

Field Exchange

Emergency Nutrition Network



- **Rapid response in DRC**
- **Multi-sectoral nutrition programming in Nepal and Uganda**
- **Nutrition response in Ethiopia: 2011 v 2016**
- **Mobile health app – five country experiences**
- **Cash programming in Greece**
- **Non-communicable disease management in Jordan**
- **Integrated SAM treatment in Lebanon**
- **Care groups in South Sudan**
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Dear readers

A number of the recommendations in the Grand Bargain reported on in the last issue of *Field Exchange*¹ speak to the need to forge stronger links between humanitarian and development programming. Five of the field articles in this issue of *Field Exchange* relate, in one way or another, to this theme. An article by Alain Georges Tchamba describes the rapid scale up treatment of severe acute malnutrition (SAM) in the Democratic Republic of the Congo (DRC) led by COOPI in collaboration with UNICEF and government. This six month intervention, triggered on exceeding SAM prevalence thresholds, provided technical support, capacity development, Ready to Use Therapeutic Food (RUTF) and medicine supplies through the existing district health service system, achieved an estimated 71% coverage of SAM treatment in 21 districts. SPHERE targets were met throughout the programme. However, in spite of great efforts, the scale up and capacity achieved could only be sustained post-intervention in four out of the 21 districts. This was largely due to lack of supplies of RUTF and medicines, limited national capacity to sustain supervision, lack of development partners to assist transition, and reverting to paid treatment services. The clear inference is a question about the efficiency of a humanitarian system that invests so much to build capacity only to see it fall away within months of the intervention ending; it also raises questions about how development actors view acute malnutrition and whether this falls within their remit.

In contrast, two articles about the scale up of programming for treatment of SAM in Ethiopia following the El Nino related drought in 2015 demonstrates the impressive capacity building that has taken place within the Ethiopian health system in recent years. An article by GOAL describes how the agency provided support to the Ministry of Health (MoH), enabling scale up from 22 to 70 woredas over an eight month period. GOAL characterised this as a 'light touch' programme, building on existing capacity and supporting elements such as human resources, logistic coordination, and supply pipelines. The scale up was considerably helped by robust early warning data, flexible donor funding and experienced in-country NGOs. It is also of note that GOAL managed to secure concomitant funding so that WASH and emergency seed provision could be included in the SAM treatment programme to make it more 'nutrition sensitive'. However, disappointingly, they could not secure funding for management of epidemics, scabies and diarrhoea. An article



Lucia Pantella, COOPI, DRC, 2016

by Getinet Babu, Alexandra Rutishauser-Perera, and Claudine Prudhon from Save the Children UK compared the 2011 and 2016 humanitarian nutrition responses in Ethiopia and found significant improvements with respect to government leadership, programme coverage and quality. There was also evidence of greater commitment by humanitarian partners to government-led humanitarian coordination mechanisms, with responses reinforcing existing community systems rather than direct implementation. Unsurprisingly, there are still many challenges including capacity limitations, inadequate reporting and weak referral pathways between sectors. Also, of note was the difficulty in ensuring pipelines of corn soya blend (CSB) as part of the moderate acute malnutrition (MAM) treatment scale up. This reflected in part delays in information flow but also the separate programming and agency responsibility for SAM and MAM treatment and resulting difficulties of ensuring programme coherence.

An article by Linda Shaker-Barbari, Pressila Derjany Khoueir and Dima Ousta from IOCC describes how in Lebanon in 2015, IOCC transitioned from direct implementation of SAM treatment, described in issue 47 of *Field Exchange*², to support for SAM treatment integrated within primary health centres (PHC), a move led by the Ministry of Public Health and in collaboration with UNICEF. IOCC focus switched to resource review, training and mentoring. A main challenge appeared to be the extra demands placed on health workers and the need for ongoing staff training to allow for staff turnover. RUTF is provided by UNICEF to the PHC services with subsidised consultation costs met by the family. IOCC are aware that quality assurance of staff and services informed by data on caseloads and outcomes are critically needed to determine the success of this transition.

Another article that relates to the connectivity of humanitarian and development programming describes a non-communicable disease (NCD) intervention amongst Syrian refugees

and refugee impacted populations in Jordan. The 2014 *Field Exchange* special issue on the response to the Syrian refugee crisis highlighted the enormous problem of NCDs amongst Syrian refugees in Lebanon, Jordan and Turkey, and the lack of attention of nutrition and food security actors to it. ENN argued that a disproportionate concern with acute malnutrition and infant and young child feeding (IYCF) detracted from areas like NCD management, typically viewed as a less urgent and more 'development' type problem. The IOCC programming in Jordan suggests a gradual shift in focus is beginning to occur; IOCC have been conducting community awareness sessions and risk factor screening for Syrian refugees and Syrian impacted Jordanian communities, leading to improved access to health care. Greater coordination around NCDs in Jordan is planned for 2017.

What all these articles have in common is an implicit recognition of the fact that different forms of malnutrition cannot just be viewed as 'humanitarian' or 'development' phenomena. They exist in both emergency and stable contexts and it is the responsibility of humanitarian and development actors (national and international) to provide sustainable treatment and prevention programmes. Agencies such as GOAL and IOCC that have a long term presence in country appear to adopt a longer term 'development' perspective which is built upon strong relationships with ministries, which result in programming that supports government agendas and national nutrition plans, and the capacity to implement these. However, as in the case of DRC, short term dependence on humanitarian funding appears to largely preclude the potential for sustaining gains made during an emergency.

¹ ENN (2016). Grand Bargain: Reform or business as usual? *Field Exchange* 53, November 2016. p51. www.ennonline.net/fex/53/grandbargain

² Linda Shaker Barbari, Dima Ousta and Farah Asfahani (2015). Institutionalising acute malnutrition treatment in Lebanon. *Field Exchange* 48, November 2014. p17. www.ennonline.net/fex/48/institutionalising

A second major theme in this issue relates to what is fashionably referred to as nutrition sensitive multi-sector programming, itself a topic of a recent special issue of *Field Exchange* (issue 51). A premise of the Lancet nutrition series (2008) was that even with scale up of nutrition specific interventions to 90% coverage, only 20% of stunting and 60% of wasting would be prevented. The residual caseload needed to be tackled by nutrition sensitive programming, i.e. interventions in sectors such as WASH (water, sanitation and hygiene), social protection, health and child protection, which have more explicit nutrition objectives and have adapted programme designs to enhance nutrition outcomes. The advent of the Scaling Up Nutrition (SUN) Movement (among others initiatives) has led to a marked focus on nutrition sensitive programming and global and country led efforts to scale up this type of intervention. Two articles in this issue focus on developments around this type of programming in Nepal and Uganda, implemented as part of national nutrition action plans.

The first, an article by Pradiumna Dahal, Anirudra Sharma and Stanley Chitekwe at UNICEF Nepal, describes the roll out of the Nepal 2012 multi-sector nutrition plan. This involved a restructuring of national, district and village level coordination structures, steering committees and technical working groups, and pilot programmes in selected districts with subsequent scale up being informed by lessons learned through these pilots. With an annual reduction rate of 3.3%, stunting has reduced from 57% in 2004 to 37% in 2014, although how much of this can be attributed to the MSNP 1 is debatable. A review of this roll out suggests that challenges remain with respect to capacity at district and lower levels. It may well be that this partly reflects the limited evidence base for what type of nutrition sensitive interventions work and in what context. The authors voice an urgent need to map interventions and resource allocations at district level to help identify gaps, while budget codes dedicated to nutrition are needed to help track spend. Development of MSNP 2 (2018-22) is underway, that will be greatly informed by a large government-led learning event in Nepal, supported by UNICEF,

planned for May 2017 – we look forward to featuring it in the next edition.

The second article summarises work completed by the USAID SPRING project, documenting the common successes and challenges of implementing the National Nutrition Action Plans in Nepal and Uganda at national and subnational levels. It involved a two year, mixed method longitudinal study. A common driver of change in both countries was multi-sector coordination involving a strong nutrition secretariat. Barriers included vertical coordination that often took precedence, high staff turnover and poor engagement with academia and the private sector. Remaining challenges included the need for stronger integration of the NNAP into existing local and national policies and work plans, and improved budgetary processes and monitoring and evaluation frameworks. Although both countries demonstrated increased prioritisation of nutrition across sectors and funding allocations, there was no evidence of increased spending. This article complements well a number of research articles we summarise, again drawing on SPRING Project learning, published in the Food and Nutrition Bulletin on this same topic. The series includes detailed analysis of multi-sector nutrition plans, architecture, budgeting and spend in Nepal, Uganda and Ethiopia. Two outstanding conclusions from this work are that although enabling factors like coordination platforms, policies and prioritisation of nutrition are evident in all three countries, there is, as yet, no evidence of increased nutrition spend as a result of these changes and no evidence of new or adapted types of nutrition programming.

ENN is increasingly interested in how multi-sector platforms and policies are playing out on the ground and in particular, what types of programme are being implemented as part of multi-sector nutrition sensitive programming roll out. We welcome contributions on this subject from our readers.

This issue of *Field Exchange* features a special section that summarises some of the highlights of an ACF hosted conference attended by ENN, that explored operational challenges and up-

take of research on prevention and treatment of SAM. We were delighted to work with ACF and the presenters to document some of the exchange and learning. An editorial by Myriam Ait Aissa at ACF argues that there is limited space for sharing learning on process implementation and research uptake, and none dedicated to the presentation of scientific results on nutrition in humanitarian settings. The ACF team captured the entire meeting on video – we share all the links. In pulling this special section together, one of the frustrations for all was the need to limit sharing results in print, for research destined for peer review publication. Whilst some journals have sped up the submission to publication time, others have not; this need to hold back doesn't sit comfortably with the need to 'fast track' learning and sharing.

One longstanding gap area in nutrition is how to assess and treat acute malnutrition outside the 6-59 month age group. The ongoing humanitarian situation in Syria, where there are conflict affected enclaves with poor access for humanitarian actors, has highlighted again the fact that in extreme cases, undernutrition can affect all age groups. As a result, UNICEF engaged Valid International to develop contextualised mid-upper arm circumference (MUAC) cut-off points for older children, adolescents and adults to meet critical assessment needs in Syria. This is part of a larger package of work that includes development of contextualised treatment protocols. We share the extensive review of relevant published work and grey literature that was undertaken and the cut-offs proposed. The process and considerations in arriving at the proposed criteria are transparent; preliminary discussions are underway for a follow-up study to test the criteria.

Finally, as we go to print, you should soon be able to enjoy some more 'live' *Field Exchange* contributions in the form of podcasts on our newly launched MediaHub, where our regional knowledge management coordinators have interviewed authors featured in this edition (Stanley Chitekwe from Nepal and Alain Georges Tchamba from DRC); thanks to them both for taking this extra time to talk with us. When *Field Exchange* first began, the use of images was – and remains – a defining characteristic, to bring experiences to life. As technology has leapt ahead, so have we (albeit rather tardily); aided and abetted by the ENN SUN project team, we now have the capacity to bring a whole new dimension to our experience capture and learning. Critically, interviews and podcasts allow us to examine, listen, hear and interpret experiences in a different way to the written word; we welcome your feedback on these new media developments. If you have ever wondered what *Field Exchange* editors actually look and sound like, then please visit our media hub where you can now hear us discussing key elements of this issue of *Field Exchange*. More will undoubtedly follow; visit www.enonline.net/mediahub to listen in.

Jeremy Shoham and Marie McGrath,
Co-Editors



Lucia Pantella, COOP, DRC, 2016



Lucia Pantella, COOPI, DRC, 2016

Children attending nutrition education sessions, Luiza

Alert and rapid response to nutritional crisis in DRC

By Alain Georges Tchamba



Alain Georges Tchamba is the Nutrition coordinator at Cooperazione Internazionale (COOPI) in the Democratic

Republic of the Congo, in post since 2010. He is responsible for the nutrition strategy and the design, implementation, monitoring and evaluation of nutrition activities.

The author acknowledges the support of ECHO, UNICEF and PRONANUT to the programme. Special thanks to Lucia Pantella, Nutrition Adviser for COOPI, for her contribution to the development of this article.

Media Hub

An interview (podcast) with Alain Georges Tchamba, by Ambarka Youssoufane, ENNs regional KM specialist based in Senegal, is available on the ENN MediaHub, www.ennonline.net/mediahub

Location: *Democratic Republic of Congo (DRC)*

What we know: While national prevalence of acute malnutrition has fallen in DRC, the severe acute malnutrition (SAM) caseload remains significant in many provinces, linked to chronic crisis and longstanding structural causes.

What this article adds: A three-year (2013-15) Rapid Response to Nutritional Crisis Project (RRCN) was implemented by COOPI, in collaboration with the government and UNICEF, to rapidly respond to surges in the SAM caseload. It involved six-month interventions (technical support, capacity-building, therapeutic food and medicine supplies) in response to confirmed alerts, integrated within existing health centres at district level. Geographical coverage in 21 districts increased considerably to 77%. Sphere targets were met and the project exceeded performance targets for numbers treated; providing RUTF supplies and free treatment were important success factors. Continuation of services post-intervention proved limited, despite government-backed exit plans from the outset; only four out of 21 health zones continued services. Lack of RUTF supplies and medicines; limited national agency capacity to sustain staff supervision; lack of development partners for transition of services; and reverting to paid treatment services proved key limiting factors to sustainable SAM treatment.

Background

For the past two decades, the nutrition situation in the Democratic Republic of Congo (DRC) has been critical. While national prevalence of global acute malnutrition (GAM) has fallen significantly from 16% in 2007 to 9% in 2014, there are areas of high wasting prevalence at provincial level, such as Maniema Province (22%), Bas-Congo (11%) and ranging from 3.5% to 9.8% in other provinces. About two million children aged 6 to 59 months are wasted (PRONAUT, 2015). An estimated 15% to 20% of severe cases are covered by the Integrated Management of Acute Malnutrition (IMAM) service available in 420 of 516 health zones (Ministère de la Santé Publique, 2016); IMAM is available in three to four out of 20 health centres in a given zone and service continuity may vary. There has been no evaluation of national SAM treatment coverage.

In order to better monitor the nutritional situation and promptly identify nutritional crises in the DRC, a system of nutritional surveillance, the Food Security and Early Warning system (SNSAP)¹ was piloted in 2009 and established by the National Nutrition Programme (PRONANUT) at the end of 2010. In this context, from 2009 to 2010, COOPI managed an emergency intervention, the Nutritional Pool in DRC (PUNC), funded by UNICEF. This involved a mechanism to detect and quickly respond to a nutritional crisis, with a three-month follow-up/intervention period. This proved very difficult in practice, given the limited intervention period to treat malnourished children without a strong exit strategy. To address these obstacles a new project, Scaling

up Nutrition, was developed in 2011, funded by UNICEF (UNICEF, 2013). This involved the use of SMART (Standardised Monitoring and Assessment of Relief and Transitions) surveys conducted by PRONANUT and an 18-month planned intervention period in all areas identified with a GAM prevalence >15%. However, this approach lacked the flexibility that characterised PUNC to react and scale up response to new nutritional crises.

Given this, the Rapid Response to Nutritional Crisis Project (RRCN) was established in 2013 by COOPI, funded by the Humanitarian Aid and Civil Protection of the European Commission (ECHO) through UNICEF, and has become part of the national health policy and strategy. Given that malnutrition is recurrent in several health areas, the RRCN integrates water, sanitation and hygiene (WASH) components (as reflected in the 'Wash in Nut' strategy that is national policy), and has a better exit strategy, which involves strengthening the capacity of the health authorities to treat and prevent SAM². The target population is acutely malnourished children aged six months to five years and adults (particularly pregnant and lactating women (PLW)).

This article describes how the RRCN interventions were put in place between 2013 and 2015 and their relevance, coverage, effectiveness and lessons learned.

¹ Surveillance Nutritionnelle, Sécurité Alimentaire et Alerte Précoce. For more information, visit: www.pronanut-rdc.org/telechargements/bulletin-snsap.html

² The RRCN does not extend to MAM treatment. Where there are RRCN interventions for SAM, there may be support from WFP for MAM treatment.

Table 1 Decision-making tree used in the SNSAP

Indicator	Threshold	Under control	To follow up	Warning
a) Nutritional indicators				
1. Proportion of children with MUAC < 125 mm	≥ 20%	If all the nutritional indicators directly collected are less than the threshold	If one of the nutritional indicators directly collected is greater than the threshold	If 4 out of 6 nutritional indicators directly collected are greater than the threshold
2. Proportion of children with nutritional oedema	≥ 5%			
3. Proportion of children with low birth weight < 2.5 kg	≥ 10%			
4. Increase in admissions of children with SAM in the health centres (OTFP, ITFP)	30% increase during the 3 months period			
5. Proportion of pregnant women with MUAC < 210 mm	≥ 20%			
6. Proportion of lactating women with MUAC < 210 mm	≥ 20%			
b) Triangulation indicators				
1. Disease outbreaks (measles, cholera, diarrhoea)		If all the triangulation indicators directly collected are less than the threshold	If one of the triangulation indicator directly collected is greater than the thresholds	If half of the triangulation indicators directly collected are greater than the thresholds
2. Data on crop production				
3. Data on prices				
4. Data for food consumption score surveys				
5. Data on WASH				

Method

The RRCN aims to quickly and effectively respond to a nutritional crisis in an area with prevalence of GAM>15% or where the prevalence of SAM is >5%. The interventions steps, outlined in Figure 1, are as follows:

Early alert

The PRONANUT uses monthly factsheets or quarterly bulletins to alert to nutritional crisis generated from SNSAP data. The SNSAP tracks nutritional indicators using quarterly routine data gathered from 776 sentinel sites at healthcare centres throughout all provinces (PRONAUT, 2016). The objective is not to get data statistically representative of one health area but to observe and record any change, identify trends and compare the results throughout the year. Nutrition data gathered are: mid-upper-arm circumference (MUAC) in children aged 6-59 months and PLW healthcare; child oedema; birth weight; and number of cases of malnutrition admitted to healthcare structures. These data are triangulated with indicators on food security (Food Consumption Score, Coping Strategy Index (CSI), food basket price), health (measles, cholera and diarrhoea outbreaks) and WASH. An alert is declared if the indicators reach the 'red' thresh-

old for three consecutive months, according to a decision tree (see Table 1). SNSAP bulletins analyse patterns, although seasonal trends have not been possible to identify.

Diagnosis

Alerts are confirmed by a SMART survey, carried out within one month of an alert.

Action

A Rapid Mechanism Coordination Committee (RMCC) is set up under the supervision of PRONANUT to act following alert confirmation. The operational response will begin four weeks after the alert is confirmed for a period of six months. This involves setting up or strengthening IMAM and promoting Infant and Young Child Feeding (IYCF).

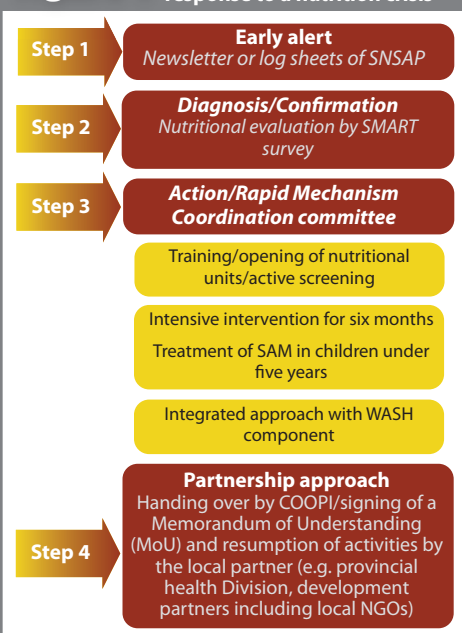
Multi-sector approach

The WASH component involves the distribution of WASH kits (antiseptic, bucket or jerrycan and soap) to the caregivers of malnourished children, hygiene messaging and improving WASH facilities in health centres (building toilets, constructing water sources and providing water storage kits).

Partnership approach

A partnership mechanism is developed between

Figure 1 Intervention steps in rapid response to a nutrition crisis



COOPI, PRONANUT and the Central Health Office Area (BCZ) to facilitate implementation (technical support, capacity-building) and hand-over of activities at the end of the intervention (within one month).

Relevance

Under the RRCN project, the management of SAM is integrated into health centre activities for the period of the intervention. The community component relies on community health workers (CHWs) and volunteers for screening, referral, outreach and home monitoring of cases or dropouts. The project has enabled mothers of malnourished children to monitor their children's nutritional status using simple, coloured MUAC plastic tapes.

Targeting based on GAM>15% and SAM >5%³ improved geographical coverage where it was most needed and extended services to remote health zones of the country (see Figure 2). Pre-RRCN, IMAM activities were largely concentrated in conflict-affected eastern provinces where insecurity and displacement were the main causes

³ Exceptions were made in two health zones where intervention decision was based on the SAM rates: 5.1% for Kyambi (GAM 10.4%) and Kambabaré (GAM 12.9%).

