FSL component were cash-transfer programming and livestock assistance.

Cash for training (CfT)

CfT targeted drought-affected malnourished households (referred from the nutrition programme), PLW and the most vulnerable people (those with disabilities and older people). It was designed to cover the extreme lean periods (September to November and March to August) when daytime temperatures can reach 50 degrees Celsius. The cash assistance was conditional on attending awareness sessions that delivered nutrition-sensitive key messages on nutrition, livestock and agriculture management; these focused on critical behaviours identified through a baseline knowledge, attitude and practices (KAP) survey (see Table 2). Each selected beneficiary received two days training on nutrition-sensitive messages followed by cash disbursement of PKR 6,000 (54 euros) per cycle through electronic mobile payment (Jazz Cash). There were three cycles so each beneficiary received a total of PKR 18,000 (162 euros). The cash amount was calculated based on the World Food Programme (WFP) food basket value for Pakistan. Cash disbursement was conducted in clusters near to

the beneficiaries' household, given the poor roads and transport facilities. The training time and duration was flexible in consideration of the target groups.

The baseline study found that, on average, beneficiaries were spending 88 euros on all monthly household expenses, including food, non-food and other expenses. At endline, monthly household expenditure was 128 euros, a rise of 40 euros, which is attributed to the cash assistance. Trend analysis shows that beneficiaries increased expenditures on food, health, agriculture inputs, clothing and other non-food items. The major area of increased expenditure was buying agricultural inputs for the forthcoming cropping season, while there was a considerable reduction in loans repayment; this suggests that those receiving cash switched to cash purchase in favour of the traditional structural credit system⁴ (see Figure 3). A total of 15,288 female individuals (PLW/child caregivers) were covered under this activity; males accounted for 6% (n=908) of beneficiaries.

Livestock vaccination and de-worming

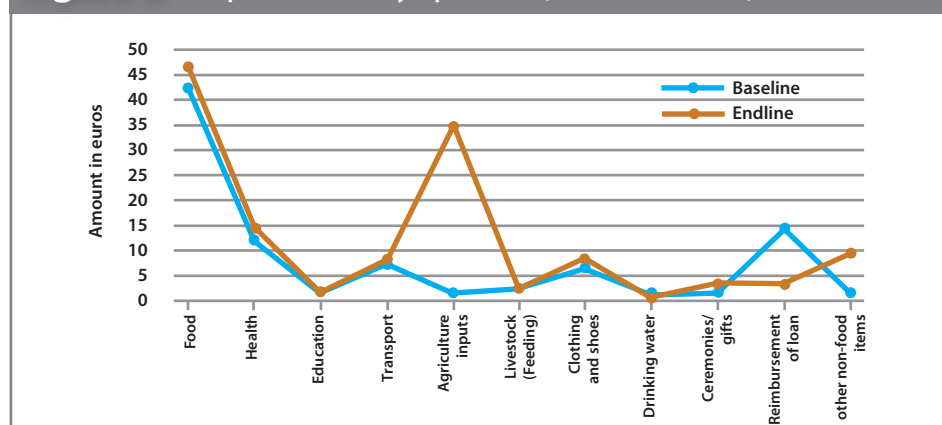
In Tharparkar and Umerkot most household livelihoods depend on rearing livestock (mainly small livestock). Heightened disease prevalence in drought conditions results in livestock mortality or weaker animals, for which there is a lower net return compared to healthy animals. To improve livestock immunity and good animal health, vaccination and deworming activities were planned with the support of the government livestock department for all targeted households in the area. Vaccination/deworming campaigns were organised at each village level where all small livestock (goats/sheep) and large livestock (cattle) were treated. The livestock of surrounding villages and communities were also covered to avoid any disease outbreak that may affect the project targeted areas. A total of 125,957 animals (102,468 small and 23,489 large) were reached through this activity. Beneficiaries reported positive impact on their livestock due to the vaccination/deworming assistance: 100% of beneficiaries mentioned increase in milk production.

Water, sanitation and hygiene (WASH)

The WASH component involved both household and communal interventions for the population covered by the nutrition component.

Access to drinking water

Communal and household-level schemes were designed to improve community access to drinking water. In some villages, mostly females were responsible for collecting water from deep-dug wells (around 300ft) by pulling ropes in groups or using animals (donkey, camel). This laborious task and distance to the dug wells were creating health hazards for women, especially PLW, so solar-powered water-pumping machines were

Figure 3 Comparison of monthly expenditures (baseline and endline)

⁴ A traditional conventional credit system prevails in the area, which communities use to get food and non-food items/or cash for household expenditure. It commands a high interest rate and whenever borrowers need a new loan (cash or in kind) they must adjust the existing loan.

installed on a total of 12 dug wells. An additional 100 villages were identified from the hotspots for rehabilitation of depression sites⁵. Local villagers were engaged in the rehabilitation work through cash for work. The project also assisted 1,350 households from the same villages who had SAM cases, for construction of household underground water tanks. The tank is dual-purpose; for household water storage and to harvest rainwater during rains.

Endline review found that, on average, a household collected four litres of water for drinking, three litres for cooking and seven litres for washing, an overall increase of 4.5 litres from baseline. In terms of water sources, more than half of the respondent households utilise wells without solar pumps in both districts and 22% use hand pumps, mainly in Umerkot. More than 90% of the sampled households believe that it is safe to collect water from these points or sources. All the households have containers to store and fetch water, with each household having at least three containers (as at baseline); improvements were seen at endline regarding cleaning the containers.

Hygiene promotion

Hygiene promotion was integrated into all project-awareness sessions. Key messages included critical times and appropriate methods for hand-washing, personal and household hygiene and water treatment at household level. Hygiene-promotion campaigns, celebration of WASH-related days, hygiene-promotion activities in schools, and hygiene-promotion messages through trained community outreach workers were some of the main approaches adopted to improve behaviours. In total, 34,500 families were reached through the hygiene-promotion component.

At endline, 11% of households reported washing their hands during all five critical times (compared to none at baseline), of whom 44% used soap and the remainder used local sand and water. At baseline, 95% of targeted beneficiaries had no latrines; at endline, 28% had latrines and were using them. Most (97%) realised the importance of latrines and the health hazards of open defecation.

Construction of low-cost latrines

The baseline study found that around 28% of

the population had pit latrines in use. A total of 2,500 families were identified from the nutritional hotspot villages who did not have latrines and were defecating in the open. These families were supported for construction of low-cost latrines; latrine construction material was provided while they contributed voluntary labour. Despite this assistance and sensitisation on the importance of latrine use, use of latrines has not improved as much as anticipated. Although all 2,500 households constructed latrines and initially used them, many reverted to open defecation.

Coordination mechanism

The coordination mechanism for the project was developed at national, provincial and district levels. Existing Nutrition Working Groups (chaired by UNICEF under the Ministry of Health) and Food Security Working Groups (chaired by FAO and WFP under the Ministry of National Food Security and Research) at national and provincial levels were on board from project design until end. Project progress was continuously shared with the working groups through a '4W' (who, what, where and when) matrix and other reporting mechanisms. In addition, the Pakistan Humanitarian Forum (PHF)⁶, the Provincial Disaster Management Authority Sindh (PDMA)⁷ and Sindh Nutrition Cell⁸ were kept closely informed. The active coordination hub for the project implementation was at district level; district-level coordination is led by district commissioners, who lead all interventions of government departments, non-governmental organisations (NGOs) and civil society organisations (CSOs). Formal memoranda of understanding (MoU) were signed with district livestock and health departments to ensure close coordination and engagement in the project implementation process. Regular coordination meetings were held with the relevant district departments and formal monthly progress reports were submitted.

Project tasks were distributed among three local partner NGOs; one led on the nutrition-specific component and two delivered the nutrition-sensitive component. A coordination mechanism was developed at field level consisting of project management and technical staff of the partner NGOs and Concern Worldwide and WHH field teams. Regular monthly meetings helped address operational issues on the ground.

Field visits of the ECHO country team and experts from regional and head office also provided guidance and assistance on emerging project needs.

Results/impact of the project

Endline review of project indicators shows the project exceeded targets for indicators relating to SAM treatment, exclusive breastfeeding, food consumption score (FCS) and household poverty ranking (see Table 5). While prevalence of water-borne illness at baseline (<22%) was already below the target value (<50%), it increased during the life of the project.

Lessons learned

Integrated, multi-sector, nutrition-sensitive programming to address the issues of malnutrition

Although many interventions have been implemented in the targeted area to address the drought situation, all were 'nutrition-blind' with no nutrition objectives. This was the first integrated, multi-sector intervention to respond to the current drought situation. The successful implementation and the results of the intervention indicate that multi-sector interventions with a nutritional lens are an appropriate and effective way to tackle the drought situation, quickly achieving results on factors associated with undernutrition in Pakistan. A SMART survey has just been completed in the area (June 2017) and is under analysis.