Figure 2 Prevalence of global acute malnutrition (GAM) in each intervention zone

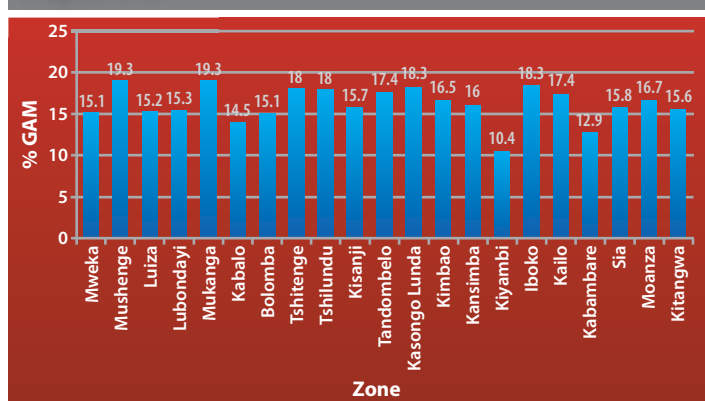


Figure 3 Number of RRCN interventions by province, zone and year

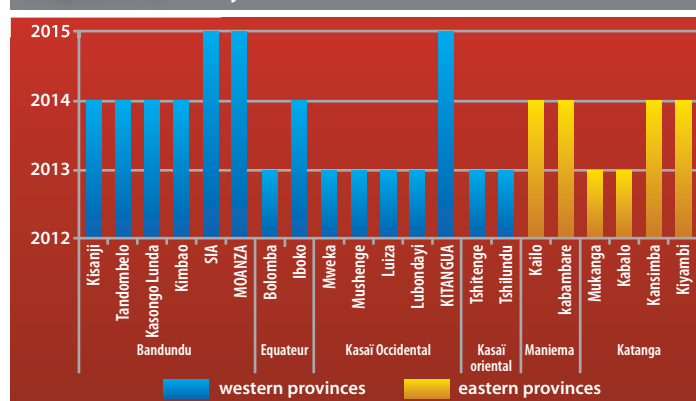
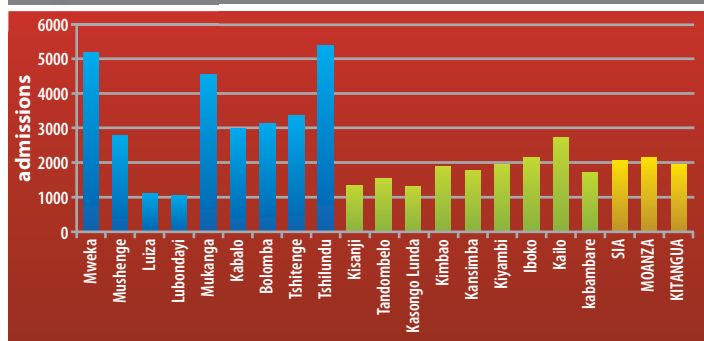


Figure 4 Number of SAM admissions per health zone



Breastfeeding mother screened for malnutrition, Stabilisation Centre, Luiza

Lucia Pantella, COOPI, DRC, 2016

of acute malnutrition. Since 2013, 15 of the 21 RRCN health zones (71%) are located in western provinces (Figure 3, blue); malnutrition here is a result of economic factors, combined with poor harvests, inadequate food, nutrition and hygiene practices, and chronic food insecurity. According to routine health zone data, 40% of under-fives child deaths in the health zone pre-RRCN were due to severe malnutrition; this fell to 2% during RRCN implementation, attributable to increased access to free treatment at health centres.

Coverage

During its three-year period, the RRCN project supported 21 health zones and enrolled 254 (out of 408) health centres to achieve 62% clinic coverage. None of these health posts had a structured IMAM programme or mobile units in place pre-RRCN. Implementation involved setup of 254 outpatient/community therapeutic feeding programmes (OTFPs) and 21 inpatient therapeutic feeding programmes (ITFPs). Outreach activities were put in place through 70 health posts and 45 mobile clinics to reach remote/difficult-to-access villages. Mobile units were connected to the closest fixed stations for monthly statistics and to coordinate activities. The minimum mobile team package comprised MUAC

screening, referral of severely malnourished children with medical complications to hospital, and treatment of severely malnourished children without medical complications. Uncomplicated case management is protocol-led, providing ready-to-use therapeutic food (RUTF) and antibiotics (amoxicillin), with fortnightly follow-up by the mobile clinic, and community worker follow-up at village level between clinic visits. As a result, each health zone improved to an average 77% geographical coverage.

Efficiency

Over the three-year project period, the cumulative number of children registered with SAM was 51,259 for an estimated target of 37,000 (see Figure 4), with a performance rate⁴ of 138% (29,240 in 2013, 16,003 in 2014 and 6,016 in 2015). The performance rate is higher than expected because children from other geographical areas beyond the project boundaries were also treated. Children from six months to five years represented 90% of the beneficiaries, while PLW comprised 10%. The recovery rate (97.7%), death rate (0.2%) and defaulter rate (2.1%) were well within Sphere targets (<75%, <10% and <15% respectively). The average length of stay in OTFP was 32 days.

A total of 1,315 healthcare providers (target 800) were trained on the IMAM approach, in addition to 1,676 community volunteers. The project also established 87 community support groups to promote IYCF and best WASH practice. WASH kits were distributed to all 20,376 malnourished children. The mean number of SAM admissions per health zone was 2,440 patients; three health zones had admissions of up to 4,000 (see Figure 4).

The decrease in admissions from one year to the next, reflected in Figure 5, is partly due to reduced funding that mainly concerned areas not affected by rapid-onset emergency or conflict; nutritional insecurity in the DRC is due more to structural causes and chronic crisis, so is not a priority for emergency funding. While the reduction in funding reduced the number of interventions from nine (2013, 2014) to three per year (2015), there was an increase in intervention coverage in each health zone from 60% in 2013-2014 to 80% in 2015. This was achieved by each RRCN covering more health centres within the health zone. There are several confirmed alerts in the DRC in 2016 without a response due to

funding limitations. Within the nutrition cluster, COOPI, together with RRCN partners, advocates for interventions in 'alert' areas to be implemented by other agencies.

Sustainability

Following the six-month RRCN intervention, it is necessary for another partner and funder to step in; most often, health zones will have other serious structural problems such as food insecurity or WASH problems that require external donor support. The Nutrition Cluster has played an advocacy role to try to secure longer-term intervention follow-up. However, only four health zones out of 21 have continued, with an average intervention of 18 months post RRCN (see Figure 6).

In general, healthcare workers gained technical skills to enable continuity of services. Promoting IYCF and WASH is a considered investment in longer-term practices. The health zone teams' participation and their support to the project contributed to its reach.

During the RRCN intervention, RUTF is sourced from UNICEF, who supplies it to COOPI; COOPI and BCZ manage the RUTF and distribute it to the health centres. A three-month stock of RUTF is left in the health zone at the end of the intervention; however lack of supplies has proved a barrier to sustaining services (see below).

Lessons learned

Key lessons learned over the three-year experience include the following:

Prioritising diagnosis, context analysis and flexibility

The RRCN project provided the means and tools to diagnose, analyse the intervention context and identify the most vulnerable communities. Although alert confirmation by SMART survey requires a significant investment in time and resources, we consider it an essential step. Effective functioning of the SNSAP mechanism is necessary to track the nutritional situation, with a SMART confirmation sensitivity of 80% (PRONAUT, 2015).

⁴ The performance rate is the proportion of treated children compared to the expected caseload of children with SAM (according to the SMART SAM rate prevalence, the population in the area and an incidence factor of 2.6% for six months) and coverage.

Figure 5 Number of admissions per year during RRCN intervention (2013-15)

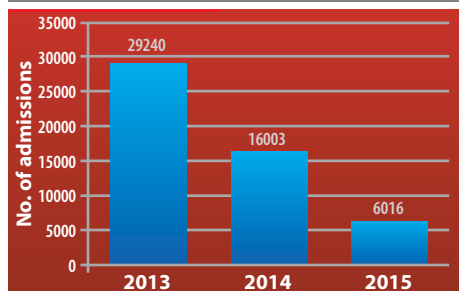
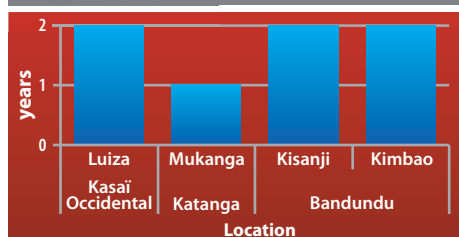


Figure 6 Duration of the project (years)



PRONANUT receives monthly data from the sentinel site but issues a quarterly bulletin; a time lag between data gathered and bulletin delays decision-making. As a result, in some cases an intervention took place months after the initial 'alert' warning. The time between data alert and bulletin alert must be reduced to enable a quicker response.

Increasing the timeliness of rapid response interventions

A SMART survey is organised and delivered within one month of an alert. The time between alert confirmation by SMART and start of activities should be reduced to less than four weeks (in practice this could happen quickly or take up to two months). The full cooperation of local-level MoH officials is a precondition to speed-up this process. More rapid response would be helped by an immediate green light to intervene from all authorities in the concerned areas; training of national and regional staff by PRONANUT; and provincial pre-positioning of RUTF stock (noting that capacities for stock management within PRONANUT are limited). Implementing partners should have a contingency stock of RUTF available and trained teams to minimise the planning and preparation phases, before field deployment. Once a project ends, COOPI staff are 'recycled'; they may be deployed to another nutrition project to provide support until required for a new RRCN intervention. Staff are reactivated one month before the start of a new project, for preparation.

Working on improved coverage, targeting and project monitoring

The availability of fixed services, mobile units and outposts has helped to cover most malnourished children; this strategy should be encouraged. There is still room for improvement on geographic coverage, ultimately aiming to target 100% of health areas in a health zone. The estimated caseload of RRCN intervention areas was 81,610 severely malnourished children; 51,259 cases were treated (estimated 63% coverage). No SQUEAC coverage surveys were conducted within the RRCN due to limited time.

Building the capacity of caregivers to screen using MUAC and distribution of MUAC tapes to the caregivers of admitted SAM children to facilitate nutritional surveillance in their home communities should be encouraged; this allows early detection and referral of malnourished children and empowers the caregivers.

State involvement, coordination and transition

Several state government institutions (PRONANUT, Provincial Health Division (DSP)) are directly or indirectly involved in managing the various crises under the RRCN. Cooperation with government actors is important to sustain efforts by building capacity. Despite transition agreements from the outset, the continuation of activities proved a major challenge. PRONANUT does not have the means to supervise nutrition activities at health-zone level. Once the intervention stops, lack of RUTF and medicines means that BCZ staff can only screen for cases and share data, without commitment to

treat. Similarly, there is a lack of resources to support BCZ staff transportation to supervise health centres and activities. Takeover of the intervention by development partners or by the DSP post-six month intervention has proved weak. The Nutrition Cluster has advocated for local NGOs as partners, but their lack of access to funds has prevented this.

Partnership with the MoH in some provinces has faced challenges during implementation. For example, administrative issues in signing MoUs delayed the start of activities for a month in some areas. Coordination between various MoH departments is not well developed; improvement could help establish closer relations with other activities or development programmes. The protracted nature of the crisis in the DRC requires longer-term interventions, necessitating greater synergies between humanitarian and development service providers.

Strengthening the health system

Good management and quality services require competent, committed, motivated and results-oriented people with effective leadership. It is therefore necessary to make relatively large investments in the capacity-building component for staff at all levels as part of the programme. Change in behaviour and practices of health centre staff requires more than simple transfer of skills; it requires improvement in the working conditions and salaries of health personnel. It is also necessary to expand the network to include partners from non-government sectors (local NGOs) to access further resources and expertise. Promoting good IYCF and WASH practices through community support groups can improve beneficiary knowledge and attitude change; this approach should be expanded in all areas of intervention.

Improvement of accessibility to health services

Free health and nutrition services for all children and mothers affected by acute malnutrition was a strength of the project; usually patients must pay for malnutrition consultation and care. RUTF is commonly sold (although it should be provided for free) in order to cover the costs of the health centres. Ensuring free transportation of referred children (with accompanying persons) and feeding during their staying in the ITPP helped mothers to accept the referral of their child. Maintaining free services for malnourished children after the end of the project is a key challenge to sustainability.

Consideration of project logistics

The logistical assessments conducted within RRCN interventions provide a critical understanding of intervention areas in terms of accessibility, transportation, communication and storage needs that inform how to reduce the time gap between the alert and start of activities. Accessibility problems during RRCN implementation created delays in the supply of inputs, causing stock-outs of RUTF. Logistics assessments should be conducted before field deployment of nutrition staff, with a final evaluation to identify bottlenecks and lessons learnt.

The challenge to ensure follow-up interventions

Funding agencies, government institutions and civil society actors involved in this project must build links between the rapid response mechanism and longer-term interventions. Development programmes that commonly focus on reducing malnutrition by addressing its underlying causes can strengthen and enhance livelihoods in a sustainable manner. In this context, the RMCC plays an important advocacy role with the actors involved in health-system strengthening programmes in order to include and integrate IMAM in the minimum package of activities.

One of the key challenges to continuity of nutritional activities is the supply of therapeutic nutritional inputs (RUTF). Health zones usually do not have RUTF supplies when there is no nutrition intervention.

The long distances between villages and the lack of sufficient high-calibre staff hinder access to health services by the communities. High health centre staff turnover undermines continuity of malnutrition treatment, while extreme poverty also forces staff to undertake essential livelihood activities rather than be permanently deployed in health facilities.

The absence of roads and poor state road infrastructure generate high logistics costs, complicate the movements of field teams and make their missions strenuous; most RRCN interventions are located in remote and isolated areas.

Conclusion

The RRCN has proved a flexible and responsive short-term intervention to treat acute malnutrition and save lives; admissions and surveillance data show the caseload of malnourished children has decreased significantly in the targeted areas. Providing RUTF supplies and access to free treatment were important success factors. Linking the rapid responses to longer-term interventions has had little success, impeded by lack of RUTF supplies and medicines; limited national-agency capacity to sustain supervision; lack of development partners for transition, and discontinuation of free treatment. Establishing the role of development and government agencies in providing longer-term interventions to build and sustain health service capacity and address the underlying causes of malnutrition is critical to reduce nutrition insecurity in the long run.

For more information, contact:

Lucia Pantella nutrition@coopi.org,
Alain Tchamba nutrition.rdc@coopi.org

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Developing a mobile health app to manage acute malnutrition: a five-country experience

By Tine Frank, Emily Keane, Natalie Roschnik, Colleen Emary, Melani O'Leary and Laura Snyder

Tine Frank is a consultant engaged by Save the Children with funding from DIFD through the Transform Nutrition research consortium.

Emily Keane is Nutrition Advisor with Save the Children.

Natalie Roschnik is Senior Research & Impact Advisor with Save the Children.

Colleen Emary is Senior Emergency Nutrition Advisor, World Vision.

Melani O'Leary is Regional Health and Nutrition Technical Specialist, World Vision.

Laura Snyder is Design & Development Manager with World Vision.

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Location: *Afghanistan, Chad, Kenya, Mali and Niger*

What we know: Mobile device-based (mHealth) apps can improve the ability of frontline health workers to deliver effective treatment, supply chain management and reporting.

What this article adds: Between 2013 and 2016, World Vision, Save the Children and International Medical Corps (IMC) collaborated in the development and pilot of an mHealth app to improve CMAM treatment, reporting, monitoring and supply management in Afghanistan, Chad, Kenya, Mali and Niger. The pilot involved a public-private partnership with a software company, Dimagi. Overall, ministry engagement was good, although project continuity remains a challenge. Problems that significantly impacted in rollout plans included security issues limiting on-site training and technical support; complexities in contextualising country protocols; software bugs; and power and network coverage difficulties. With time, practice and support, health workers accepted the app and report many benefits for quality case management, although its use remains more time-consuming than the paper-based system. Several priorities have been identified for future rollout, scale-up and integration with national information systems and child health platforms. Simplified CMAM protocols and addition of the reporting feature would save time. An impact evaluation of the Kenya programme is due this year.

Context

Community-based management of acute malnutrition (CMAM) is a proven high-impact and cost-effective approach in the treatment of acute malnutrition. However, its success can be limited by a number of factors, including lack of protocol adherence by health workers and inaccurate record keeping. Limitations in paper-based systems, typically used to support referrals, make it difficult to track cases through the different levels of treatment to recovery and discharge. Missing or poor quality information that is not accessible to decision makers within a reasonable timeframe hampers surveillance, logistics management, alerts to stock-outs and response to surges in caseloads.

There is strong evidence that mobile device-based (mHealth) apps can improve frontline health workers' ability to apply treatment protocols more

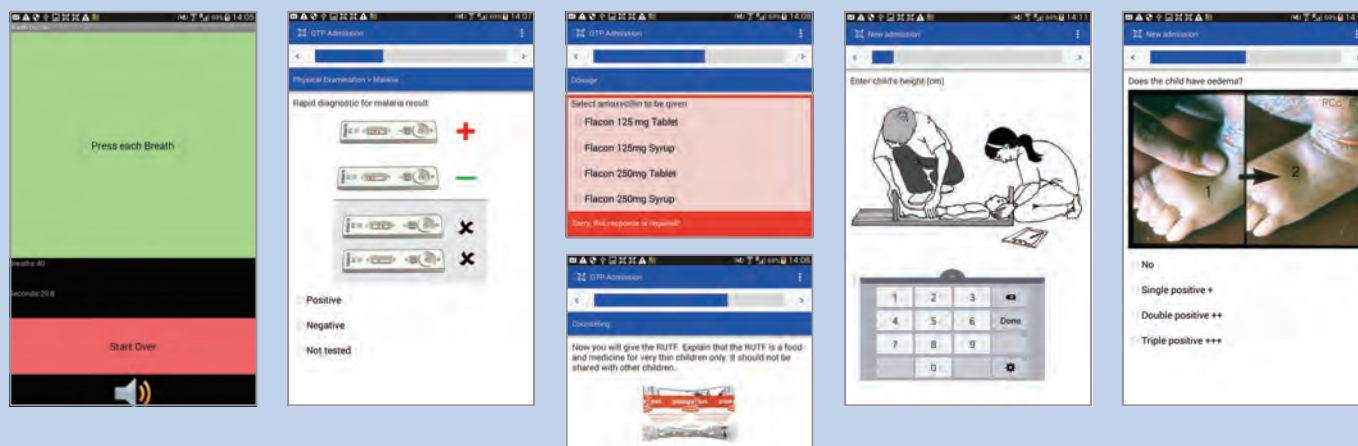
effectively and to improve the provision of supply chain management. Currently, the majority of frontline health workers supporting CMAM programmes are trained in standardised protocols but do not have on-site quality-assurance supervision or job aids to support protocol adherence and accurate treatment. Tracking and site-monitoring systems are paper-based and subject to error and misreporting. An innovation that secures a dynamic link between frontline patient treatment data with programme performance, reporting and stock management has the potential to dramatically improve monitoring, evaluation and real-time decision making for CMAM. Effective job aids and a performance-monitoring system are needed to improve the quality of CMAM programmes globally.

In 2013, World Vision (WV) initiated the development of a mobile phone-based application

A health worker using the CMAM app in Ouaddai region, Chad

How the mHealth app works

The mHealth app provides health workers with simple, step-by-step guidance to help them assess, treat or refer children visiting the CMAM programme. Steps cannot be skipped. The app is built on the open source ODK (Open Data Kit) platform, which uses a touch swiping function to take health workers through the steps, remind them of the treatment protocol and counselling messages and calculate z-scores and numbers of RUTF sachets indicated. It also records the child's information for follow-up and uploads to the 'cloud' for immediate access at district and national level.



for CMAM. Since then, the CMAM mHealth app has been piloted in five countries: Niger, Afghanistan, Mali, Chad and Kenya. This article shares experiences and lessons learned through interviews with World Vision, Save the Children and Dimagi staff at country and headquarter level. It draws on a learning paper to be published later this year which gathers lessons learned from developing and rolling out the app in these five countries with considerations for scale-up and future mobile health projects.

The CMAM mHealth project

The first CMAM mHealth app was developed in Chad in 2013, based on Chad national protocols with support from WV nutrition technical specialists. A global call for partners by WV secured the engagement of Save the Children (SC) and International Medical Corps (IMC). Five months were spent testing and refining the prototype app. Funded by the USAID Office for Disaster Assistance (OFDA), the app was subsequently piloted in established CMAM

programmes in Chad, Kenya, Mali and Niger by WV, SC and IMC, working closely with technical software partner Dimagi and local ministries. In November 2014, WV Afghanistan introduced the app into a Global Affairs Canada-funded Maternal and Under 5 Nutrition and Child Health (MUNCH) project. In 2015, SC added an impact evaluation to the Kenya pilot via the DIFD-funded, IFPRI-led Transform Nutrition research consortium to evaluate the impact of the app on the quality of CMAM reporting and care. The results of the impact evaluation will be available in late 2017.

The overall objective of the mHealth application was to improve CMAM treatment, reporting, monitoring and supply management for improved quality of care for children suffering from acute malnutrition. The app has a dual purpose: first to improve the quality of CMAM programme delivery, as health workers are more likely to correctly follow the treatment protocol, assess a child's nutritional and medical status

more accurately, provide the correct number of ready-to-use therapeutic food (RUTF) sachets, routine medications and identify defaulters or non-responders; and second, to provide more accurate and timely data for district-level CMAM management and decision making.

Public-private partnership

Over the last nine years, WV has collaborated with the Bill and Melinda Gates Foundation, Grameen Foundation and Dimagi in a public-private partnership to develop a common set of apps built within the MoTECH Suite. Gates Foundation and Grameen Foundation provided the funds and strategic direction, WV was the lead implementing partner and Dimagi the software partner responsible for developing and testing the app prototype. Dimagi is a US-based software social enterprise that develops technologies to improve service delivery in under-served communities. Its technology platform, CommCare (www.commcarehq.org), is the most widely adopted mobile platform for low-resources settings and is used by WV, the World Health Organization (WHO) and others in over 50 countries. CommCare can manage and monitor health records of children and pregnant mothers; support diagnosis and treatment; collect real-time data; disseminate audio and pictorial behaviour-change communication messages; and refer complicated cases. The CMAM prototype app was developed under the WV-Dimagi partnership and contextualised to each country. As such, Dimagi was the natural choice of technical partner for the CMAM mHealth project.

Adapting the app to each country

The contextualisation of the app in each country began with a rapid assessment of mobile networks, technology coverage and usage levels in the CMAM project area and intended pilot-testing site. Information was also collected on existing CMAM data management practices and processes. This data was used to inform project design and as the basis for end-of-project evaluation, reflection and learning.



The app was first contextualised in Niger, which required French translation, adaptation to the Ministry of Health (MoH) national protocol for the management of acute malnutrition, addition of local multi-media (visual and audio), discussion with mobile network operators, adaptation of project monitoring and evaluation tools, testing with users and re-refining the app. Much of this was done remotely with in-country visits by Dimagi. District health staff were engaged in the testing process. A similar approach was used in all five countries, with context-specific variations where necessary.