Strong coordination among relevant stakeholders (UNICEF, WFP, Nutrition Cell, government line departments and local NGO partners)

The coordination, activism and support from the government reflected the commitment of the state towards tackling undernutrition issues in drought-affected areas of the country. There was active involvement of many stakeholders, including UNICEF, WFP, Provincial Nutrition Cell, government line departments and international and local NGO partners. Well-designed and hierarchical coordination from national to district level with government departments and other stakeholders contributed to the effectiveness of the intervention.

Pooling different expertise of humanitarian sector brings drastic results

The nutrition-specific and nutrition-sensitive activities were implemented by different local partners, playing to their respective strengths. There was good collaboration: partners who implemented the nutrition-specific interventions

Table 3 Achievements of the project against set indicators

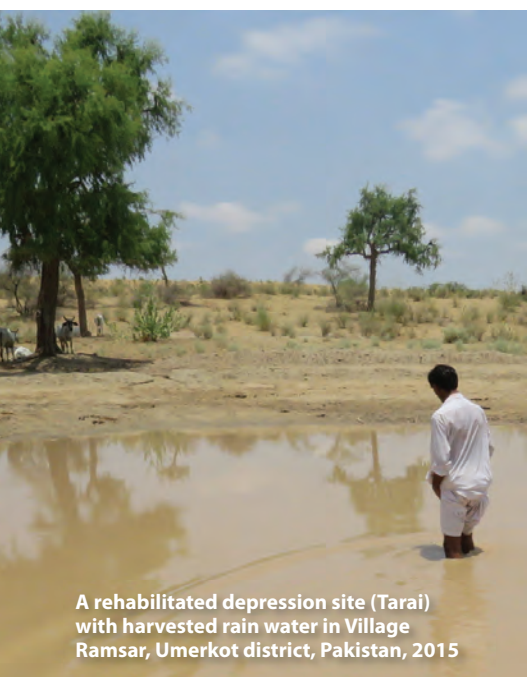
Indicator	Target value	Baseline value	Final progress value
% of children with SAM having access to appropriate treatment, including therapeutic food	>50% (Sphere standards)	0%	55%
% of children (0-5 months of age) who are fed exclusively with breast milk	65%	36%	75%
% of the target population achieving acceptable food consumption score (FCS)	38%	0%	58%
Reduction of proportion of households in the highest coping strategy index score category (Reduced CSI)	20%	34%	59%
Prevalence of water-borne and water-related diseases in target population	<50% of population report	<22% of population report	<27% of population report

⁵ Natural places where rainwater gathers from the surrounding sand dunes. The land of that site is compressed and therefore its water-holding capacity is increased. Rainwater stands for long periods at such a site, locally called *tara* (depression site).

⁶ PHF is the coordination forum consisting of all the humanitarian international non-governmental organisations (INGOs) working in Pakistan.

⁷ PDMA is a government body which takes the lead on all the disaster/humanitarian related work in the Province.

⁸ The Cell is led by Department of Health, Government of Sindh and UNICEF.



A rehabilitated depression site (Tarai) with harvested rain water in Village Ramsar, Umerkot district, Pakistan, 2015

were responsible for identifying nutritional hotspot communities and beneficiaries to the nutrition-sensitive partners.

Synergies of the project with other interventions in the area

WHH and Concern Worldwide have other long-running interventions in the area that aim to build resilience of the communities while responding to the emergency situation. Synergies were developed between the humanitarian and development programmes. For example, long-term WHH nutrition-sensitive programmes funded by Germany were also covered by the CMAM and nutrition-sensitive programmes.

Although the project achieved its intended results, some of the project areas were not as successful as anticipated. Some of these areas are elaborated below:



A newly constructed household water tank (for water storage and rain water harvesting) in Village Lala-Bah, Umerkot district, Pakistan, 2015

Imbalance between nutrition-specific and nutrition-sensitive interventions

There was 100% coverage of nutrition-specific interventions; however only 32% of the nutrition-specific beneficiaries were covered by the nutrition-sensitive component. This was due to cost; nutrition-specific components cost 1.6 euros per beneficiary, whereas 10.3 euros were spent per beneficiary for nutrition-sensitive interventions.⁹ This suggests that nutrition-sensitive interventions need greater investment to ensure reach.