Rollout

In preparation for rollout, a training of trainers was conducted jointly by Dimagi with the implementing non-governmental organisation (NGO) (WV, SC or IMC), followed by a training of health workers and field observations. After deployment, implementing partner staff provided ongoing support and supervision. Regular user observations were undertaken and project staff monitored app use through the server, recording issues and prompting app updates from Dimagi or reminders to health workers to upload data.

The number of health facilities provided with the mobile app ranged from eight in Niger to 50 in Afghanistan; the number of health workers trained ranged from 20 in Niger to 52 in Afghanistan. Trainings and rollout were staggered, with the first taking place in Niger in May 2014, followed by Afghanistan in November 2014, Mali and Chad in February 2015 and Kenya in October 2015. Project close-out was staggered, with Chad ending in June 2016, followed by Mali and Afghanistan in September 2016, Niger in October 2016 and Kenya in December 2016.

Assumptions and compromises

It was assumed at project design stage that the app would be fully developed in Niger before being adapted to other countries in a phased approach (country by country) and the design and reporting function would be added once the app was deployed and in use. Dimagi were expected to provide at least two in-country, on-site support visits to develop and test the app, then return for the trainings of trainers and end users. A WV Africa Regional Nutritionist would provide ongoing support and supervision.

In practice, there were compromises. Security issues in Chad and Afghanistan, along with the Ebola threat in Mali, restricted travel; visits were largely replaced by workshops in Senegal (Mali and Chad) and Dubai (Afghanistan), along with remote technical support. Adapting the app to national protocols took longer than anticipated, which had considerable impact on software programming; these delays subsequently affected the scheduled availability of the Dimagi team. This also meant that country introduction occurred almost simultaneously, rather than in a phased approach, limiting time for lesson learning and adaptation between pilots. The majority of technical support was remote rather than on-site. As a result, the reporting functionality was not completed for West African

countries, limiting the ability to assess impact of the app on CMAM performance. The reporting function was developed for the final Kenya pilot; looking ahead, this will serve as a template for others.

Key experiences and lessons learned

Health worker acceptance of the app

In most countries, health workers were initially resistant to using the new mobile app and reluctant to give up the paper-based reporting system. They did not trust the app's capacity to store and send data via the 'cloud' and worried that their data would be lost. The app also 'forced' health workers to follow the treatment protocol, which took more time. Health workers would previously take short cuts, dropping certain steps like the appetite test and health and nutrition counselling. This was no longer possible with the app, which some found tedious and so would revert back to the paper-based registers. In some countries, health workers were still required by the MoH and their supervisors to complete the paper registers (due to the reporting function not being completed on time), which in effect doubled their workload.

With time, practice and support, health workers in all five countries learned to use and trust the app and saw many benefits, including better quality information; stronger communication with remote supervisors; valued use of pictures and counselling messages to communicate with caregivers; reduced need to refer to guidance manuals (Afghanistan); reduced errors and improved quality of care (Mali); reduced conflict between healthcare workers and caregivers over treatment (Chad); and improved case management, including minimising defaulting (Kenya). Barriers to app use included unfixed bugs, network issues and power problems (e.g. inadequate battery life and non-functioning solar chargers were the main challenge in Chad). Independent of the mHealth app, the lack of a consistent supply of nutritional commodities was a constant challenge; health facilities frequently ran out of stock of supplies and essential drugs, leading to a high default rate.

Technology landscape

Procurement of suitable quality devices, as well as reliable network operators and data packages within budget, was a challenge. Battery-life issues, screen size, phone inauthenticity, network speed and coverage all had a negative impact on health workers' motivation and uptake of the app. Key country challenges included purchase of fake phones with compromised functionality (Niger); poor network coverage, problems with solar chargers requiring health workers to travel to upload data, increasing time and travel costs, data upload requirements exceeding data bundle capacity; personal use of phone data (Afghanistan); and low network coverage that delayed data submission by months (Kenya).

Local government involvement

The degree and nature of local government involvement varied by country. In Mali, the MoH

(ANTIM/Agence Nationale de Télésanté et d'Informatique Médicale) provided considerable expertise and support and was involved in all the stages of the pilot, which led to considerable buy-in and commitment in the regulation and acceptance of the app. However, ensuring continuity of the Mali CMAM mHealth project was a challenge, since MoH prioritises resources for MoH rather than those developed externally. In Chad, district health officials were not sufficiently involved during implementation. This limited MoH leadership in moving the mHealth project forward and linking it to the MoH health information system. In Afghanistan, regional and national MoH officials were involved from the beginning and have showed interest in scaling up mHealth interventions (it is seen as cost effective, facilitating easy collection of accessible data). The decentralised health system in Kenya, coupled with high workloads and competing demands, meant buy-in took longer than anticipated. In particular, the time and motivations needed to impact health workers' behaviour change were not properly understood and accounted for. However, the MoH in Kenya has proved to become a particularly strong partner in the project.

Adapting to national systems

In Chad, there were significant delays in contextualisation: terminology was not easily understood by users and the need to translate to local languages was beyond the scope of the project. In Kenya, use of the app was not authorised until the summary data report was aligned to the country health information system, which caused further delays.

Software development, testing and technical support

Delays in sorting software and programming issues had a negative impact on users and project



A community health worker completes the paperwork system

staff in all countries. For example, the Kenya app was developed based on the Niger version; this process took four months, largely because the Kenya protocol and case management guideline differs considerably from that of Niger. The Kenya app experienced consistent bugs throughout the project due to programming issues, which had a marked influence on user confidence.

Pilot country selection

The contexts in which this type of mHealth innovation is most needed tend to be complex and challenging environments. In Mali and Kenya, high turnover of health facility staff meant continuous training was needed to ensure uptake among new staff. In Afghanistan, the political environment, weather conditions and security concerns meant that Dimagi was not able to provide onsite support, delaying mHealth activities by over one year. In Chad, there was insufficient budget to fund MoH officials to join field visits and trainings, limiting buy-in and supervision capacity. All project country teams were understaffed. Due to initial delays in the project, the country phases were mostly conducted almost simultaneously, resulting in deployment of an app that had not been sufficiently tested, causing frustration among both users and project teams.

Health worker protocol adherence

The use of the app seems to have improved adherence to the treatment protocol and the quality of care compared to the paper-based job aids and reporting tools. However, as the general treatment protocols for CMAM are complex and time-consuming, and with the app being based on standard national protocols, the app itself was relatively complex and data-heavy. As outlined above, the app was more time-consuming as steps could not be skipped and some health workers were using dual systems (electronic and standard government paper forms) to meet data reporting requirements.

A number of developments took place in countries to improve adherence. In Niger, phones were blocked for personal use from the outset to minimise wasting of data, battery and memory card; this was well accepted. In Kenya, a WhatsApp group was created for all users to interact with each other and the project team and share experiences; there was a marked effect on compliance and usage. In Afghanistan, users who had lower competency scores in post-training assessments were monitored and supported.

Recommendations

The lessons from the CMAM mHealth project around planning, implementation and evaluation are valuable for anyone considering future app development and adaptation and for scaling up by MOH and other partners. Recommendations include:

When introducing a new mHealth app to health workers, particularly in remote locations, significant on-site support is necessary for both health workers and supervisors. This has budget implications for fuel and travel costs to remote

clinics. Rollout should only be considered once an app has been fully tested in non-remote health facilities, all major bugs have been fixed and the system for recharging the devices has been fully tested. Rapid assessment information on networks and power should be used more strategically to develop contingency plans in the event of failure. These should be jointly developed and agreed to with MoH partners, as well as mobile network operators.

Health workers are more likely to include the app in their daily routines where it is incorporated into national policies and strategies. To enable this, it is critical to plan and budget for local and national government engagement and uptake from the start. This includes regular meetings with key stakeholders to plan, discuss progress and generate recommendations; field visits; and clear communication of the relevance of the mHealth app to support national strategies and goals. Issues such as stock-outs of nutrition supplies should be discussed in relation to the app functionality. For scalability, the app should be linked to a wider continuum of care, related to integrated maternal and child health services.

It is imperative that the technology partner provides ongoing support for troubleshooting, bug fixing and capacity building. The ideal technology partner would provide considerable in-country presence and support, either through country representatives or frequent site visits, to build national capacity, especially regarding capacity to fix bugs and update the app. Pre-field testing, a workshop attended by all stakeholders and users could be used to test the app and identify errors and inconsistencies. In challenging contexts, significant flexibility on timelines, budgets and tasks are inevitably needed.

The feasibility of piloting projects in challenging contexts should be examined closely to resource and adapt the deployment accordingly. It is worth considering pilots in lower-risk, more stable and accessible areas/countries with more reliable infrastructure. This would minimise delays, frustrations and limited uptake caused by lack of network, electricity and access for sufficient support supervision. Once app development and testing is at a satisfactory level and training

and support requirements have been identified, a more stable version of the app could be deployed to high risk/poor infrastructure areas.

There is a need to review and better understand what is feasible in terms of capacity and time for health workers in low-resource settings, with high patient caseloads (and resulting long waiting times for children and caregivers). Simplification of management protocols can be reflected in the app, which can help accuracy in case management and, with reporting functionality developed, could save health worker reporting time.

Conclusions and looking ahead

The collaboration between the implementing partners across the different project countries has been highly successful and important to the project, with mutual sharing and learning having a positive effect on all implementation sites. Based on this experience, the mHealth app has great potential. For scale-up, several priorities have been identified, including completing reporting functionality and developing stock monitoring functions (Mali); expanded use of the application in current user countries (national deployment in Afghanistan); linking the application to HMIS systems (planned for Mali) and national mHealth platforms; further capacity building to support uptake and use of application; exploration of scale-up opportunities with national and county ministries (Kenya); linking multiple child health-focused apps on an integrated platform (e.g. GMP, iCCM); and connecting the application to other platforms (e.g. CMAM Report, World Vision CMAM database).

For more information, contact: Emily Keane, email: e.keane@savethechildren.org.uk or Colleen Emary, email: colleen_emory@worldvision.ca

To see a short video clip on the experiences of staff in Wajir, Kenya, visit: <https://kenya.savethechildren.net/media/videos#>

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A health worker using the CMAM app in Bitkine, Chad

Cooking demonstration as a part of IYCF session by Health Extension Worker, Tigray region

CMAM scale-up: experience from Ethiopia's El Niño response 2016

By Christoph Andert, Zeine Muzeiyin, Hatty Barthorp and Sinead O'Mahony



Christoph Andert is a Nutrition Advisor at GOAL's HQ. For the past 12 years he has worked mainly on emergency nutrition, including CMAM, IYCF and M&E systems in Africa and Asia.



Zeine Muzeiyin has worked in nutrition for the last 11 years. Before he joined GOAL Ethiopia, he worked with Concern Worldwide in West Darfur, Sudan and has extensive field experience. Currently he is Head of Nutrition for GOAL Ethiopia, leading the CMAM response.



Hatty Barthorp is a Global Nutrition Advisor at GOAL's HQ. She has been working on emergency, transitional and development programmes for 14 years.



Sinead O'Mahony is a Nutrition Advisor at GOAL's HQ. She has both a research and an operational background and been working in the field of health, research and humanitarian aid for seven years.

The authors extend thanks to the whole GOAL Ethiopia team who helped make this scale-up happen. Further thanks to the Ethiopia Ministry of Health, the Emergency Nutrition Coordination Unit and GOAL's sub-grantees. Finally, GOAL gratefully acknowledges OFDA, as well as Irish Aid, ECHO and UNOCHA, for funding the CMAM scale-up in Ethiopia.

Location: Ethiopia

What we know: Periodic severe food insecurity and consequent surge in acute malnutrition prevalence persists in Ethiopia. An early warning system operates at district level to trigger response.

What this article adds: In 2015, half of Ethiopia's districts (woreda) were classified as hotspots, requiring acute malnutrition treatment intervention. In response, GOAL scaled up operational support to the Ministry of Health from 22 woredas (862 health facilities within inpatient/outpatient treatment services) to 70 woredas (1,900 health facilities covered) over eight months. National authorities played a key lead role in identifying needs and coordinating response. GOAL applied its established model of minimalist technical and operational support, coupled with redeployment of experienced staff to new woredas and positioning of recently trained staff to established facilities. Challenges related to human resources, logistics, coordination, funding and supply pipelines were largely overcome. A Quality Assurance Framework was developed to address service-quality issues identified in the initial phase of scale-up. Key to successful scale-up were robust early warning data and situational analysis, well coordinated response, flexible donor funding, established systems, services and capacity, and experienced in-country NGOs who could respond quickly and innovatively.

Introduction

Food insecurity is a persistent feature of the humanitarian landscape in Ethiopia, with recurrent nutrition emergencies every couple of years over the last decades. The latest one, considered by some the most severe since the 1984 famine, resulted from two consecutive crop failures¹ in 2015, triggered by the El Niño phenomenon, that decreased overall crop production by 50-90%. Initial government estimates of people in need of emergency food assistance for 2016 were set at 4.5 million in August 2015 but were revised to 8.2 million two months later, and finally to 10.2 million by the end of 2015. Updated figures in mid-2016 estimated 9.7 million people were still in need. Acute malnutrition increased countrywide, with more than half (443) of all districts (known as 'woredas' in

Ethiopia) being classified as hotspot woreda² (Priority 1 to 3) by March 2016, which would trigger selective feeding interventions. This was the highest number of woredas classified as hotspot since 2009. In total, 420,000 children under 5 years of age with severe acute malnutrition (SAM) and 2.5 million children with moderate acute malnutrition (MAM) were expected to require treatment in 2016.

¹ Including the Kremt (long) rains, which normally feed 80-85% of the country.

² Hotspot woreda classification has been derived using multi-sector indicators, including health and nutrition, agriculture, market, water, and education. It is agreed at zonal, regional and federal levels. A hotspot matrix is often used as a proxy for the Integrated Food Security Phase Classification (IPC), whereas Priority 1 is equivalent to 'Humanitarian Emergency'; Priority 2 indicates 'Acute Food and Livelihood Crisis'; and Priority 3 indicates 'Moderate Food Insecure or Chronically Food Insecure'.

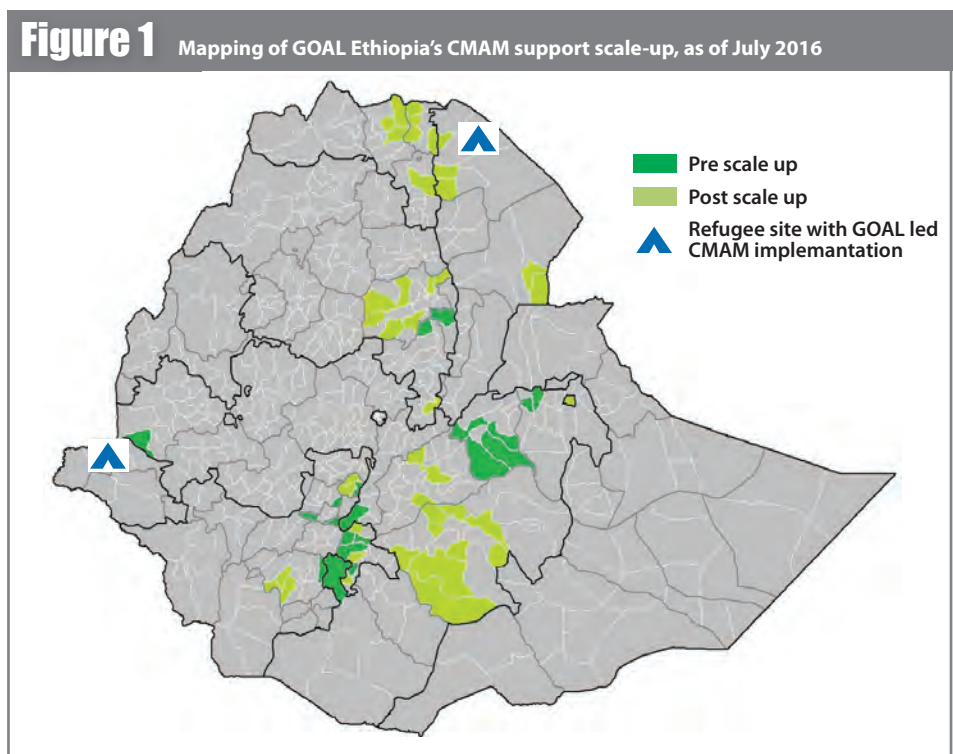
Anteneh Tadele, GOAL, Ethiopia, 2016

In November 2015, GOAL Ethiopia was operational in 22 woredas, supporting the Ministry of Health (MoH) to provide community-based treatment of acute malnutrition (CMAM) services across approximately 862 health facilities with inpatient and outpatient therapeutic care. A rapid scale-up increased GOAL's operational support to 70 woredas by July 2016 with around 1,900 health facilities covered – the biggest ever number supported for CMAM by GOAL in Ethiopia (see Figures 1 and 2). With this, GOAL covered 15.8% (70 out of 443) of all hotspot-classified woredas in Ethiopia in 2016. This scale-up led to several operational and service-quality challenges, solutions and lessons learnt.

GOAL's CMAM support model for Ethiopia

GOAL started nutrition programming during the 1984 famine in Ethiopia. The CMAM approach (formerly called Community Therapeutic Care (CTC)) was first used by GOAL in Ethiopia in 2005. Programming has since evolved from direct international non-governmental organisation (INGO) implementation to support of government staff to run CMAM in MoH health facilities.

With this support model, GOAL typically sets up a woreda field office and provides three technical staff (one Senior CMAM Programme Manager and two CMAM nurses) and several support staff (one administrator/finance/logistics staff, four guards, one cleaner and drivers) per woreda to facilitate operations. Technical staff provide mentoring and on-the-job training to



the government health staff in hospitals, health centres and health posts, as well as to facility-based health extension workers (HEWs) and health workers (HWs) in that woreda, to run CMAM services for acutely malnourished children. Drugs and ready-to-use therapeutic foods (RUTF) are supplied to the MoH by UNICEF. Movement plans are coordinated so that technical

staff visit all health facilities (usually around 30 in each woreda), timed with Outpatient Therapeutic Programme (OTP) follow-up days, and conduct monthly joint monitoring visits with the woreda health office to specific sites. A checklist is used to assess in-service technical ability of MoH health facility staff on anthropometric measurements, admission and discharge criteria, medical treatment and M&E, as well as staff attendance, stock management and general management. This checklist is used to monitor treatment quality and score health facilities; results are used to prioritise certain facilities for more frequent visits. GOAL's woreda field offices are supported by regional offices with one Regional Programme Manager, one Assistant Regional Programme Manager, one Logistics Coordinator and one Finance/Administrator in each office. At head office in Addis Ababa, the nutrition team is led by the Nutrition Coordinator, who oversees a team of four staff: one Nutrition Programme Manager, one Roving Nutrition Programme Manager and two Partner Support

Figure 2 Illustration of the scale-up of MoH CMAM woredas supported by GOAL



³ The funding amount and modalities of the CMAM intervention were agreed with the donors but operational areas were not predetermined.

Table 1 CMAM scale-up in numbers

	Nov 2015	Dec 2015	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016
No. of woredas	22	24	33	39	43	51	57	66	70	70	70	70	54	40
No. of health facilities	862	811	1,094	1,120	1,236	1,454	1,540	1,802	1,876	1,876	1,876	1,876	1,450	1,269
No. of GOAL staff ^a	114	136	133	136	160	186	205	231	231	243	247	249	249	249
Adm. Outpatient care	2,002	2,102	2,200	1,774	2,568	3,040	3,040	3,656	3,213	3,202	2,728	2,516	1,946	1,561
Adm. Inpatient care	252	215	191	200	270	364	394	441	430	387	358	275	144	168
No. Recovered from SAM ^b	2,520	2,546	2,373	1,915	2,698	2,857	3,003	3,771	3,681	3,816	3,502	3,052	2,134	1,875
Recovery rate SAM	98.40%	98.60%	99.40%	97.00%	97.60%	99.10%	98.70%	98.10%	98.70%	98.40%	98.70%	98.60%	96.50%	98.00%

^a Technical and operational support staff to facilitate the scale-up.

^b Number recovered from SAM might be higher than monthly admissions as beneficiaries were already in the programme before November 2015.

Officers for sub-grants. Using this model, GOAL would usually support MoH-led CMAM in around 22 woredas (approx. 862 health facilities), involving 66 woreda-level technical staff in any given year. An exit strategy for every supported woreda exists whereby GOAL stay for 9-12 months before rotating to a new site that requires capacity-building support.

Scale-up process

Operationally, the scale-up progressed in a very organised fashion over a timeframe of eight months. Flexible funding³ in most part from OFDA and to a lesser degree from Irish Aid, ECHO and UN OCHA allowed GOAL to intervene in any upcoming hotspot Priority 1 woreda. The Emergency Nutrition Coordination Unit (ENCU)⁴ invited actors to cover any newly identified hotspot Priority 1 woreda unsupported by an NGO partner. In general, the National Disaster Risk Management Commission (NDRMC), jointly with Federal-ENCU, play the key role in monitoring the food security and nutrition situation in Ethiopia and coordinating actors for an organised humanitarian response based on the woreda hotspot classification. Newly identified and assigned woredas by the ENCU were pre-assessed by GOAL's roving nutrition technical staff from the country office in Addis Ababa. Support needs and gaps were identified and necessary agreements and permissions for GOAL to support the MoH for CMAM were arranged. All information was documented in woreda assessment reports to guide the setup of the operation. A new field office was then established by GOAL's logistics team once agreements have been signed. Local properties rented in the woreda centre included office space for technical and support staff and living space for relocated or newly hired GOAL staff, as well as storage space for corn-soya blend (CSB)/oil and RUTF.

Prior to the 2015-16 scale-up, GOAL operated a CMAM Trainee Nurse programme; on grad-

uation, clinical staff undertook a two-week, theory-based induction and condensed training at head office. Thereafter they were given on-the-job training at woreda level by a senior nurse for six months. This system worked well for a number of years, providing a qualified cadre of staff for CMAM support programming. During the scale-up itself, adequate staffing was achieved by relocating long-standing and experienced GOAL CMAM support staff from the 22 existing woredas supported by GOAL to new woredas. Support would be led in new woredas by one experienced CMAM staff (normally the Senior CMAM Programme Manager) accompanied by a newly recruited CMAM trainee. Gaps left by these relocations in the 22 pre-existing woredas were filled through the promotion of the best-performing and most experienced CMAM nurses to woreda programme manager positions, and newly recruited nurses who had completed the six month trainee programme were brought in to fill CMAM nurse roles. All new woredas were pre-assessed by roving nutrition programme managers to identify support needs and gaps and arrange the necessary agreements/permissions for GOAL to support the MoH for CMAM. Upon signature of agreements, a new field office was established and support operations commenced.

In line with the huge increase in the number of field-level support sites, GOAL Ethiopia also significantly increased its technical and operational support staff at regional and country office levels (see Figure 3). Six regional offices were established and staffed with Regional Programme Managers, Assistant Regional Programme Managers, and coordinators for Human Resources (HR), finance and logistics. These staff were tasked with facilitating and monitoring the quality of the humanitarian service delivery at woreda level. At country-office level, operations and systems departments also added new staff, including Programme support officer, Partner support officer and Roving nutrition programme manager, while HR, finance and logistics also

increased their roving teams to support the scale-up operation. With this, GOAL Ethiopia increased its total staff by 218% from November 2015 until October 2016.

GOAL's Headquarters Technical Team scheduled three nutrition support visits by HQ Nutrition Advisors during the scale-up in November 2015, May 2016 and August 2016 to independently review the quality of services provided and give operational guidance. Other support visits were conducted by GOAL's Regional Director (twice), the HQ Programme Quality Advisor and the Global Humanitarian Advisor.

Challenges

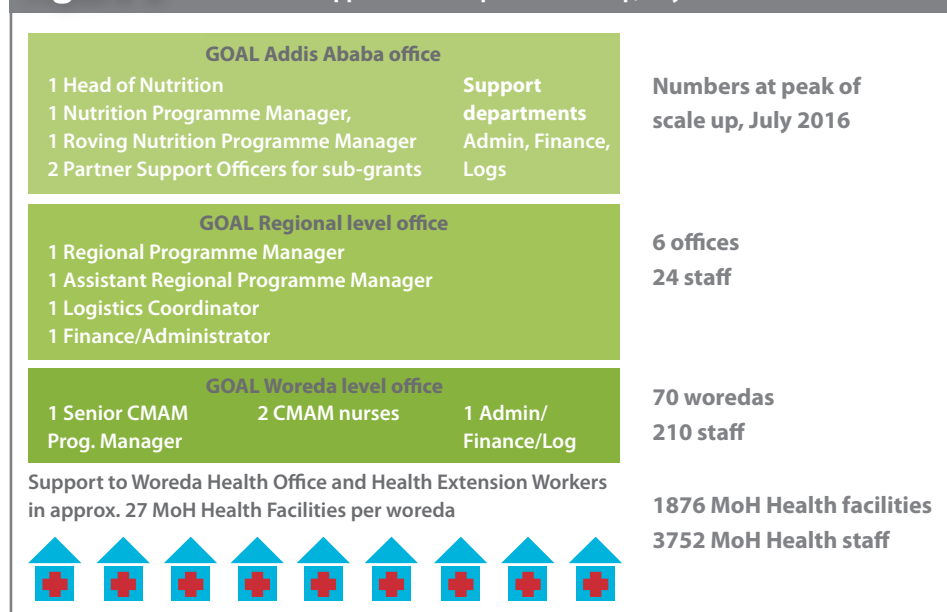
In eight months from November 2015 to July 2016, GOAL Ethiopia tripled the number of CMAM-supported woredas. MoH SAM admissions peaked at 4,097 in June 2016, compared with 2,768 SAM admissions for the same month the previous year. Despite detailed implementation plans being designed, this scale-up brought to light several challenges and lessons learnt for the GOAL nutrition team.

Operational challenges

Human Resources Tripling the number of woredas supported also means tripling the number of GOAL staff to cover new operational areas. GOAL's existing CMAM support operation in 22 woredas allowed it to relocate experienced CMAM staff to new woredas quickly. Gaps were filled through the CMAM Trainee Nurse programme (described above). As this rapidly proved successful, the model was adopted by other NGOs, including GOAL Ethiopia's five sub-grantees, improving the human resources pool for the emergency response.

Logistics A significant challenge encountered by the logistics team during the rapid scale-up was ensuring the right products and services were available in the right place at the right time. Procurement of basic materials to ensure all health facilities were adequately stocked in new woredas increased massively, requiring modifications to be made to 'normal' procurement procedures to enable more responsive and speedy actions to be taken. This included the use of waivers⁵ when deemed acceptable and pre-positioning of CMAM start-up kits in strategic locations, thus eliminating previous procurement lead times of two months plus. With the government restrictions on purchase of new vehicles in Ethiopia, GOAL used rental cars for all newly covered woredas. A shortage of both rental cars and rental companies willing to rent out cars to remote regions of the country made it difficult to cover all transport needs of the scale-up operation. To overcome this problem,

Figure 3 GOAL CMAM support model at peak of scale-up, July 2016



⁴ The hotspot classification is reassessed every three to four months. Any newly identified woredas that are not supported by partners are presented in ENCU coordination meetings; partners are invited to cover these if they have the necessary funding.

⁵ To waive a certain procurement or sign-off procedure in order to make the process quicker for emergency situations (e.g. a procurement of a certain amount requiring sign-off by a higher level staff can now be signed off by a lower one).

Table 2 Quality Assurance checklist and scoring for health facility and woreda, OTP

Parameter	Score* from 1 – 5
1) Technical ability (know-how) 1	
Weight is measured correctly	
MUAC is measured correctly	
Oedema is checked correctly	
Medical check-up is done correctly	
Weight gain for each patient is analysed on each follow-up day and action is taken if the patient is stagnating in weight gain or loses body weight	
Patient's card is filled in correctly	
2) Technical ability (know-how) 2	
SAM children are admitted according to the criteria	
Treatments are given according to the protocol	
Children are discharged according to the criteria	
Complicated SAM cases are identified correctly	
Complicated SAM cases are referred timely	
3) Social mobilisation using volunteers	
Volunteers are involved during OTP day	
Health education is given to the community (check health education programme, talk to community)	
Volunteers visit households (for screening, etc)	
Volunteers conduct follow-up for absentee tracing, etc. (Check their plan)	
HEWs/nurses do regular meetings with community volunteers on mobilisation (check any minutes or registration book)	
3) Staff attendance	
The necessary number of MoH staff available in the health post /health centre	
HEWs do not wait for GOAL staff to start CMAM service	
All the required staff** participate in the management of SAM children	
HEWs/nurses stay the whole day in the HF during the OTP day	
Health Extension supervisors visit the site every two weeks/ monthly	
4) Stock control recorded correctly (include NFIs, drugs and RUTF)	
RUTF stock card / control format is available	
Drug stock card / control format are available	
Soap Stock card / control format is available	
Stock cards are filled in timely manner	
The physical count of the Drug/RUTF/soap is similar to that of the stock card	
Buffer stock of one carton of Plumpy Nut is in place	
5) Overall MoH management of site	
The necessary materials are available and in good working condition (MUAC tape, Salter scale, beneficiary cards, etc)	
Sufficient therapeutic products and drugs are available in the health facility for a month at least	
Specific OTP day allocated for follow-up	
Stock cards are filled in timely manner	
Health education session schedule is available	
6) Completion of weekly and monthly tally sheets without errors and supply to woreda health office	
Weekly report accurate and complete	
Monthly report accurate and complete	
Monthly report submitted last month to woreda health office on time	
Reports are filled properly (weekly, monthly)	
Documents are kept properly in folders and are available at OTP follow-up day (registration books, patients cards, etc)	
Overall scoring of site or woreda **	

* Scoring is done for each parameter on a scale from 1 to 5 (1=poor, 2=fair, 3=good, 4=very good, 5=excellent) for each health facility. Woreda scoring summarises all the health facility scores in one woreda, thus poorly performing health facilities and woredas could be identified for increased on-the-job training and mentoring going forward.

** Overall scoring is done by summing individual scores and divide them by 36.

*** Specifically two HEWs (two HEWs always runs a health post/centre)

GOAL Ethiopia reassigned its own vehicles to areas where rental companies did not want to go.

Pipeline As pipeline ruptures are frequent and to a certain degree predictable during the initial phase of an emergency, GOAL decided to purchase and pre-position various MAM and SAM treatment commodities at woreda level in strategic sites. Consequently, GOAL was able to help the MoH avert serious problems when trying to manage the influx of acutely malnourished cases by ensuring that essential drugs were available, basic material provisions could be accessed, and adequate hygiene-sanitation could be ensured. If this had not been the case, morbidity and mortality rates would undoubtedly have risen.

Coordination During the course of 2016, the ENCU was faced with a critical gap in the absence of an in-country 'cluster coordinator' overseeing the response. Consequently, GOAL filled this position temporarily within the ENCU for November 2015 until a permanent replacement was identified. This demonstrates the versatility and utility that NGOs can provide, especially during times of stress. In spite of GOAL's efforts, additional coordination staff were and are still needed at national level to help direct coordinated and effective emergency responses. At a decentralised level, however, particular regions, including Amhara and Oromia, demonstrated very strong coordination across the regions and between zones. GOAL also found that actively participating in technical working groups proved extremely useful in terms of contributing to positive developments in guideline approaches, such as reducing screening timeframes for activities carried out by HEWs from monthly to weekly.

Funding Donors proved agile and were able to respond in a timely fashion, largely due to the significant efforts employed by the Government of Ethiopia to collect, collate and analyse early warning information, resulting in an accurate, anticipated prediction of the size and scale of the emergency. Due to long-standing relationships GOAL has with many donors in Ethiopia, we were able to readily access funding to deliver a rapid CMAM scale-up in line with plans. Donors recognised GOAL's capacity for rapid response and, in addition to increased CMAM support, were also able to provide funds for some supportive nutrition-sensitive activities, including WASH (water, sanitation and hygiene) for CMAM and emergency seeds for CMAM beneficiaries. Unfortunately, despite attempts, GOAL was unable to find funding for other nutrition-sensitive activities that would have significantly improved morbidity outcomes, such as the management of epidemics, including scabies and diarrhoeal outbreaks.

Challenges with service quality

Over the last ten years, GOAL has refined a minimalist support approach appropriate for Ethiopia, delivered through two to three core technical individuals in each woreda. Therefore, GOAL fully realised that reducing the number of experienced staff per woreda, in conjunction with the hugely elevated caseloads, would inevitably result in challenges to ensure that service quality was maintained. Box 1 below highlights some of the challenges the teams faced during the first couple of months of support.

Quality Assurance Framework

In light of the issues identified during the initial phase of the scale-up, GOAL Ethiopia put a more stringent and de-

Box 1 Service quality issues identified by GOAL

- The time required to address administrative issues by Senior CMAM Programme Managers at the outset of the support period within a new woreda was significant, meaning time available to provide technical guidance for newly recruited and trained nurses had to be compressed.
- On initial review, infrastructure services in new support woredas were often deemed sub-standard, thus time had to be allocated to improve these (for example, the hygiene and sanitation of kitchen areas of in-patient sites).
- At the outset of the support period, GOAL was often challenged by woredas not having the requisite materials and supplies to deliver adequate care, such as measuring jugs, powder scoops for milk feeds, poor quality/lack of MUAC tapes and inadequate buffer stocks of therapeutic milks and RUTF at health-facility level.
- Incorrect anthropometric measurements being taken/recorded.
- Inappropriate resource allocations within woredas, i.e. sites with low inpatient caseloads sometimes had numerous feeding kits.
- Despite Ethiopia including nutrition in clinical and nursing pre-service training packages, some MoH medical staff were identified as still not having received training on inpatient care.

tailed Quality Assurance Framework (QAF) in place to govern the quality of the emergency nutrition response and ensure quality was not compromised by scale. The framework consisted of an updated quality assurance checklist and a dashboard summarising quality scores for each health facility and woreda. The checklist (observational data) is used by the CMAM nurses and the Senior CMAM Programme Manager (woreda-based staff) for monitoring health facilities running therapeutic services. Bi-monthly meetings at national level were conducted to discuss dashboard results and schedule support visits for woredas that scored low in quality (any score below 2.0 was considered low, see Table 2 outlining the checklist for OTPs). Scale-up to new woredas was temporarily suspended for a three-week period in April/May 2016 to provide adequate time for senior technical staff to undertake warranted support visits and embed this process. In light of GOAL flagging specific issues, in conjunction with high-level GOAL technical support, regional and woreda technical staff also increased targeted supervision, having the combined and desired effect of perceptibly increasing service quality.

Conclusions

To enable GOAL to more than triple the level of support in a matter of months, adequate forewarning of the impending situation was critical. Rigorous data collection and analysis by the Government ensured that donors and support partners alike were well aware of the deteriorating situation and the impending crisis that unfurled during 2016, months in advance.

Consequently, adequate funds could be mobilised by key donors and NGOs, including GOAL and its partners, who were therefore able to respond to many of the hotspot classification

1 woredas in a timely manner, ensuring that the substantial increase in caseload did not significantly lead to a decline in service provision. Thus GOAL has demonstrated that a rapid scale-up of NGO support to the MoH to provide quality CMAM care in a short timeframe, in acute emergency contexts, is feasible.

Although logistical, pipeline, coordination and funding challenges were encountered, working solutions were identified to overcome most issues effectively. Two issues warrant flagging. First, there is a human resources issue that should be addressed differently in prospective emergency-support programming by adding an additional, non-technical GOAL support person per woreda team, tasked with overseeing the raft of administrative issues that need addressing during the initial months of support. This would free up GOAL technical staff to focus exclusively on strategic support to both field and clinical/facility-based MoH staff. Second, GOAL should continue to request that donors seriously consider funding parallel nutrition-sensitive activities during this type of emergency, such as managing concurrent disease outbreaks, that are intrinsically linked to nutrition outcomes.

GOAL recognises that an INGO-led response, albeit using a skeleton staff structure so as not to undermine existing operations, is not a sustainable model, given the cyclical and thus largely predictable nature of emergencies in Ethiopia.

The CMAM support provided by GOAL and direct partners (sub-grantees) in both emergency and non-emergency periods is focused around capacity-building, in-service training and working to improve data management, supply chains etc. These are all targeted at improving the

quality of MoH service provision, both at facility and community level. This is a reasonably sustainable model, although it is dependent to some degree on staff turnover, but it does not build any long-lasting government capacity to respond to emergencies. GOAL has therefore been in discussion with the Government of Ethiopia and donors over the past two years concerning the potential for collaboration with the MoH to build a rapid-response capacity which would transition away from an INGO-led response. Two CMAM-focused concepts have been proposed by GOAL.

The first focuses on a systems-strengthening approach to emergency nutrition response. The second focuses more on building capacity of the MoH to address coverage issues for treatment of acute malnutrition. This would appear to be the next logical and progressive step for the MoH to take greater responsibility for CMAM in predictable, chronic emergencies.

In this respect, it should be noted that 'rapid response' in general is already listed in the Health Sector Transformation Plan under Strategic Initiatives: "...developing a national health emergency workforce with the right skill mix to enhance standing and surge capacity of the country to respond to emergencies..." (MoH, 2015) and is thus a key aim for the Ministry until 2020.

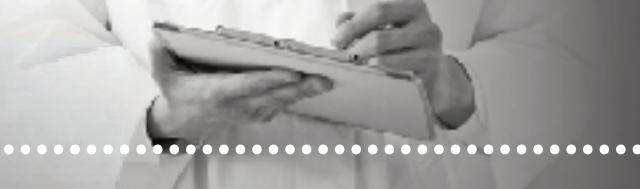
For more information, contact: Hatty Barthrop, email: hbarthrop@goal.ie

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www.globalfinancingfacility.org/sites/gff_new/files/documents/HSTP%20Ethiopia.pdf



MUAC measurement taken by Health Extension Worker, Tigray region



The following provides a short summary of each of these important research studies. A fuller summary of each can be found online at www.ennonline.net/fex

Feeding behaviours during home-based MAM treatment using corn-soy blends or lipid-based nutrient supplements

Community-based care using lipid-based supplements (LNS) or enhanced versions of corn-soy blends (CSB) has been recommended since 2007 for the management of acute malnutrition. LNS and CSB differ in nutritional composition and in texture, usage, preparation and ingestion. Such factors may affect feeding behaviours and are important, given the crucial role of the caretaker and home environment in the community-based care approach. This randomised controlled trial used a qualitative, mixed-methods approach to compare feeding behaviours related to supplementary feeding with a CSB product and LNS in moderately malnourished children. Product-specific feeding advice was provided. Observed frequency of feeding was 1.6 times/day for CSB and 1.5 times/day for LNS; both were mainly eaten as single items, although LNS were mostly likely to be mixed with other foods.

Results show that the main differences in feeding behaviours between the two diet groups were linked to how and when supplements were served. LNS were more likely to be mixed into other foods and fed using an encouraging feeding style with more tactile feeding behaviours. CSB were more likely to be served as a meal and fed using a forced-feeding style. The authors suggest that the difference in feeding styles could be that CSB porridge looks more like a traditional food that caretakers may be used to force-feeding. In contrast, with LNS, caretakers were more aware that they were feeding something different with special instructions to avoid force, emphasised by the fact that LNS were often referred to by caretakers as “medicine”. One surprising finding was the consumption of unprepared CSB flour as a snack. The recommended five-to-ten-minute cooking time for CSB is essential in ensuring digestibility and nutrient

availability, which may be affected if consumed without preparation.

The authors summarise that feeding behaviours in relation to supplementary feeding are an important consideration in ensuring successful outcomes of nutritional interventions. Educational instructions should be adapted according to the supplement provided. In particular, efforts should be made to promote an encouraging feeding style with CSB and to ensure preparations are made according to recommendations.

Iuel-Brockdorf A-S, Ouedraogo A, Ritz C, Draebel TA, Ashorn P, Filteau S and Michaelsen KF. (2016) *Feeding behaviors during home-based treatment of moderate acute malnutrition using corn-soy blends or lipid-based nutrient supplements*. *Matern Child Nutr*, doi: 10.1111/mcn.12399.

Environmental enteric dysfunction and growth failure/stunting in global child health

Approximately 25% of the world's children aged under five years have stunted growth, which is associated with increased mortality, cognitive dysfunction and loss of productivity. Environmental enteric dysfunction (EED) may play a central role in the pathogenesis of stunting. This article summarises a three-day meeting organised by the International Atomic Energy Agency (IAEA), which focused on EED and the prospects for its reduction or amelioration in children living in the developing world. The result is a ‘state-of-the-art consensus statement’ on the link between

EED and stunting in global child health, which includes the following points.

EED may operate differently in different children; there may be considerable individual variation in gut “leakiness”, bacterial translocation, malabsorption and nutrient requirements. Current understanding of EED is severely limited by its complex spectrum and by the absence of robust biomarkers and non-invasive, simple point-of-care diagnostic tools. Much has been learned about the biology of health and disease states through application of ‘-omics’ technologies¹: genomics, epigenomics, transcriptomics, proteomics

and metabolomics. As a pathologic condition, EED is an excellent candidate for -omics surveys because so little is known about the mechanisms through which it exerts its deleterious effects.

In the context of poor socioeconomic conditions, potential interventions to tackle EED include increased access to clean water and improved sanitation and hygiene; promotion of dietary diversity and breastfeeding; adequate supplementation with micro and macronutrients; use of anti-inflammatory agents; and antibiotics for children with severe acute malnutrition and infection. Some research is underway, however, the development of simple point-of-care diagnostic tools and longitudinal studies on EED treatment remain key gaps. Application of innovative technologies and techniques, such as -omics technologies, are needed to better understand, prevent and treat EED.

Owino V, Ahmed T, Freemark M, et al. *Environmental Enteric Dysfunction and Growth Failure/Stunting in Global Child Health*. *Pediatrics*. 2016;138(6):e20160641

¹ Collective technologies used to explore the roles, relationships and actions of the various types of molecules that make up the cells of an organism.



A child hospitalised with severe acute malnutrition in Wajir, Kenya

Inpatient management of children with severe acute malnutrition: a review of WHO guidelines

WHO guidelines for the management of complicated severe acute malnutrition (SAM) advise that SAM case fatality should be less than 10%; in reality, observed mortality rates may be higher, even in well-resourced settings. The purpose of this review was to trace the lineage of each existing recommendation and its supporting citations to identify evidence gaps in the WHO SAM inpatient guidelines that, if filled, may help to further reduce case fatality rates.

Results of the study show that gaps persist and extend across the entire spectrum of treatment of complicated SAM. The evidence base is heavily

reliant on expert opinion in the absence of published data, varying by clinical area, and is generally of “very low quality”. Relevant recommendations have undergone very limited substantive revision over the past two or more decades; historical evidence may not be generalisable to contemporary children with complicated SAM. The paucity of relevant research may arise from a misconception that further work is unnecessary because adequate guidelines exist. However, the underlying evidence for most management areas is weak.

The current global undernutrition research agenda is largely focused on reducing the burden

of stunting and moderate acute malnutrition, which are important and justifiable areas of concern, but the half a million children who die from SAM annually should not be neglected. Only a few ongoing clinical trials are being conducted in high-priority areas such as antimicrobials use, treatment of HIV-infected children and treatment of infants under six months. Although enhanced implementation of current guidelines would improve outcomes, a renewed and even modest investment in relevant epidemiological and clinical research is likely to lead to more effective recommendations and lower mortality.

Tickell KD and Denno DM, 2016. *Inpatient management of children with severe acute malnutrition: a review of WHO guidelines*. Bull World Health Organ 2016;94:642–651. doi: dx.doi.org/10.2471/BLT.15.162867

Weight gain and height growth during infancy, childhood and adolescence as predictors of adult cardiovascular risk

Cardiovascular disease (CVD) is the leading cause of death globally and the population incidence of CVD and related metabolic disorders is higher in low and middle-income countries (LMICs) than in the rest of the world. Mortality because of premature CVD is increasing in South Asian countries such as India. Growth patterns in early life are important predictors of adult CVD risk factors. The purpose of this study was to investigate independent relationships of childhood linear growth (height gain) and relative weight gain to adult CVD risk traits in Asian Indians with the purpose of better understanding this area.