Reduction in open defecation practices

It was planned to tackle open defecation practices through hygiene promotion and latrine construction. However, increasing awareness of the health hazards of open defecation and latrine construction yielded poor results. Changing ingrained behaviours requires a long-term strategy that is difficult to realise in a short-term emergency project.

Prevalence of water-borne and water-related diseases in targeted population

This was the first multi-sector intervention by WHH and Concern that ambitiously aimed to reduce water-related disease prevalence in the target population. However, the field realities were not fully appreciated at the time of intervention design and baseline. The water shortage in the area and resulting utilisation of turbid and contaminated water (as the only source) continued throughout the implementation period. Project scope was limited by resources, so the extensive water-related needs of all populations could not be catered for.

The main enabling factors which contributed to smooth implementation of the project were:

- Donor commitment to address recurrent drought and malnutrition.
- Local human resource pool (qualified local staff for project implementation were available in the area.
- Presence of relevant government line departments at grass-roots level, with active participation and interest of district administration in the project.
- Interest of provincial government in nutrition issues.
- Sensitivity to and involvement of the community; the project was designed to address immediate needs of the communities.
- Supportive social and cultural norms; Muslim and Hindu communities are equally represented in the area and welcomed the intervention, irrespective of diverse norms and religions.
- Streamlined procurement regulations to enable easier procurement by partners.

The main constraints faced by the project related to weather, access and the short project duration. Extreme weather conditions (high temperatures), poor communication infrastructure (no proper link roads) and difficult, costly and time-consuming transportation were major hindrances

that project staff faced. Establishing a new multi-sector intervention within a short timeframe was challenging; a quarter of the project time was taken up with inception and preparation.

Conclusion

Within a short timeframe a multi-sector project, involving nutrition-specific and nutrition-sensitive interventions and cross-sector coordination, was successfully established in a drought-affected community and achieved impact. As this project was funded by ECHO for the short-term (emergency response funding), Concern Worldwide and WHH planned to mobilise more funding to maintain the response with a view to reducing undernutrition prevalence to below emergency thresholds. At the end of the project term, Concern Worldwide continued the nutrition-specific (i.e. CMAM) component, pending development of a follow-up project (the nutrition-sensitive component was not extended). This helped to stabilise the undernutrition situation in the area by avoiding a break in service. A one-year, follow-up project has been designed and informed by lessons learned, which has since been approved for ECHO funding.

New elements include the scale-up of the livestock assistance component. The first project only involved deworming, while the new project includes livestock vaccination (the government livestock department administers the vaccination and the project provides community mobilisation and logistics arrangements). Animal health clinic days have also been added; again, the government livestock department provides veterinary doctors and the project arranges the clinics in rural areas. Given the poor return on the household latrines intervention, this component has been dropped from the next phase. Instead, a community-led total sanitation (CLTS) approach has been added to galvanise communities on the issue of open defecation, along with awareness-raising and sensitisation. To complement this, a pool of outreach workers for hygiene promotion will be deployed in all targeted villages. A clearer exit strategy has been formulated; on completion of the ECHO-funded phase, the CMAM programme will be continued by government through one of its World Bank-funded nutrition programmes.

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⁹ Cost per beneficiary was calculated by distributing the whole budget 'programme + administrative' per sector into the total number of beneficiaries covered.

References

- International Food Policy Research Institute (IFPRI). 2016. *Global Nutrition Report 2016: From Promise to Impact: Ending Malnutrition by 2030*. Washington, DC.
- Global Hunger Index 2016. <http://ghii.ifpri.org/>
- Concern Worldwide (2016) SMART Survey Report, District Umerkot, January 2016.
- Food Security Working Group Pakistan (FSWGP) (2015). Sindh drought needs assessment, 2015.
- Food Security Working Group Pakistan (FSWGP), Concern Worldwide and Welthungerhilfe (2015) Household economy analysis.

People in aid

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Nicki Connell, Nutrition Advisor with Save the Children US, dipping into Field Exchange in Beirut airport on way home from Global Nutrition Cluster meeting



Salome Yesudas, an author in this edition, reading Field Exchange at home in Tamil Nadu State, India



Participants in WHO scoping meeting for guideline development on counselling and support for breastfeeding, held in Geneva, 11-12 May, 2017



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Front cover

A child inside the besieged city of Taiz, Yemen; WFP/Ahmed Basha, Yemen, 2016.

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

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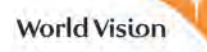
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