Data was analysed from 2,218 members of the Vellore Birth Cohort at a median 28.1 years of age in Tamil Nadu, India. Cross-sectional height, body

mass index (BMI) and longitudinal growth from birth through to adulthood were examined for associations with adult waist circumference, blood pressure, insulin resistance and cholesterol concentrations. Results of the study show that greater height and BMI after birth and through to adolescence are associated with higher CVD risk factors in adulthood and these associations are largely attributable to adult height and BMI.

Monitoring childhood weight and height and active intervention to prevent or reverse upward crossing of BMI percentiles may reduce later CVD risk. In this study, individuals who had greater linear growth during childhood and/or became taller as adults had higher adult waist circumference (WC), blood pressure (BP), insulin resistance and

cholesterol concentrations. It is not clear whether these associations reflect an increased risk of future CVD; associations between linear growth and adult CVD risk need further investigation. Infant weight gain was positively related to adult WC, but unrelated to BP or the biochemical CVD risk markers, suggesting that the common clinical practice in LMICs of promoting infant weight gain to enhance survival and neurodevelopment is unlikely to have either adverse or beneficial implications for future CVD risk.

Antonisamy B, Vasanth SK, Geethaniali FS, Gowri M, Hepsy YS et al. (2017) *Weight gain and height growth during infancy, childhood, and adolescence as predictors of adult cardiovascular risk*. Journal of Paediatrics. Vol. 180, p.53-61.e.3.

Trial of fish-shaped iron ingot to treat iron deficiency anaemia in Cambodia



Women preparing food in Cambodia

WFP/David Longstreath, Cambodia, 2012

Iron deficiency anaemia (IDA) is a public health problem affecting two billion people (mainly women, children and infants) worldwide, with serious consequences for human health and socio-economic development. Mild to moderate anaemia reduces immunity, work capacity and cognitive ability; severe anaemia is a major cause of maternal morbidity. In Cambodia, the condition affects 55% of children, 50% of pregnant women, and 43% of women of reproductive age. This recent randomized controlled trial (RCT) in rural Cambodia investigated whether cooking with an iron ingot increases haemoglobin and serum ferritin in women, and whether women would use the fish-shaped ingot (resembling a fish considered lucky in Cambodia).

The one year trial found a 46% reduction in the prevalence of anaemia within the intervention group with or without education sessions; women in the control group were more than 2.8 times more likely to be iron deficient and more than 4.6 times more likely to have IDA. The authors noted some initial reluctance to use the ingot, but this was overcome by habitual use in daily cooking routines. Over 90% of women in both intervention groups used the ingot at least three times per week throughout the study. The results imply that regular use of a fish-shaped ingot supplies bioavailable iron that is effective in reducing the prevalence of iron deficiency. Women using the ingot showed improved iron status with or without education sessions, an unexpected outcome for researchers who anticipated that education would make a difference to the impact.

Charles CV, Dewey CE, Hall A, Hak C, Channary S, et al. (2015). *A Randomized Control Trial Using a Fish-Shaped Iron Ingot for the Amelioration of Iron Deficiency Anemia in Rural Cambodian Women*. Trop Med Surg 3: 195. doi:10.4172/2329-9088.1000195

Maternal Malaria and Malnutrition (M3) initiative

It is estimated that each year over 125 million pregnant women in low and middle-income countries (LMICs) are at risk of infection with malaria. Malaria contributes to the high burden of maternal morbidity and mortality in these settings and may affect placental development and foetal growth. Sequestration of *P. falciparum* parasites in the placenta has been associated with foetal growth restriction (FGR) and low birth weight (LBW < 2500g), thus contributing to infant mortality and possibly long-term health problems. Malaria during pregnancy may also cause maternal

anaemia, which itself can have deleterious effects on foetal development. It is currently unclear whether the susceptibility to and the impact of malarial infection are affected by maternal nutritional status.

A number of studies on malaria in pregnancy have collected maternal anthropometrics and data on anaemia. Similarly, some recent trials of nutritional supplementation during pregnancy collected malariometric indices. The Maternal Malaria and Malnutrition (M3) initiative has pooled data from 13 such studies in Africa and

the Western Pacific (14,635 live pregnancies) with the hope of improving the understanding of malaria-nutrition interactions and to foster collaboration between nutritionists and malariologists. Topics of interest for M3 include an evaluation of whether macronutrient undernutrition modifies the impact of malaria infection during pregnancy; the investigation of potential interventions that address both malaria risk and nutritional status during pregnancy; and the study of the role of anaemia in relation to adverse pregnancy outcomes.

Preliminary data from the Democratic Republic of the Congo identified the risk of foetal growth retardation (FGR) was two to eight times higher among women with evidence of malnutrition. Two participating studies provided evidence regarding nutritional interventions during pregnancy (involving fortified food supplementation and lipid-based nutrient supplements). Considerable further analyses are planned. As the largest pregnancy dataset to date, M3 hopes to help identify pregnant women at high risk of adverse outcomes who may benefit from tailored, intensive, antenatal care.

Unger HW, Cates JE, Gutman J, et al. (2016). *Maternal Malaria and Malnutrition (M3) initiative, a pooled birth cohort of 13 pregnancy studies in Africa and the Western Pacific*. *BMJ Open* 2016;6:e012697. doi:10.1136/bmjopen-2016-012697

WFP/Nyami Quarayns, Gambia, 2014



A mother receiving pre-natal care in the Gambia

What's in a name? A call to reframe non-communicable diseases

In this latest issue of the *Lancet*, Allen and Feigl comment on the need to reclassify non-communicable diseases (NCDs) in the global health community. The authors state that the historic classification of NCDs provides a name that is defined by what this group of diseases is not, when in fact they now constitute the world's largest killer (WHO, 2011). NCDs – which include cancer, diabetes, chronic obstructive pulmonary disease, cardiovascular disease and mental health conditions – are the leading cause of death worldwide and disproportionately afflict developing countries. They will cost the global economy US\$47 trillion over the next two decades and they continue to push millions of people into poverty (Bloom et al, 2011). Nevertheless, NCDs receive the lowest overseas development assistance per disability-adjusted life-year and

even the most cost-effective NCD interventions are severely underfunded compared with their infectious disease counterparts. NCDs are also under-represented in developing countries' national health plans, undermining progress towards reaching universal health coverage and improvement of human capital.

The authors argue that the current situation might be partly attributable to the framing of these conditions. After all, “anything that begins with ‘non’ may be considered a ‘non-issue’ or a ‘non-starter’” (Sridhar, Morrison and Piot, 2011). Emphasis on individual healthy choices does not account for the growing evidence that some NCDs are partly or wholly communicable and have societal causes, too. The term “non-communicable” does not spur a sense of urgency

and deflects attention from effective, system-wide interventions.

The Sustainable Development Goals (SDGs) have cemented the importance of NCDs on the international agenda and appropriate indicators for Goal 3 are being determined. Reframing the issue may help refocus the global response. Although there is no perfect alternative, the authors favour the terms “societal” and “ecological” (i.e. the relation of living organisms to one another and to their physical surroundings), but invite debate on the topic under the auspices of *The Lancet Global Health*.

Allen LN and Feigl AB. (2017). *What's in a name? A call to reframe non-communicable diseases*. *The Lancet*. Volume 5, No. 2. e129-e130, February 2017.

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Accessing quality research to enable evidence-informed national policy: experiences from Zimbabwe



By Willie Ganda

Willie Ganda is Director for Research Development and Innovation, Ministry of Higher and Tertiary Education, Science & Technology Development, Zimbabwe.

Location: *Zimbabwe*

What we know: Evidence-informed national policies and implementation plans are necessary to achieve global targets such as the Sustainable Development Goals.

What this article adds: Research output in Africa lags well behind Europe. Challenges to cutting-edge research in the continent include: lack of funding (it is not a priority for budget decision-makers); poor investment in education to PhD level (basic education is prioritised); skills migration to overseas institutions; and limited international collaboration, especially in research innovation and design. These factors are compounded by expensive and limited internet connectivity; reliance on external donors for research infrastructure, which undermines national 'buy-in' to research; and little demand from policy-makers on research needs. Low capacity of researchers to communicate findings simply and of policy-makers to interpret research hamper evidenced policy development; collaboration between these communities is largely poor. Actions needed include development of a tier of PhD researchers; harnessing and attracting researcher diaspora; innovating through information and communication technologies to harness global skills; and establishment of local repositories for refined research outputs and policy briefs to help bridge the research/policy divide.

Introduction

The lack of cutting-edge research, as well as a lack of evidence-informed policy-making, are major hindrances to development in Africa. If Africa is to deliver its obligations under the Sustainable Development Goals (SDGs), it will need to develop and utilise cutting-edge research as an enabler. This article explores the experiences of and challenges to high-calibre national research and the challenges of evidence-informed policy development in Zimbabwe.

Status of research in Africa

The status of research in Africa is far from satisfactory. From 2005 to 2010, the average research output per capita per million people for the surveyed countries was 33.65 papers. Excluding South Africa, the output falls to 25.68 papers per capita per million people. The research situation across Africa is mirrored in Zimbabwe. The per capita research and development (R&D) output per million residents for Zimbabwe from 2005 to 2010 was 25.0 (NEPAD, 2014). This output represents a decline of 2% attributable to the economic challenges that the country

has continued to face and subsequent skills migration in many areas. This contrasts starkly with an output of over a thousand papers per million residents for many countries in Europe.

The total research output from Africa reflects the unhealthy state of research on the continent. Africa's total research output (NEPAD, 2014) of publications between 2008 and 2010 was 106,825, a mere 1.96% of a total world output of 5,436,451. Putting this in a global perspective, Africa has a population of 1.2 billion people, about 16% of total world population. Even more worrying is the quality of research output. According to the same report, the impact of research output by African countries, measured by journal of publication impact factors, is below world average in most fields, except for historical studies (above world average), and engineering and public health and health services (world average).

Challenges to cutting-edge research in Zimbabwe

Like most African countries, Zimbabwe faces diverse but interrelated challenges in the area of research; below are some of the most pertinent.

Lack of funding

The major primary cause of low research output in Zimbabwe (and Africa generally) is funding. During the post-independence period, most African countries invested heavily in basic education. Despite a commitment by African governments to allocate at least 1% of gross domestic product (GDP) to research, no country has reached that minimum threshold. Zimbabwe's expenditure on R&D in 2010 was only US\$24 million – about 0.254% of GDP (NEPAD, 2014). Closer scrutiny of this expenditure shows that the bulk is accounted for by salaries of fulltime equivalent staff in universities and research institutions for research-related activities.

Through the provision of free basic education, most African countries were able to build a critical mass of relatively well-educated populations in terms of basic literacy. Typically, education (basic) and health sectors get the largest share of national budgets; those allocating resources often question specific allocation on research. As long as research remains a low priority for African governments, it is impossible to expect meaningful R&D output that would make a difference locally, regionally and globally.

Skills capacity of researchers

In order to carry out cutting-edge research, researchers need to have the appropriate skills at the highest possible level. At the basic level, a country needs a good stock of researchers with PhD-level education. While Zimbabwe has a relatively good stock of these, the last 15 years have witnessed significant skills migration as the most skilled researchers moved to other countries in search of better opportunities. The 2013 survey ((NEPAD, 2014)) indicated that only one of the top 500 researchers in Africa was from Zimbabwe; though contested by Zimbabwean researchers, the skills drain across many key sectors is indisputable. The Zimbabwe country survey confirmed that only 13.23% of staff working in R&D had PhDs: 68.2% had first-stage theoretical and practical tertiary education (degree); the remainder had other, non-tertiary qualifications. This situation is clearly undesirable from a skills perspective; ideally the majority should have PhDs.

Rapid changes in technology have compounded the problem by rendering certain skills obsolete. Research equipment, for example, has become more sophisticated and has been digitally transformed, with less human manipulation required in scientific processing and presentation of results. The arrival of supercomputers has vastly changed the research domain, giving new capabilities unimaginable a couple of years ago. The inability of researchers to upgrade their skills and keep up with the times has also rendered some supposedly skilled people irrelevant in the current environment.

Limited international collaboration

One of the key features of today's globalised research enterprise is international collaboration. Globalisation of research enables researchers to be part of international research networks that can access resources that are highly competitive as funders increasingly demand credible return on investment. The inability to provide the skills and necessary infrastructure has limited the extent to which Zimbabwean researchers can collaborate internationally. Compounded by perceived high-country risk, Zimbabwe has, over the years, suffered a sharp decline in international research collaborations. Current work has been limited to tail-end collaborations in clinical research trials, mainly in the area of health and some in agriculture. This situation has created a serious skills gap in most segments of the research value chain and has not aided in giving the country the requisite skills to participate in the value chain of own vaccines or drugs discovery, for example.

Poor infrastructure

In order to carry out meaningful research, researchers need the appropriate infrastructure. Like most African countries, since independence Zimbabwe has faced the persistent problem of poor or obsolete research infrastructure. This is largely a product of perennial underfunding of research, compounded by donor-dependence syndrome. It is likely that much infrastructure in research institutions in Zimbabwe came through donations and there is a long-entrenched culture that academic institutions approach donors for good research infrastructure. The role of donations in building research infrastructure is of course welcome, but without equal if not greater commitment to building infrastructure through a country's own internal resources, there will be no ownership of the overall national research agenda. Without ownership, it has been often the case that the donated equipment ends up being underutilised.

Ageing researchers

A key feature of the African research profile is its distinctly ageing population. This is more pronounced in the scientific community. The low output of PhDs by institutions is a contributing factor, but even for the few that do get opportunities to study for PhDs overseas, returning home has been a major problem. Research skills mobility is a global phenomenon and young researchers increasingly want to be in those countries that give them the best opportunities. Given the generally unfavourable prevailing local conditions, emigration of young researchers has meant institutions have no option but to tenure large numbers of ageing researchers who are past retirement age. The general absence or shortage of young researchers who can be mentored by senior researchers is a time bomb, given the broad base of the population pyramid in most African countries. Unless measures are put in place specifically to increase the output of young PhD researchers and retain them, complemented by incentives to attract the African research diaspora, a critical research skills crisis looms in the continent.

High cost of connectivity

Reliable internet connectivity is one of the most important tools a researcher needs. Big data is now the defining phenomenon of our time and any cutting-edge researcher must have a fast and reliable internet connectivity as a basic tool to access global data sources and communicate with peers in research networks. While progress has been made in internet access, costs remain high. The cost of accessing basic, unlimited broadband internet in Zimbabwe is between US\$60 and US\$120 per month. While in absolute terms this is comparable to countries such as Australia, it is very costly given Zimbabwe's average monthly income of US\$253 compared to US\$6,500 in Australia. Due to cost, bandwidth is a key limiting factor at institutions, which constrains information access and limits communication to basic email. This is compounded by the fact that telecomms companies continue to bill academic institutions at very high commercial rates, rather than cheaper educational rates.

Little demand for research from industry and public sector

For research to thrive, it requires a ready market for its outputs. Traditionally, academics conducted research to publish papers and get promotion within their institutions, but the primary purpose of research should be to produce useful new knowledge for industry and the public sector to produce better products and services. Ideally, the research agenda should be largely driven and funded by those who consume its outputs. The local context, however, lacks this 'pull' factor in the R&D value chain, as evidenced by weak demand for research from industry and the public sector. Many reasons are attributed to this phenomenon. Some of them are structural, especially where industry is concerned. The domination of the industrial sector in developing countries by multinationals is one major contributing factor to low investment in R&D. Most multinationals tend to site their research centres in their country of origin for strategic purposes. However, the absence of demand for research outputs by the public sector is most worrying. The absence of commissioned research is evident in poorly crafted policies that are not informed by research results. If governments themselves are not consuming research results, they have no incentive to commit already-limited resources to the research agenda.

Challenges to evidence-based policy in Zimbabwe

Good policy and its means of implementation must be an outcome of well-considered positions informed by research evidence. The lack of demand for research results reflects the lack of capacity in both researchers and consumers of research (policy-makers). The researcher must be able to research and package his/her research results in a manner that the policy-maker can understand. Those using research findings need basic competencies to interpret the results and confidence in the research; the latter is particularly important where evidence is contrary to that expected. The general belief that foreign research

is superior to local research has compounded low confidence in and take-up of the latter. More often than not, researchers and policy-makers have found themselves at cross-purposes, rather than working closely together.

The absence of readily accessible local repositories of published research or research-informed policy briefs presents a challenge to using research results to generate evidence-informed policy. The most useful data on most countries is owned and stored outside those countries.

In the case of Zimbabwe, one of the major success stories in evidenced-informed policy has come from the health and education sectors. Through commissioned research and the work of dedicated institutions like the Biomedical Research Institute, Zimbabwe has implemented evidence-informed policies that have seen a massive reduction of HIV and AIDS prevalence from a peak of 27.7% in 1997 to the current average of 15%, but this example remains the exception rather than the norm.

Looking ahead

Going forward, it is imperative that developing countries, Zimbabwe included, put in place robust mechanisms and nurture a new culture of drawing on research results to inform policy. To do this there is an urgent need to invest in the research skills development value chain and accelerate training of researchers at PhD level. The public sector must be one of the prime consumers of research outputs through commissioning research and setting up think tanks that will utilise research results to inform public policy. If the public sector becomes an active consumer of research outputs, it is much easier to tackle the perennial problem of underfunding; those that allocate resources can see a direct correlation between research and public-sector service delivery.

Developing countries that have suffered skills flight should adopt innovative ways of harnessing their diaspora. Advances in information and communications technologies offer great windows of opportunity to tap into the skills of researchers worldwide. If properly structured and correctly implemented, programmes harnessing the diaspora could be a new source of growth for developing countries. In aiming to assist them, it is imperative that development agencies craft programmes that help harness the diaspora's potential. The need to establish local repositories for refined research outputs and policy briefs is urgent. These repositories will be an active medium helping to bridge the gap between research and policy.

For more information, contact: Willie Ganda, email: wgdanda@zchpc.ac.zw; gandawd@yahoo.com; <https://www.linkedin.com/in/gandawillie>

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Beyond the drinking glass: expanding our understanding of water-nutrition linkages

By Dawit Mekonnen, International Food Policy Research Institute

Dawit Mekonnen is a Research Fellow at the International Food Policy Research Institute (IFPRI) in the Environment and Production Technology Division. His current research in sub-Saharan Africa focuses on understanding the impact of

irrigation on agricultural productivity, nutrition, health and women's empowerment under the Feed the Future Innovation Lab for Small-Scale Irrigation, a bilateral activity under the CGIAR Research Programme on Water, Land and Ecosystems.



WFP/Rein Skallerud, Liberia, 2015

Water access and management play central roles in determining nutritional outcomes. Water-for-nutrition is most often approached from a WASH (water, sanitation and hygiene) perspective, where the aim is to improve water quality and practices for domestic water supply, thus reducing the burden of water-related diseases in a population. A WASH focus for improving nutritional outcomes is especially pertinent, given recent evidence highlighting the role of diarrhoeal disease and environmental enteropathy in determining child stunting. However, there are a number of water-nutrition pathways in addition to WASH that would benefit from greater attention in research and discussion. A session aimed at expanding our understanding of water-nutrition linkages was organised during the 2016 Stockholm World Water Week (26 August to 5 September, 2016). The session was organised by the International Food Policy Research Institute (IFPRI) in collaboration with the Center for Development Research (ZEF) at the University of Bonn, USAID, and Texas A&M University.

Outline of the session

The session was organised to strengthen insights on the interaction between sectors not often linked: nutrition, gender, irrigation, WASH and agriculture. It started off with an interactive activity where participants wrote down components of the water-nutrition “system” on note cards. This provided the more than 75 participants from universities, government agencies, research institutes, intergovernmental organisations, non-governmental organisations (NGOs), civil societies and the private sector the opportunity to identify potential pathways from water to nutrition from their respective vantage points.

The information gathered is expected to enrich the conceptual framework that IFPRI uses on water-for-nutrition linkages. The interactive session was followed by four oral presentations and discussions on irrigation-nutrition linkages: Insights from the Innovation Lab for Small Scale Irrigation (ILSSI) Project and Beyond by Dawit Mekonnen of IFPRI; Agriculture, Water Quality, Nutrition and Health by Muhammed Abdella Usman of ZEF; Multiple-Use Water Services and Improved Dietary Diversity in Rural Tanzania and Burkina Faso by Sara Marks of Eawag (the Swiss Federal Institute of Aquatic Science and Technology); and Improving Community-Led Total Sanitation through Experimental Games by Yaniv Stopnitzky of University of San Francisco.

Key findings

The presentation on irrigation-nutrition linkages by researchers from IFPRI explored the major

potential pathways through which irrigation can influence nutritional status. These potential pathways include: the production pathway, where irrigation provides the opportunity to grow in the lean season to increase production of animal foods through irrigated fodder and improve crop yields (especially with improved varieties and complementary inputs); the income pathway, since irrigation usually leads to higher gross revenue per hectare for small scale irrigators as it is used mainly for cash crops; the water-supply pathway, as irrigation water may be used for other purposes such as drinking, washing, bathing or other productive purposes (such as livestock watering and aquaculture); the health-risks pathway, where negative relationship between irrigation and nutrition may arise from increased risk of vector-borne diseases (such as malaria and dengue), depending on the source of water for irrigation and method of water application; and the gender pathway, where irrigation projects targeted at women may have differential impact on nutrition and health outcomes. This is because women may allocate resources gained from the sale of irrigated crops to food and health expenditures or use irrigation to grow more nutritious foods for home consumption, or because irrigation may directly contribute to women's empowerment (for instance, by increasing assets owned or income controlled by women), but have a potential negative effect due to time burden (depending on the type of irrigation technology or source of irrigation water).

The preliminary findings from an econometric analysis of irrigation-nutrition linkages by the

team from IFPRI using data from the ILSSI project in Ethiopia and Tanzania showed that access to irrigation significantly improves both household income and the diversity of crops that farmers produce. Increasing household income led in turn to higher dietary diversity, suggesting that the income pathway between irrigation and nutrition is at play; whereas the relationship between production diversity and dietary diversity is not statistically significant after controlling for the income effect of irrigation. Although further research is needed on why production diversity from irrigation does not directly translate into higher dietary diversity, the researchers hypothesize that this is possibly due to forgone income benefits from specialisation as farmers in the sample are, on average, producing up to seven different crops on cultivated land of less than two hectares.

The research from Eawag explores the impact of multiple-use water services (MUS) on the health and diet of rural households based on controlled-impact evaluation of two MUS programmes in rural Africa. The WA-WASH programme in Burkina Faso and the iWASH programme in Tanzania both delivered integrated water services to improve access to drinking water, support vegetable gardens, animal husbandry and many other activities. Results show that whereas food insecurity existed to some extent in all communities, the number of households self-identifying as food insecure was significantly lower in communities receiving MUS. In addition, a slight improvement in overall dietary diversity was observed in Tanzania as a

result of MUS. The research also found that animal-product consumption improved significantly as a result of MUS. Data for this study were sourced from USAID and the GLOWS programme, with support from Winrock, Florida International University and Eawag.

The research from ZEF brings another important dimension to the overall discussion as it explores the linkages between agriculture, water quality, nutrition and health using data from two districts in Ethiopia. The data from the two districts show that although households with access to irrigation have slightly better access to drinking water, spend less time collecting water and have higher per capita water consumption compared to non-irrigating households, the level of *E. Coli* per 100 ml of drinking water and exposure to malaria was higher among irrigators than non-irrigators. Irrigators in the sample had a higher overall morbidity than non-irrigators and children of irrigating households are more likely to be undernourished than children of non-irrigators. A significant number of households reported that they directly draw water from irrigation sources for household consumption. Similarly, household members working on an irrigated field may contaminate domestic water sources if proper personal hygiene and handwashing are lacking.

The research from University of San Francisco aimed to explore whether experience of playing a short experimental game, which was designed to mimic strategic interdependencies in sanitation and hygiene behaviour, might alter related preferences and behaviour. Looking at a cross-section of data, the authors were unable to ascertain whether playing the experimental game alters real-world behaviour, although they intend to pursue this question with follow-up surveys. However analysis of the game shows strong evidence that even a short, structured game can significantly alter a large set of preferences around sanitation and hygiene, and importantly at a very low cost compared to other types of interventions. See also: www.ifpri.org/publication/changing-preferences-through-experimental-games-evidence-sanitation-and-hygiene-tamil

Discussion and conclusions

The session has brought to light different dimensions of water-nutrition linkages. The main theme underlying all the presentations and discussion in the session is that agriculture-water-sanitation-nutrition linkages form a complex system that requires a mix of multiple instruments for success.

Given the complexity of these linkages, analysing a single pathway may lead to misleading

policy recommendations. Analysis therefore calls for a cautionary approach that exploits synergies and reduces trade-offs among potential causal linkages. For instance, small-scale irrigation can lead to higher nutritional status (measured as dietary diversity and food security), but the nutrition and food security dividend from small-scale irrigation requires that health, sanitation, nutrition and gender considerations are actively promoted during the design and implementation of irrigation development. On the other hand, widespread household water contamination in rural areas can undermine the progress made in increasing access to improved water supply in many developing countries.

The presentations and discussions in the session showed that the numerous pathways linking water, nutrition and gender are still insufficiently understood and call for the water, gender and nutrition sectors to work together to develop rigorous research exploring efficient approaches and to collaborate in developing effective programmes and policies to better ensure that the related Sustainable Development Goals (SDG) of zero hunger, gender equality and clean water and sanitation are achieved.

For more information, contact: Dawit Mekonnen, email: d.mekonnen@cgiar.org

Deterioration of children with MAM who have no access to supplementary feeding programmes

Summary of research¹

Location: *Ethiopia*

What we know: There is no consensus on how best to treat moderate acute malnutrition (MAM) in children; Supplementary Feeding Programmes (SFPs) are commonly used. In Ethiopia, SFPs are only implemented in selected woredas defined as chronically food insecure.

What this article adds: A recent study in two woredas of Ethiopia where no SFPs were in place investigated outcomes among moderately malnourished children. At baseline, the majority of households were food insecure (one third severely); over two thirds of enrolled children (median age 12 months) were stunted (47.3% severe, 20% moderate); 25.1% were moderately wasted; and 12.7% severely wasted. At endline (28 weeks), one third (32.5%) remained moderately malnourished; 9.3% had experienced at least one episode of severe acute malnutrition (SAM); and 0.9% had died. Only 54.2% of the children recovered from MAM with no episode of SAM by the end of the study. Children with the lowest MUAC at baseline had the highest risk of developing SAM or failing to recover from MAM. Independent predictors of relapse after recovery were MUAC, age, and weight-for-height z score (WHZ) at admission. Independent predictors of remaining MAM included MUAC and WHZ at baseline, wealth and maternal work indexes, feeding practice scores, WASH intakes and self-reported vitamin A intake. Further preventive and curative approaches should

Children with moderate acute malnutrition (MAM) have an increased risk of mortality, infections and impaired physical and cognitive development compared to well-nourished children. Consensus on how to manage MAM most effectively has still not been reached internationally, although targeted supplementary feeding programmes (TSFPs) are the most common approach, using a variety of supplements such as fortified blended flour and ready-to-use supplementary food (RUSF). Other approaches include nutrition counselling and increasing dietary diversity from existing natural food sources.

In Ethiopia, acute malnutrition remains an extensive and seemingly embedded problem. In 2011, 10% of children under five years old were acutely malnourished, 70% of whom had MAM (DHS, 2011). The current strategy in Ethiopia is to restrict SFPs for treatment of MAM to selected woredas (districts) of the country defined as chronically food insecure. In remaining woredas, there are no food supplementation programmes. The short-term outcomes of children who have MAM in such areas are not currently described; an urgent need for evidence-based policy recommendations remains.

¹ James P, Sadler K, Wondafrash M, Argaw A, Luo H, Geleta B, et al. (2016) Children with Moderate Acute Malnutrition with No Access to Supplementary Feeding Programmes Experience High Rates of Deterioration and No Improvement: Results from a Prospective Cohort Study in Rural Ethiopia. *PLoS ONE* 11(4): e0153530. doi:10.1371/journal.pone.0153530

Method

A recent observational, prospective cohort study was carried out with children aged 6-59 months with MAM living in two rural areas of Ethiopia with no access to SFP. The objectives of the study were to determine the proportion of recovery, non-response and deterioration to SAM; the incidence of mortality and SAM; and the average duration of the MAM episode. The Mana and Dedo woredas of Jimma Zone in south-western Ethiopia were selected to represent rural settings with no access to SFPs but where other health and nutrition services were delivered according to national policy. These services included the Integrated Management of Maternal, Neonatal and Childhood Illnesses (IMNCI), the Integrated Community Case Management of illness (ICCM), and the Community-based Management of Acute Malnutrition (CMAM) to treat severe acute malnutrition (SAM). Through the Enhanced Outreach Strategy (EOS), vitamin A supplementation and deworming treatment was scheduled for distribution in six-month campaigns. Immunisation, basic nutrition and sanitation counselling were provided through the health extension system.

In the study MAM was defined as mid-upper arm circumference (MUAC) of ≥ 11.0 cm and < 12.5 cm with no bilateral pitting oedema. SAM was defined as MUAC < 11.0 cm and/or bilateral pitting oedema. The research team surveyed 884 children aged 6-59 months living with MAM in a rural area of Ethiopia not eligible for a SFP. Children were identified during a 10-day (five days per woreda) exhaustive house-to-house MUAC and bilateral pitting oedema screening implemented by 82 trained community health volunteers (CHVs) in August and September 2013.



WFP/Michael Tewelde, Ethiopia, 2016

During the initial screening, 923 children were identified as eligible after determining their nutritional status and that they were not planning to move out of the study area. Forty data collectors then implemented a baseline household questionnaire within the following week and performed weekly home visits for the subsequent 28 weeks, covering the end of the peak malnutrition season through to the post-harvest period (the most food secure window). Anthropometric, socio-demographic and food security data were gathered. Final outcomes were assigned to children after 28 weeks of follow-up.

The baseline questionnaire was designed to capture potential predictors of the children's final outcomes and included child, household and caretaker-related variables. Child-related variables included sex, age at enrolment, feeding index, immunisation status, access to the EOS, common illnesses in the previous two weeks (diarrhoea, fever, cough, difficulty breathing), handwashing practices, bed net use and baseline weight, height and MUAC. Household variables included questions to assess wealth index, household size, main income-generating activity, food security status, water and sanitation questions, geographical access to primary healthcare, death of a family member and household head information. Caretaker-related variables included relationship to the child, age, educational status, occupation, work-burden index, access to and sources of information about recommended child feeding and care practices, handwashing practices, disposal of young child faeces, health-seeking behaviour and MUAC.

Weekly questionnaires were designed to track the cohort's anthropometric, mortality and morbidity profile over the follow-up period. Information was obtained on common childhood illnesses, weight, MUAC and development of nutritional oedema. Height was measured monthly. Both the baseline and weekly questionnaires were pre-tested and translated into Amharic and Afan Oromo languages. Any child who deteriorated to SAM at any point during the follow-up was referred to the nearest health facility for outpatient therapeutic feeding programmes as per existing national protocol and continued to be followed up.

Results

At baseline, the majority of households were categorised as food insecure, with a third experiencing severe food insecurity. Over two thirds of children were stunted (height for age z score (HAZ) < -2) at enrolment; 20% were moderately stunted and 47.3% severely stunted (HAZ < -3). One quarter (25.1%) of children were moderately wasted and 12.7% severely wasted (MUAC criteria). Morbidity was high as indicated by the proportion of children who experienced diarrhoea and cough in the past two weeks (28.4% and 28.2% respectively). By the end of the study follow-up, 32.5% (287/884) remained with MAM; 9.3% (82/884) experienced at least one episode of SAM; and 0.9% (8/884) had died. Only 54.2%

of children recovered from MAM with no episode of SAM by the end of the study. Of those who developed SAM, half still had MAM at the end of the follow-up period. The mean (95% CI) cumulative probability of recovering by the 28th week of follow-up without experiencing an episode of SAM was 65.9 (62.0-69.8)%. The median time to recovery was 9 (4-15) weeks. Children with the lowest MUAC at enrolment had a significantly higher risk of remaining with MAM and a lower chance of recovering.

In terms of predictors of outcomes, MUAC at enrolment was the only variable independently associated with risk of developing SAM during follow-up. Independent predictors of relapsing to MAM after recovering were MUAC, age and weight-for-height z score (WHZ) at admission. Independent predictors of remaining MAM throughout the follow-up period were MUAC, WHZ at admission, food insecurity level, child feeding practices score, WASH (water, sanitation and hygiene) practices (source of drinking water, child stools disposal practices), mother's working index, household wealth quintile and self-reported intake of Vitamin A in the previous six months.

Conclusions

The findings reflect that, while an area may not be classified as food insecure, sub-sets of the population may be; in this instance, households with a MAM child. This study highlights that nearly half of children who were suffering from MAM at the beginning of the post-harvest season either developed SAM or lived through the four months of best food security without recovering. Many are therefore in danger of entering the next hunger season in a highly vulnerable condition.

These risks are accentuated among those with low MUAC at enrolment. Furthermore, those children who do manage to recover take a long time to do so (nine weeks); such a prolonged exposure to MAM risks serious negative consequences for their health and development (Black et al, 2008).

The authors conclude that children with MAM during the post-harvest season in an area not eligible for SFP experience an extremely high incidence of SAM and a low recovery rate. Not having a targeted, nutrition-specific intervention to address MAM in this context places children with MAM at excessive risk of adverse outcomes. Further preventive and curative approaches should urgently be considered.

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Growth faltering in rural Gambian children after four decades of interventions: a retrospective cohort study

Summary of research¹Location: *Gambia*

What we know: Growth faltering remains common in children in sub-Saharan Africa; factors to alleviate this remain poorly understood, limiting intervention design.

What this article adds: A retrospective cohort study using routine growth-monitoring data for children under two years assessed trends in growth faltering in rural Gambia over four decades. Those studied received unprecedented investments in healthcare and nutrition-related infrastructure. Over 40 years, underweight or stunting proportions at two years of age halved and growth parameters improved. However, prevalence of low birthweight (12%), childhood stunting (30%), and underweight (22%) remained high. Wasting prevalence did not change and growth faltering between three months and 21 months was only marginally attenuated. A high threshold for water, sanitation and hygiene (WASH) improvements is likely necessary to impact growth faltering; environmental enteropathy may provide a missing link. More understanding is needed of missing contributors to growth faltering to guide development of new interventions.

Growth faltering remains common in children in sub-Saharan Africa and is associated with substantial morbidity and mortality. Rates of stunting have been declining, but there are still 159 million stunted children worldwide (WHO, 2017). The prevalence of stunting has declined most slowly in sub-Saharan Africa and the absolute number of children with stunting has increased due to population growth (WHO, 2017). Key elements of progress that alleviate growth faltering are poorly understood, thus limiting the design of interventions and the targeting of health and development inputs.

A retrospective cohort study was carried out using routine growth-monitoring data for all children whose date of birth had been recorded to assess trends in growth faltering in children younger than two years in the West Kiang region of Gambia during the past four decades. Three rural villages in the region (Keneba, Manduar and Kantong Kunda) have benefited from free healthcare provided by the UK Medical Research Council (MRC) for the past 40 years. Since the 1970s, there have been increasing levels of support and interventions such that these villages have benefited from unprecedented levels of nutrition-specific and nutrition-sensitive interventions compared with other such communities in rural, low-income settings.

Routine growth data from birth to two years of age were available for 3,659 children between 1976 and 2012. Z scores for weight-for-age (WAZ), length-for-age (LAZ), weight-for-length (WLZ), mid-upper-arm circumference (MUAC) and head circumference (HC) were calculated

using the WHO 2006 growth standards. Seasonal patterns of mean Z scores were obtained by Fourier regression. Growth faltering was defined as fall in Z score between three months and 21 months of age.

Results

Results reveal secular improvements in all postnatal growth parameters (except weight-for-length), accompanied by declines over time in seasonal variability. The proportion of children with underweight or stunting at two years of age halved during four decades of the study period, from 38.7% (95% CI 33.5–44.0) to 22.1% (19.4 to 24.8) for underweight and 57.1% (51.9–62.4) to 30.0% (27.0–33.0) for stunting. However, prevalence remained unacceptably high. Postnatal growth faltering also persisted, leading to poor nutritional status at 24 months (LAZ -1.36 , 95% CI -1.44 to -1.27 , WAZ -1.20 , -1.28 to -1.11 , and HC Z score -0.51 , -0.59 to -0.43). These infants characteristically were born small and continued to fall away from the WHO standard length centiles throughout the first two years of life, despite weight showing early catch-up while the infants were still fully breastfed and largely protected from infections (the trend for which is magnified in their WLZ due to simultaneous decline in length). MUAC and head circumference were similarly resilient. Growth failure is markedly seasonal in this environment, with greater deficits occurring in the rainy season. The incidence of diarrhoea, malaria and bronchiolitis in the children younger than 12 months fell by 80% during the four decades studied, while the incidence of pneumonia seemed to increase.

Discussion

During almost four decades, the MRC has made sustained investments in healthcare and nutrition-related infrastructure in the core study villages; these inputs are unparalleled across rural Africa and would be prohibitively expensive for governments of low-income countries to roll out nationwide. These villages have access to antenatal and postnatal care and round-the-clock access to clinicians and nurses in a well-equipped and efficient primary healthcare clinic. All health services are free of charge. All children are fully vaccinated, receive vitamin A, mebendazole and other health interventions as per WHO protocols. Breastfeeding rates are among the best worldwide and are further supported by baby-friendly community initiatives, accompanied by regular messaging in support of exclusive breastfeeding for six months.

Open defecation and water obtained from contaminated open wells have been universally replaced by latrines in all compounds and tube well water supplied through clean pipes to standpipes around the villages. Studies have shown that these interventions have had a profound effect on mortality in children under five years old (Rayco-Solon et al, 2004) and the incidence of most diseases, especially diarrhoea, which has previously been implicated as a major cause of growth failure (Poskitt et al, 1999).

In addition, children attend regular well-baby checks with growth monitoring and a dedicated treatment centre for severely malnourished children is provided to treat those who do become malnourished. The remittance economy from village members who have migrated overseas, together with incomes from employment at the MRC, have greatly improved food security and attenuated the stress of the so-called hungry season, as reflected in the reduction in the amplitude of seasonal growth faltering in the region. This increased wealth has also improved housing conditions and dispersed families over a wider area, reducing overcrowding. Child mortality has fallen, birth spacing has increased and family size has decreased.

Despite the unprecedented levels of investment, the prevalence of low birthweight (12%), childhood stunting (30%), and underweight

¹ Nabwera HM, Fulford AJ, Moore SE and Prentice AM. (2017). Growth faltering in rural Gambian children after four decades of interventions: a retrospective cohort study. *The Lancet Global Health*, Volume 5, No.2, e208–e216, February 2017. Available open access at: <http://thelancet.com/journals/langlo/>

(22%) remains high. The prevalence of wasting has not changed and growth faltering between three months and 21 months has only been marginally attenuated. These data suggest that the refractory stunting must be caused by factors beyond the improvements and interventions provided in the study villages. Environmental enteropathy affecting almost all children in low-income settings has been proposed as the mechanism linking growth failure with WASH (water, sanitation and hygiene) deficits (Dangour et al, 2013). Results suggest that there is a very high threshold for WASH improvements that must

be achieved before growth faltering can be eliminated. Improved housing conditions, including piped water, might be a necessary step. More understanding is needed of the missing contributors to growth faltering to guide development of new interventions.

A comment on this study is also published in the same issue. Crane, R. J. and Berkley, J.A. (2017) Progress on growth faltering. The Lancet Global Health, Volume 5, No.2, e125-e126, February, 2017. Available open access at: <http://thelancet.com/journals/langlo/>

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Women's empowerment through food security interventions: a secondary data analysis

By Elizabeth Hohenberger



Elizabeth Hohenberger is a Master's student in International Agricultural Development at the University of California, Davis. She recently completed her fellowship with the Research and Innovation Fellowship for Agriculture (RIFA), when she worked with the USAID Feed the Future Zambia Mawa Project to measure its impacts on women's empowerment.

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Location: *Zambia*

What we know: Women's empowerment impacts on family food security and nutrition.

What this article adds: In Zambia, a CRS-managed, integrated food-security activity targeted key elements of gender inequality that contribute to undernutrition and economic security in 37,000 rural households over five years. A small qualitative study investigated impact on women's empowerment, defined using the Women's Empowerment in Agriculture Index (WEAI) and local definitions. Positive impacts on women's empowerment included greater control over agriculture production, resources and income; men more involved in household chores; and more nutritious child feeding. Men accepted women's empowerment where it led to household development – better child health, improved agricultural production, and increased income. Fears regarding women's empowerment related to risk of laziness and divorce (where men's role as head of household was challenged). For most success, projects to empower women should address broader development goals to increase nutrition and health for children.

Current situation

In Zambia, barriers to women's control over land, assets and income cut across the challenges of poor agricultural growth and poor nutrition. The Feed the Future Zambia Mawa Project (2012–2017), managed by Catholic Relief Services (CRS), is an integrated food-security activity

linking improvements in both health and nutritional status with improvements in food and economic security. Mawa engages with rural households through nutrition and health services, agricultural extension and community-based savings groups to target key issues of gender inequality which contribute to undernutrition and

access to capital. The project has worked with over 37,000 households and their community leaders to support changes in gender dynamics that affect nutrition and economic security.

When asked, project staff and representatives of the Zambian Ministry of Community Development familiar with the project say that it has empowered women in Mawa communities. They have observed women, with the support of their partners, participating in activities they had never previously engaged in, such as using their own money to pay school fees. While the project saw the impact of engaging in gender-responsive activities, they did not have a way to measure how the project was empowering women. Thus Mawa partnered with a graduate student from the UC Davis Research and Innovation in Agriculture Fellowship (RIFA) to measure the project's impact on women's empowerment. The findings are summarised in this article.

Defining and measuring women's empowerment

Two approaches were used to define women's empowerment. The first involved the Women's Empowerment in Agriculture Index (WEAI) for general parameters. The WEAI is used to measure women's empowerment in five areas, as compared to control by men: control over agriculture production; access to and control over productive resources; access to and control over income; leadership in the community; and time use. Local definitions (see below) gave context to the five areas of the WEAI and allowed men and women to share local priorities and perceptions of women's empowerment.

The second approach was to ask men and women in Mawa communities for their own definitions. Both genders defined women's empowerment in ways that aligned, for the most part, with the WEAI. They expressed the belief that women's empowerment is the inclusion of women in decision-making and budgeting income (decisions over agriculture production, access to and control over productive resources, access to and control over income), as well as the participation of men in household tasks to reduce women's labour (time use). Outside the WEAI, women and men also stated that women's ability to feed children nutritious food was an example of women's empowerment.

Together, Mawa and RIFA identified households from four different Mawa groups: those

in farmer groups; mothers receiving home visits from nutrition volunteers in care groups; members of savings and internal lending communities (SILC); and participants in gender education.

Members of the Zambian Ministry of Community Development were trained to conduct single-gender Focus Group Discussions (FGDs) with each of the identified groups. These discussions were used to learn about local definitions of women's empowerment, time use and expenditure priorities and responsibilities. Individual interviews with 15 households were conducted to explore topics shared in the focus groups.

Mawa's impact on women's empowerment

Control over agriculture production, access to and control over productive resources, access to and control over income

All 15 households interviewed stated that women are now involved in budgeting and keeping of money after participating in Mawa, whereas previously they had not been. One woman told us, "[Before Mawa] my husband went to sell and I had no knowledge of the money...[now] after selling, my husband comes home with the money and sits with me" to make a budget. Men are happy about including their wives in budgeting because they feel that men are bad at keeping money; when women are involved, there is more development in the household. Focus groups of men explained this, saying "Women have good ideas for development in the home," and that men are "careless with money and can spend it on beer." One man explained in his interview that "women won't spend money anyhow," and that his wife will be able to "purchase things for the family, even when I am not around." Women's larger voice in income has led to an increase in decision-making in agricultural production and productive resources. They are able to help their husband's prioritise fertilizer and seed during budgeting. Furthermore, women participating in SILC see an even greater control over income in that many set aside money to invest in their savings groups during household budgeting, or contribute

their annual share to purchase farming inputs and other important expenditures.

Time

Men and women in 13 households say that women are receiving more help with household chores, either from their husbands or from their children, after participation in Mawa. Dramas performed by focus groups depicting life before Mawa showed women and children doing all the field and household work. However, in interviews, men and women say that because of Mawa, men have seen that their wives have a lot of work to do and have begun helping in household chores. Reduced workload has increased the time available to women to rest and to participate in other Mawa activities. Men and women say that it is important for women to rest to regain strength. Men say that they do housework to let their wives rest.

Nutrition

Households in which the wife participates in a care group had a greater focus on improved nutrition and health of their children when discussing women's empowerment. Men and women say they "know how to feed their children nutritious food now, as compared to before Mawa". Including men in these discussions has led to an increased prioritisation of children's health and increased participation of fathers in household chores related to childcare. As a result, women are finding the time to rest and care for themselves. Rest during pregnancy has a direct impact on the health of the child and may contribute to men's incentives to help their wives rest.

Criticisms and fears about women's empowerment

During the focus group discussions, men and women expressed a concern that women's empowerment can make women lazy or lead to divorce. During interviews, participants told us that women's empowerment and sharing of housework could lead women to demand that men work more, while women "just sit." One woman told us that women may think they have "more power in the house because of empowerment." Men said that if women don't come to the field when men do, women are lazy. Men

state they are the heads of the household and pay the bride price, so if women think they have more power than their husbands, they will divorce. Men do not want to relinquish their position as head of the household.

Men are happy including women in decision-making and budgeting and participating in household chores when the result is development in the household. They see the impact in the improved health of children, improvement of agricultural production and increase in income. Yet it is important to note that during focus group discussions and interviews, both men and women emphasize men as the head of the household and the one who has more power. Eleven households stated that the man makes most of the decisions because he is the head of the household. There is genuine fear that women may become "more powerful" than their husbands and inclusion of women in decisions regarding the household and income come with limitations.

Discussion

This small study is consistent with observations from project monitoring visits and Field Supervisor's monthly reports. For example, husbands have shared stories about times when they were away from home and their wives made sales (of maize) in their absence to generate cash for important expenses around the house. The men were relating this as a good thing when, in some communities, a woman could be beaten for taking such a decision without her husband's instruction. Both men and women appreciated the value of being able to share responsibilities flexibly, depending on who is available and trusting that the other will do the right thing with the resources for the family's wellbeing. When discussing joint budgeting and planning, men often point out that women remember and prioritise different things, which helps the whole family consider a broader set of needs.

The increased inclusion of women in these responsibilities demonstrates an understanding that women are contributors to the household, too. Men are also recognising the positive effects of their own contributions to home care. The result is an increased cooperation within the family in both productive and reproductive responsibilities, a key ingredient in promoting the "household development" that focus groups and interviewees lauded as a benefit of gender equality.

Men's concerns about weakened authority in the household, however, can impede projects that hope to be gender-transformative and include stand-alone or explicit women's empowerment in their objectives. Focus on equal contribution to household development and overcoming gender-barriers to increase nutrition and health for children in project messaging will have better success in impacting the areas of the WEAI than aiming to empower women without also addressing these broader goals.

For more information, contact:
Elizabeth Hohenberger, email:
emhohenberger@ucdavis.edu



Women perform dramas during FGDs about women's empowerment

Elizabeth Hohenberger, Zambia, 2016

Improving estimates of numbers of children with severe acute malnutrition using cohort and survey data

Summary of research¹

Location: *Mali, Niger and Burkina Faso*

What we know: National prevalence data is used to estimate the burden of severe acute malnutrition (SAM). Incidence is a more accurate measure of the burden of acute conditions such as SAM, but is more costly and time-consuming to obtain. An incidence-correction factor of 1.6, to estimate incidence from prevalence, is currently recommended.

What this article adds: A recent study developed an incidence-correction factor to estimate SAM burden from prevalence estimates and tested it with data from Mali, Niger and Burkina Faso. A pooled incidence-correction factor of 4.82 was estimated, generating a corrected SAM-burden estimate of 110.6 million (from 19 million). Country-specific incidence-correction factors varied between countries and over time, indicating context matters. Given this, a common incidence-correction factor is unlikely to be adequate. Country-level estimation of the incidence-correction factor using both survey and routine programme data with an estimate of programme coverage is necessary in the absence of prospective cohort studies.

Severe acute malnutrition (SAM) is reported to affect 19 million children worldwide (Black et al, 2013). This estimate is an extrapolation from 639 national surveys determining the prevalence of SAM in 142 countries. SAM is an acute condition, however, and affected children may recover or die within a few weeks. One consequence is that estimation of the burden of SAM by means of prevalence data collected in occasional cross-sectional surveys

will miss some cases and underestimate the number of children affected. The burden of acute conditions like SAM is more appropriately represented by a measure of incidence that captures new cases over time. While prevalence estimates are relatively easy to obtain using cross-sectional surveys, estimates of incidence require longitudinal follow-up of a cohort and are more costly and time-consuming to obtain. In the absence of incidence data, a simple method for estimating

disease burden has been proposed that corrects available prevalence estimates to account for incident cases using an “incidence-correction factor” (UNICEF, 2013).

In this study, the authors used data from three West African countries (Mali, Niger and Burkina Faso) to test the hypothesis that a common incidence-correction factor may be used for estimation of SAM burden in all settings. The incidence-correction factor was estimated by the authors within the epidemiological framework described in Box 1. Meta-analysis was performed to calculate summary estimates for each country and for all three countries. Heterogeneity between countries and years was assessed using the I statistic.²

Findings

Prevalence and incidence data were available for multiple years in the three countries: Mali (2010-2012), Niger (2010-2011), and Burkina Faso (2009-2010). A pooled incidence-correction factor of 4.82 (95% confidence interval (CI): 3.15, 7.38) was estimated, although there was substantial between-country heterogeneity (I² = 69%, P = 0.004). Within countries, there was evidence of heterogeneity over time in Niger (I² = 80%, P = 0.02), where the country-specific incidence-correction factor ranged from 5.00 to 8.10. In contrast, there was no evidence of substantial heterogeneity across years in Mali or Burkina Faso; the pooled estimate of the incidence-correction factor was 2.53 (95% CI: 1.64, 3.89) in Mali and 13.25 (95% CI: 4.34, 40.48) in Burkina Faso. In secondary analysis, it was found that application of a mid-upper arm circumference (MUAC)-only definition of SAM (e.g. MUAC < 115 mm or oedema) resulted in little change in the incidence-correction factor compared with the primary analysis in Niger (K = 6.17 (95% CI: 3.86, 9.87) vs. K = 6.71 (95% CI: 4.81, 9.36)) or Mali (K = 2.53 (95% CI: 1.64, 3.89) vs. K = 2.67 (95% CI: 1.57, 4.57)). Variability in estimates was greater with cohort data than with survey data in Niger but lesser with cohort data in Mali.

Applying the pooled incidence-correction factor to the current global burden of SAM, the reported burden of 19 million children with SAM

Box 1 Epidemiologic framework for estimation of disease burden

In a steady-state population and when a disease is uncommon and duration of disease is constant, prevalence is a function of incidence and the inverse of the average duration of the disease (equation 1). When two of the measures are known, the third can be calculated (equation 2). Specifically, incidence can be approximated with data only on prevalence and the incidence-correction factor, K (equation 3). The burden of SAM is defined as the total number of SAM cases in a population during a specific period. The burden of SAM is therefore calculated as shown in equation 4. Through substitution using the incidence-correction factor, the burden calculation simplifies to equation 5 and equation 6. Current guidance recommends the use of K = 1.6 to calculate the one-year incidence from a given prevalence (where 1.6 is 12 months/7.5 months and 7.5 months is the only empirical estimate of the average duration of untreated SAM).

$$\text{Prevalence } (p) = \text{incidence } (i) \times \text{average duration of disease } (D). \quad (1)$$

t = the period for which incidence is estimated (e.g., 12 months).

$$\text{Incidence } (i) = \text{prevalence } (p) \times \frac{t}{\text{average duration of disease}}. \quad (2)$$

$$\text{Burden} = \text{population}_{6-59 \text{ months}} \times [\text{prevalence} + \text{incidence}]. \quad (4)$$

$$\text{Incidence } (i) = \text{prevalence } (p) \times K, \text{ where } K = \frac{t}{\text{average duration of disease}}. \quad (3)$$

$$\text{Burden} = \text{population}_{6-59 \text{ months}} \times [\text{prevalence} + \text{prevalence} \times K]. \quad (5)$$

$$\text{Burden} = \text{population}_{6-59 \text{ months}} \times [\text{prevalence} \times (1 + K)]. \quad (6)$$

¹ Isanaka S, Boundy EO, Graise RF, Myatt M and Briend A. (2016). Improving Estimates of Numbers of Children With Severe Acute Malnutrition Using Cohort and Survey Data. American Journal of Epidemiology Advance Access, published November 17, 2016. DOI: 10.1093/aje/kww129

² A statistic that indicates the percentage of variance in a meta-analysis that is attributable to study heterogeneity.

would be corrected to 110.6 million (95% CI: 78.9, 159.2) children affected. Given the variation in the incidence-correction factor across place and time found, the authors suggest the use of a common correction factor of 1.6 would still substantially underestimate the number of children in need and the importance of this condition.

Statistical heterogeneity suggests differences in the incidence-correction factor across settings; the pooled estimate in Mali ($K = 2.57$, 95% CI: 1.65, 4.00) was lower than that in Niger ($K = 5.59$, 95% CI: 3.31, 9.44). This between-country heterogeneity is consistent with the hypothesis that the relationship between prevalence and incidence is context-specific and may be related to differences across data sources or more general contextual differences. For example, the cohort in Mali included younger children aged 6-23 months and follow-up every three months. If incident cases were more likely to be missed in this context (due to the frequency of follow-up, for example), the incidence-correction factor would have been underestimated here. Similarly, if cases were systematically identified earlier or with fewer medical complications due to improved community-based screening or health infrastructure in Niger, the duration of SAM

may generally be shorter and the incidence-correction factor larger in Niger.

There has been great interest in the expanded use of MUAC in the management of SAM. It has been suggested that use of MUAC as the single anthropometric criterion for screening, admission, monitoring and discharge would simplify management protocols, as well as target those children at highest risk of death (Briend et al, 2012), but the transition to MUAC-based management has been slowed by uncertainty surrounding the operational implications of such a change. This study shows that use of a SAM case definition employing MUAC as the sole anthropometric criterion did not materially change the estimates of the incidence-correction factor for burden estimation.

Given the potential for considerable variation in the prevalence-incidence relationship across place and time, the authors conclude that estimating the burden of SAM with a common incidence-correction factor is unlikely to be adequate. There is instead the need (as a minimum) for country-level estimation of the incidence-correction factor using a combination of survey and routine programme data with an estimate

of programme coverage as an alternative to the optimal prospective (e.g. cohort) investigations. The Integrated Disease Surveillance and Response approach proposed by the World Health Organization Regional Office for Africa, which promotes the integration of multiple surveillance systems and recommends routine MUAC assessment, may also be a practical platform to obtain routine data on SAM incidence. Policy-makers and programme managers should be encouraged to explore inclusion of such sources of routine data collection so that context-specific estimates can be developed. In the absence of forthcoming data, estimates provided in this analysis may be considered for estimation of SAM burden in the countries studied.

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Invited commentary: improving estimates of severe acute malnutrition requires more data

Summary of commentary¹

Authors of an invited commentary on a recent paper by Isanaka et al (2016), that described development of an updated incidence-correction factor for severe acute malnutrition (SAM), reflected their surprise on the lack of high-quality data supporting global estimates of SAM burden in children. This prompted an online search for a few more cohorts that could have contributed longitudinal data to the meta-analysis, but yielded no further results. They conclude this study makes a huge contribution to literature on SAM incidence in children.

The reviewers highlight the challenge of developing a single-figure estimate of SAM burden, and identify inconsistencies in estimates – 19 million in 2013 (Lancet) has become 17 million in 2015 (UNICEF), likely due to different assumptions and methods, rather than a true reduction in burden of 2 million children. A good example of this discrepancy is presented by Isanaka et al. when they extrapolate their pooled incidence correction factor to the reported burden of 19 million SAM-affected children, which corrects this figure to over 110 million.

Examining the methodology used by the

researchers, they consider use of the parametric bootstrap approach as “smart and valid”. They are less clear how a standard error was generated, for use in the random-effects meta-analysis; from this bootstrapped confidence interval, but considering the underestimated heterogeneity that may arise is unlikely to affect interpretation of results.

This paper is an important stepping stone in burden estimation. A single and outdated incidence correction factor has now been updated to three distinct incidence correction factors, one per region. However, even the accuracy of these more specific values will vary depending on case definitions, seasonality of data, ages of the children assessed, follow-up interval, and many other variables. As treatment opportunities and resources improve, SAM prevalence should decline over time and the incidence correction factor will increase. However, the duration can also be shortened by increased mortality, so careful monitoring is needed. Where SAM treatment programmes and admission data already exist, the reviewers suggest to extrapolate targets based on the number of admissions in the previous year, as an alternative to indirect estimates. These should take into ac-

count seasonality, geographic expansion plans, predicted increases in treatment coverage based on programme activities and adjustments, and completeness of reporting.

The authors conclude with some thoughts regarding greater securing data, which they consider as “public health in practice”, rather than pure epidemiology. As well as the need for more cohort data, it is also important to consider within each cohort the duration of time to follow-up. More frequent monitoring would enhance confidence in the estimates.

¹ Hure, A, Oldmeadow C, and Attia J (2016). Invited Commentary: Improving Estimates of Severe Acute Malnutrition Requires More Data. *American Journal of Epidemiology Advance Access*, published November 17, 2016. DOI: 10.1093/aje/kww131

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UNICEF call for data sharing for incidence analysis

UNICEF has issued a request to organisations to share data to inform an analysis of the incidence of severe acute malnutrition (SAM) at country level. This analysis aims to strengthen global guidance on estimating the burden of SAM and programme caseloads.



WFP/Michael Tewelde 2016

Problem statement

The estimated number of SAM cases (SAM burden) guides priority-setting and programme planning for human, institutional and financial resources. Current guidance defines the burden of SAM as the sum of the existing (prevalent) cases and the new (incident) cases, but in the absence of incidence data, practical calculation of the SAM burden often relies on prevalence of SAM and an ‘incidence correction factor’. Technical limitations related to the incidence correction factor remain. These are: the incidence correction factor included in current guidance of 1.6 was developed based on historical data from two sites. Programme experience and recent analysis¹ now suggest that there is considerable variation between countries and this value may be inadequate. Routine survey, programme and surveillance or cohort data may be useful to generate updated and country-specific SAM incidence correction factors.

Aims

UNICEF aims to build the evidence base for incidence of SAM in different countries and contexts to improve estimation of the SAM

burden and programme planning and is calling on implementing actors in the global nutrition community to provide survey, programme, surveillance and cohort data for this purpose. By generating country-specific incidence correction factors, this analysis will help us understand if, how and the extent to which the incidence correction factor for SAM varies between countries in order to improve global guidance and programme planning tools. Specific questions will include:

- What are the gaps in the distribution and quality of available data for SAM incidence?
- Where data exists, to what degree does SAM incidence vary between countries?
- Where data exists, to what degree does SAM incidence vary sub-nationally and seasonally?
- What are the minimum capacity and data requirements to generate country-specific SAM incidence figures?
- What are the potential implications of variations in SAM incidence factors on global modelling and joint estimates of SAM burden?

Other limitations to the global guidance, such as the discrepancy between prevalence based on weight-for-height versus MUAC, require further work through other processes.

This work will be undertaken by UNICEF under the guidance of a Technical Advisory Committee and will be shared with agencies contributing data, national governments and other key stakeholders. The overall purpose of the work is to improve methods for generating SAM burden estimates and update global guidance for SAM programme planning. Given UNICEF’s commitment to working with national governments and partners on scaling up SAM management globally, improved tools that will enable country-level staff to improve programming and planning are a priority.

Your help is needed

There are three pathways to contribute data (see Table 1). These data or reports may already exist within your organisation. UNICEF is happy to work with you to help identify the data (including the format and variables) or reports that will be most useful for this analysis. Even if your agency does not have all the required data within each pathway, data from your organisation may complement sources from other agencies.

Any raw data shared by your organisation will be checked and cleaned, as well as verified to ensure there is no duplication with other or existing datasets. In return for the data shared, UNICEF will acknowledge your organisation in any reports produced. UNICEF will also return files provided in a cleaned format if requested.

Raw data provided will not be used for any other use than that stated and it will not be shared with any third party. Only de-identified (i.e. anonymous) data without personal identifiers will be accepted to minimise risk of identification of individuals. A standard project agreement letter will be signed between your organisation and UNICEF for any raw data shared.

Table 1 Pathways to contribute data for analysis

	Prevalence	Incidence
Pathway 1	Nutrition survey data or reports (e.g. SMART surveys) with estimates of the prevalence of SAM and the total population of children aged 6-59 months.	Routine programme data or reports with the number of admissions in the SAM treatment programme over a minimum of 12 consecutive months following the survey data. Coverage survey data or reports including an estimate of the proportion of children aged 6-59 months with SAM covered by the programme.
Pathway 2	Nutrition survey data or reports (e.g. SMART surveys) with estimates of the prevalence of SAM and the total population of children aged 6-59 months.	Surveillance or cohort data with the number of new SAM cases detected and the number of children screened at each round of measurement over a minimum of 12 consecutive months following the survey data. (Anthropometric screening is ideally conducted on a monthly basis.)
Pathway 3	Surveillance or cohort data with the number of new SAM cases detected and the number of children screened at each round of measurement over a minimum of 12 months following the survey data. (Anthropometric screening is ideally assessed on a monthly basis.)	

The call for data runs from February through to end March 2017. For more information, please contact Louise Mwirigi, email: lmwirigi@unicef.org or the programme manager at nutritiondata@unicef.org

¹ Isanaka S, O’Neal Boundy E, Graise RF, Myatt M and Briend A. (2016). *Improving Estimates of Numbers of Children With Severe Acute Malnutrition Using Cohort and Survey Data*. American Journal of Epidemiology Advance Access, published November 17, 2016. DOI: 10.1093/aje/kww129. See summary in this issue (54) of *Field Exchange*.

Improving community management of uncomplicated acute malnutrition in infants under six months (C-MAMI): developing a checklist version of the C-MAMI tool

Summary of MSc project report¹

By Sonja Read

Sonja Read is a public health nutritionist from the London School of Hygiene and Tropical Medicine. She has previously worked in various support functions across different NGOs. With a background in strategic management, her passion is to contribute to effective programming and nutrition interventions.

This research was carried out as part of a Master's dissertation. The author would like to acknowledge Dr Marko Kerac, who supervised the research, for his support throughout the project, and Marie McGrath and Nichola Connell for their input, especially at the conception stage. Thank you to Malawi Epidemiology & Intervention Research Unit for hosting the research, especially to Professor Moffat Nyirenda and Dr Amelia Crampin.

Location: *Malawi*

What we know: WHO recommends treating uncomplicated acute malnutrition in infants <6 months in an outpatient setting; few countries have implemented these guidelines. The C-MAMI tool was developed to help identify, assess and manage malnourished and at-risk infants <6m of age at community level. It has not yet been field-tested.

What this article adds: A study developed checklist versions of the assessment part of the C-MAMI tool and tested these and the full tool with Malawian health workers. The tool was regarded by health workers as necessary to fill an existing gap and could improve case identification and management. A shorter checklist version was largely preferred for the assessment of malnourished and at-risk infants <6m in programmatic contexts. Many reported difficulties using any form of the tool for the first time, e.g. anthropometric/nutritional assessment resulted in different treatment outcomes for the same child; several checklist items were interpreted differently; and boundaries between categories 'severe' and 'moderate' were often unclear. Recommendations include developing a management guide with support actions to accompany a C-MAMI checklist; clear definitions; and well-designed training for community health workers.

The management of malnutrition in infants under six months (infants U6m) poses several challenges compared to older children. The exclusive breastfeeding norm and physiological/development immaturity in the age group excludes them from the use of ready-to-use therapeutic food (RUTF) as a principal treatment. Breastfeeding practices and related problems, as well as the mother's physical and mental status, need to be assessed and potentially addressed (McGrath, 2016). Perhaps due to these challenges, only one out of 46 country SAM guidelines recently reviewed recommend outpatient management of uncomplicated infants U6m, despite the WHO recommendation to do so (McGrath, 2016).

The C-MAMI (community management of acute malnutrition in infants U6m) tool¹ was developed by ENN and the London School of Hygiene of Tropical Medicine (LSHTM) in a multi-agency/expert collaboration as a first step in adapting the WHO recommendation into a more operational form for front-line practitioners. Developing a checklist version of the C-MAMI tool is particularly important to make it as

simple, fast and effective as possible for health workers in communities (ENN et al, 2016).

Methods

Two checklist adaptations of the C-MAMI tool were developed and piloted with the original tool in semi-structured interviews involving role play and observational data-gathering with health workers from hospitals, clinics and the community in Malawi. Data were analysed with framework and thematic analyses. Key informant interviews, including with the original tool developers, and semi-structured interviews were used to refine a C-MAMI checklist.

Results

Six themes emerged from the semi-structured interviews (n=24), key informant interviews (n=5), completed checklists and observations.

General impressions about the tool

All health workers interviewed welcomed the tool but nearly half (n=11, 46%) found first-time use difficult or considered frequent use was necessary to use it effectively. There were contradictory statements regarding the workload that the tool would add. Compared to current



practice, the tool was described as systematic and comprehensive. Most respondents preferred the checklists due to their simplicity.

Training needs

All respondents agreed that training is necessary in order to use the tool effectively. Assessment outcomes varied between respondents and items in the checklist were interpreted in different ways, further suggesting training is needed.

Difference made by the tool

More malnourished infants U6m could be identified and managed as no standardised way of doing this currently exists. The comprehensiveness of the tool would help identify problems, especially those that are not explicitly expressed by the mother. Health workers would cover some but not all items on the checklist. Community-based care was thought to have benefits

¹ The full MSc report is available at: [www.lshtm.ac.uk/library/resources/msc_projects/under Nutrition for Global Health \(formerly Public Health Nutrition\) >> 2016](http://www.lshtm.ac.uk/library/resources/msc_projects/under_nutrition_for_global_health_(formerly_public_health_nutrition)_>>_2016).

² C-MAMI tool version 1.0, November, 2015. A full version is free to download at www.ennonline.net/c-mami.

to the mother, saving time and money. Many respondents said they were keen to be able to handle such infants instead of having to refer them for inpatient treatment.

Potential difficulties

There was great variation in how the anthropometric/nutritional assessment was understood and completed, resulting in various treatment implications (inpatient vs outpatient) for the same scenario. Classification by weight-for-length z-scores (WFL) was particularly difficult for participants; most respondents skipped it. When probed for reasons why, interviewees mentioned unfamiliarity with the measurement and z-scores and confusion with weight-for-height. Many found the anthropometric/nutritional assessment difficult.

There are some discrepancies between current practice and the tool; e.g. wet nursing was discouraged by health workers, who also advised that lack of breastmilk was linked to mother's diet.

Differences among health workers in understanding the tool emerged as an important factor in how the tool will be received. Respondents pointed out that some health workers have difficulties in understanding new things, while others are much quicker to grasp new practices.

Using and interpreting the tool

There was a great deal of variation in how questions were posed and interpreted. Differences between diagnostic categories were not always clear to respondents, especially the difference between 'severe' and 'moderate'. They were sometimes unsure whether they should classify based on observation or history; e.g. diagnosis of weight gain was different based on maternal report versus comparing birthweight to current weight.

Non-breastfeeding assessment and support

Non-breastfeeding is one of the most sensitive parts of the assessment and it divided opinions among key informants. All key informants agreed that the non-breastfeeding assessment should be on the checklist, but opinions differed

as to where it should be positioned in the tool (i.e. middle or end). In the non-breastfeeding role play respondents often advised the mother to breastfeed, but no one identified relactation as a support action.

Discussion

The results of this study confirm the need for a community-based model of care for this age group (Angood et al, 2015) and substantiate previous findings which show that infants U6m with feeding problems are currently being neglected by health systems (McGrath, 2016). In Malawi, the tool would fill an existing gap and present a viable and welcome option in ensuring infants and feeding problems are not missed. Training is essential.

This study supports previous findings that WLZ is a troublesome measurement in infants U6m (Mwangome et al, 2016) and alternatives should urgently be explored for easier identification of at-risk infants. Clarifying the meaning of each checklist item is likely to avoid much of the variation in assessment outcomes. At implementation, practical considerations should inform adaptation to contexts. For example, community workers in Malawi currently do not conduct clinical assessments. Even with the C-MAMI tool, non-breastfeeding cases may be difficult to manage and viable options will depend greatly on the context.

The study recommends the following actions to support implementation:

1. Use of a C-MAMI checklist to identify and assess malnourished and at-risk infants U6m, accompanied by a support-action booklet containing the management actions;
2. Well-designed training needs to be carried out when implementing the C-MAMI tool and due attention should be given to the anthropometric/nutritional assessment;
3. Use of WLZ in infants U6m should be reviewed;
4. Each item in the tool needs to be clarified and clearly defined, including how information is to be collected (history vs. observation), e.g. in a training guide.

Further research should put greater focus on the management part of the C-MAMI tool and test the implementation of the tool in programmes.

For more information or to get a copy of the checklist, contact:
sonja.read1@alumni.lshtm.ac.uk



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I Assessment Sample from the checklist: Assessment: Infant					
Ensure the child has been assessed for IMCI danger signs and that any life-threatening problems have been addressed (see IMCI).					
1. Antropometric/Nutritional Assessment (tick <input checked="" type="checkbox"/> where appropriate)					
Growth monitoring card?		<input type="checkbox"/> Not available, record weight for age:			
		<input type="checkbox"/> Yes			
CLASSIFY	Pink Severe problem	Yellow 1 Moderate problem	Yellow2 Some problem	Green Not urgent	ACTION
Weight-for-length	-	<input type="checkbox"/> <-3	<input type="checkbox"/> >= -3 to <-2	<input type="checkbox"/> >= -2	
Recent weight loss	<input type="checkbox"/> severe	<input type="checkbox"/> moderate	-	<input type="checkbox"/> none	
No weight gain	<input type="checkbox"/> prolonged (two weeks)	<input type="checkbox"/> recent (days-weeks)	-	<input type="checkbox"/> normal	
Dropping centiles on growth chart	<input type="checkbox"/> sharp	<input type="checkbox"/> moderate	-	<input type="checkbox"/> none	
Oedema	<input type="checkbox"/> yes	-	-	<input type="checkbox"/> no	
Non-responder	<input type="checkbox"/> yes	-	-	<input type="checkbox"/> no	
MEASURE	Record Mid Upper Arm Circuferemce (MUAC) (for o-going and future studies)				

Cost-benefit analysis of a kitchen-garden intervention in Pakistan

Summary of research¹

Location: *Pakistan*

What we know: Kitchen gardens are an intervention intended to impact nutrition positively by increasing year-round access to nutritious foods.

What this article adds: Save the Children carried out a study to explore the effectiveness, appropriateness and sustainability of a kitchen gardens project implemented over four years in Pakistan. The study included a cost-benefit analysis. The return on investment for Save the Children was very low and unprofitable at \$1: \$0.32. With Save the Children support, the project yielded a positive return on investment for beneficiaries (\$1:\$1.69), but became unprofitable once external support was removed (\$1:\$0.53). Additional social benefits such as improved skills were not monetised, although this would have increased the potential value of the intervention. In conclusion, while there are short-term gains, a more cost-effective model and/or broader interventions are needed long-term.

Women and Children/Infant Improved Nutrition in Sindh (WINS) is a four-year project, funded by the European Union (EU), with the objective of improving the nutrition status of children, pregnant and lactating women (PLWs) in three districts of Sindh Province in Pakistan. The kitchen gardens intervention is one of the nutrition-sensitive activities of the project, intended to increase year-round access to nutritious foods, thereby bringing down the cost of a nutritious diet, increasing self-sufficiency and improving dietary diversity. A total of 10,000 predominantly female-headed households who have sufficient access to small areas of productive land were supported to establish healthy and low-input kitchen gardens. A study was carried out to explore the effectiveness, appropriateness and sustainability of the kitchen gardens. A cost-benefit analysis was also carried out to examine the return on investment by Save the Children for beneficiaries and for households to continue the intervention after the life of the project. The methodology, key findings and learning points are described in this report.

A mapping exercise with project staff identified major outcomes and data on benefits and outcomes were gathered from a sample of project beneficiaries (372 from 10,000 with 95% confidence level). Proxy indicators were used to monetise the outcomes identified, taking into account the wider context through use of information from existing Cost of Diet (CoD) and Household Economic Analysis (HEA) studies conducted in 2013. Project costs were analysed to identify attributable direct costs. Costs and benefits were then compared to identify basic returns on investment. It was not possible to monetise some important costs and benefits, such as human resources, improved skills and empowerment of women, which is a limitation of the study.

Costs

Specific costs considered included:

- Labour: Opportunity cost was calculated based on the market rate for daily unskilled

labour. This was estimated at 30 hours per month for each women on garden activities, which 'cost' Rs. 1,380 (\$13.02) per month.

- Training: This was estimated based on \$2.97 per diem for each of the four training sessions attended and \$43 trainer charge per session.
- Tools and inputs: This was calculated as \$2.63 per beneficiary per season for inputs and \$28.32 per beneficiary per season for a tool kit.
- Travel costs: Borne by beneficiaries to sell their produce in nearby markets (on average, Rs.40 (\$0.37) per visit, two visits per beneficiary).

Benefits

Benefits considered in this analysis included increase in household income from produce sale (average income was \$13.39 per month per beneficiary household), savings by beneficiaries because of the availability of vegetables (average \$9.56 per month per household) and improved nutrition and health status of households as a percentage savings in healthcare costs (the same percentage contribution of kitchen gardens to household income was applied to savings on healthcare as a rough approximation).

Women's empowerment was noted as a benefit, but it was not possible to monetise this. Furthermore, qualitative discussions revealed that women had not experienced significant empowerment; although primarily responsible for tending the kitchen gardens, they do not have control over the incomes they produce. Men controlled produce sale in 74% of households and only 27% of the women played an active role in deciding how the income would be utilised.

Positive changes in food security were revealed over the three-year period of the intervention (reduction in beneficiaries classified as poor from 89% to 19%). While the kitchen gardens may have contributed, other interventions in the WINS project and broader development and economic growth were also responsible.

Regarding sustainability, over two thirds (64%) of beneficiaries were currently still tending their kitchen gardens. However, productivity is comparatively lower compared to the first season of activity. The project successfully engaged the Agricultural Extension Department in training the beneficiaries in tending kitchen gardens, and follow-up visits by government officials were facilitated in terms of transportation and honorarium. However, given the meagre resources of government departments, little or no follow-up of beneficiaries by agriculture department officials is anticipated. However, the project has established linkages between the communities and the agriculture department which were non-existent before. Communities can access the department for any technical support post-exit.

Investment return

The return on investment for Save the Children was very low and unprofitable at \$1: \$0.32; the return is likely to decline in line with an expected fall in productivity. With Save the Children support, the project yielded a positive return on investment for beneficiaries (\$14 cost per month, \$23.6 return per month; \$1:\$1.69). Without external support, it is no longer profitable, costing \$44.80 per month with the same, or even declining, expected return (\$1:\$0.53 with current return). In fact, 36% of the beneficiaries have ceased kitchen garden activities within two years of their participation in the intervention, due to the perception that it is not sufficiently profitable to continue.

Conclusions

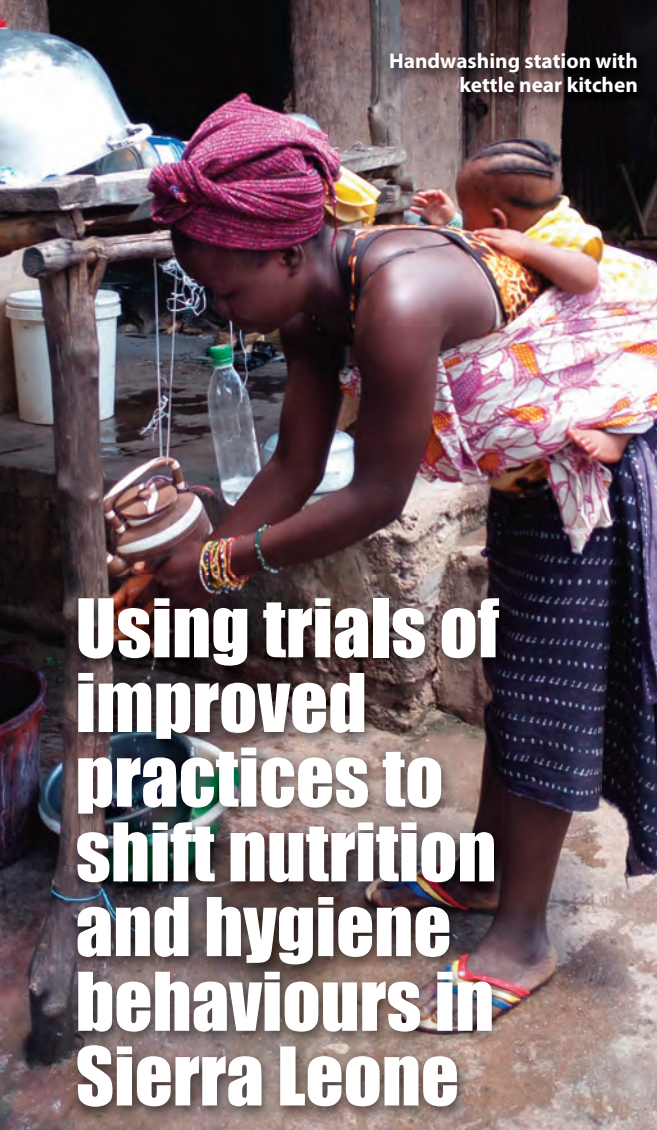
The authors conclude that kitchen gardens are only profitable with external support. While there are short-term gains, a more cost-effective model is needed long-term. It is worth noting a number of additional social benefits which were not monetised that may go some way to validate the intervention: kitchen gardens have improved beneficiary skills, income, nutritional quality of diets and household savings.

Lessons learned for Save the Children considering future kitchen-garden projects include: setting clear targets in relation to benefits; developing a cost-effective model for continuation post-agency intervention; and further development of the cost-benefit analysis tool on social returns on investment to foster critical reflection on programmes.

Additional approaches to ensure the greater empowerment of women are needed, such as linking women with markets and addressing some of the issues around intra-household control over resources. Activities that will ensure greater sustainability of the intervention include linking home producers/farmers groups to the relevant government departments and private sector actors from the outset. Applying modelling of yields and impact on household incomes and affordability at project design stage could help evaluate the potential long-term economic and social viability and sustainability of this type of intervention. Learning agendas should be developed at the outset to apply to the life of the project.

¹ Save the Children. Cost-benefit analysis of the kitchen garden intervention: Women and children/infants improved nutrition in Sindh, Pakistan Report, July 2016.

Handwashing station with kettle near kitchen



SPRING, Sierra Leone, 2016

Using trials of improved practices to shift nutrition and hygiene behaviours in Sierra Leone

By Jennifer Pietropaoli, Philip Moses and Heather Forrester



Jennifer Pietropaoli is the Outreach and Communications Officer for the SPRING Project. She provides communications support to the Sierra Leone team.



Philip Moses is an SBC Technical Advisor. He provides technical support to the SPRING team in Sierra Leone and provided training and guidance on the TIPs methodology.



Heather Forrester is a Senior Project Officer for SPRING Project. She supports SPRING's work in Sierra Leone.

The TIPs assessment was conducted by Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project, with the support of Helen Keller International (HKI).

SPRING/Sierra Leone would like to thank all those who contributed to this trial¹. Our sincere thanks to all household members in Madora, Kombra Junction and Kaimp Kakoloh villages for making themselves available during the trial period. The authors would like to thank Gwyneth Cotes for her support in developing and reviewing this article.

Location: Sierra Leone

What we know: Many nutrition and water, sanitation, and hygiene (WASH) interventions do not investigate the feasibility and acceptability of desired behaviour change with the intended beneficiaries.

What this article adds: SPRING/Sierra Leone conducted trials of improved practices (TIPs) with 24 households in Tonkolili District to test nutrition-sensitive WASH behaviours and selected complementary feeding behaviours for children aged 6-23 months. Intended beneficiaries were counselled on one or two household-specific, high-impact behaviours, with follow-up visits to identify barriers to and enablers of uptake. Creating handwashing stations and prioritising soap for handwashing were most tried and accepted (16/24 counselled). Prioritising consumption of colourful fruits and vegetables in complementary feeding were well received. Providing a child with a clean, enclosed play area to reduce exposure to animal faeces had low uptake (5/13 counselled); households preferred to sweep play areas and not restrict children's movement. Recommendations that required sharing resources between households were not well accepted. Findings from the TIPs informed the development of contextualised, behaviour-change communication materials that are being piloted in-country.

The USAID-funded Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) works in Sierra Leone to improve the uptake of behaviours related to nutrition, WASH and nutrition-sensitive agriculture. Based in Tonkolili District, SPRING's approach in Sierra Leone is to test and generate evidence on multi-sector approaches to social and behaviour change (SBC) through formative research and testing new SBC materials.

Many nutrition and WASH interventions rely on households changing their behaviours without much prior discussion with intended beneficiaries concerning why or how certain behaviours should be adopted or how they might affect specific members of the household. One way of improving uptake of behaviours is to consult with families on which behaviours are feasible and acceptable to them, then use the information to inform selection of behaviours to be promoted. The TIPs approach provides an opportunity to pre-test behaviours at the household level before they are widely promoted. By focusing on behaviour (what people do) rather than on knowledge (what people know or believe), TIPs engages families in dialogue and involves them as partners in designing the interventions that work best in their lives, providing an in-depth understanding of their preferences and capabilities, as well as the barriers and enablers they

may encounter when they try specific new behaviours.

SPRING/Sierra Leone conducted TIPs research with 24 households in three communities in two chiefdoms in Tonkolili District. Prior to conducting the TIPs, SPRING identified two commodities, fish and pumpkin¹, based on identified nutrient gaps among pregnant and lactating women and children aged 6-23 months (1,000 days households). Pumpkin and fish are widely consumed in Tonkolili District, but community-level discussions showed that pregnant women and young children often avoided these foods. To explore the feasibility of using traditional SBC approaches for nutrition-sensitive agriculture, SPRING conducted formative research using barrier analysis to identify determinants of fish and pumpkin consumption by pregnant and lactating women and children aged 6-23 months. Informed by these results, SPRING conducted the TIPs research to investigate caregivers' willingness to try new practices related to complementary feeding and safe water and sanitation for very young children (baby WASH). The objectives of the TIPs research were to:

1. Test mothers' responses to recommendations for improving infant and young child feeding, WASH

¹ Literature Review on Pumpkin in Sierra Leone. SPRING. www.spring-nutrition.org/publications/briefs/literature-review-pumpkin-sierra-leone



A father feeds his baby mango

research teams that they would continue all the practices they tried out.

SPRING's work in Sierra Leone is focused on testing approaches and disseminating lessons learned. Given that TIPs is formative research and not programme implementation, there are no plans to verify the long-term adoption of practices. As the six-year SPRING project will end in 2017, SPRING is working to pass information learned to the new Feed the Future (FTF) project in Sierra Leone, EAIN (Entrepreneurial Agriculture for Improved Nutrition), as well as other partners.

Conclusions and next steps

Although not statistically representative, the results of this small study indicate that it is an effective way to pre-test counselling for and promotion of new behaviours and to better understand the factors that may prevent or encourage households from adopting a new practice. The methodology engages people in dialogue and involves them as partners in designing the interventions that work best in their lives to achieve positive health outcomes for themselves, their families and their communities.

Furthermore, knowledge of household preference (for example, for sweeping rather than enclosed play spaces) is crucial information when designing a WASH-1,000 intervention. Because evidence suggests that clean play spaces, free from human and animal faeces, is a high-priority practice for improving infant and young child nutrition, SPRING will use this understanding to further contextualise this suggested behaviour and adapt it to make it more acceptable.

In order to create stronger, contextualised, behaviour-change materials for Sierra Leone, the team developed a behaviour-change framework (adapted from the Designing for Behaviour Change Framework³) for each recommended practice to guide analysis and the development of social and behaviour-change materials. A set of visual counselling cards, along with accompanying counselling messages, has also been developed and is being piloted among mothers' groups and during health education sessions at primary healthcare units in the district. SPRING plans to use the results from this research and other complementary research initiatives to inform the development of an SBC strategy to guide the nutrition and WASH-1,000 activities implemented by SPRING/Sierra Leone and collaborating local partners.

For more information, contact: Fiona Edwards, Programme Manager, SPRING/Sierra Leone, fedwards@spring-nutrition.org and visit: www.spring-nutrition.org/countries/sierra-leone

² Given the range of WASH behaviours, project timeline and budget, pumpkin consumption only was prioritised as a complementary feeding behaviour.

³ Food Security and Nutrition Network Social and Behavioral Change Task Force. 2013. Designing for Behavior Change: For Agriculture, Natural Resource Management, Health and Nutrition. Washington, DC: The Technical and Operational Performance Support (TOPS) Program. www.fsnnetwork.org/designing-behavior-change-agriculture-natural-resource-management-health-and-nutrition

and other desired practices; and determine which practices are most feasible and acceptable.

- Investigate the constraints mothers face when trying to change feeding patterns, hygiene practices and other daily routines; and determine their motivations for trying and sustaining new practices.

The first step in the TIPs methodology is to create and prioritise a menu of evidence-based behaviour options using existing data and local knowledge. The menu of key behaviour options was used over the course of three visits per household, during which enumerators:

- Interviewed and observed the household of the primary caregiver to understand household context and current behaviours;
- Informed by initial observations, counselled and negotiated one or two new high impact behaviours that the household was *willing* to try; and
- Carried out follow-up visits to understand what behaviours households were able or not able to carry out and to learn about the most important barriers to and enablers of those behaviours which the household opted to try.

The third visit also allowed enumerators to elicit suggestions from the participants about how to modify and promote behaviours. Dialogue and data from the visits were used to develop tailored, contextually appropriate messages for the promotion of these behaviours to the target audiences. Priority behaviours included:

- Feed pumpkin² to children aged 6-23 months at least two times per week;
- Construct a handwashing station (such as a tippy tap);
- Prioritise soap for handwashing and keeping soap by the handwashing station; and
- Ensure a clean play space for children under two (such as a cloth (lapa) or penned area).

Findings

Creating handwashing stations and prioritising soap for handwashing were among the interventions most tried and accepted by households in the study. The TIPs team suggested both practices to 13 households: 14 (one unprompted, having learned from neighbours,) exhibited high interest and willingness to create handwashing stations and 12 agreed to prioritise handwashing (some households were interested in both practices). During the follow-up visit, the number

of households that planned to create and maintain a handwashing station (16) actually exceeded the number of households that were counselled to try this practice (13), because three additional households decided to construct tippy taps after seeing their neighbours use one. Common reasons individuals gave for adopting this behaviour were that TIPs team members explained the behaviour and the simple construction process to participants in their home and that the materials (large water bottles and a nail) were readily available.

Prioritising consumption of colourful fruits and vegetables, such as mangoes, pumpkin, bananas and pineapple, as complementary foods were among the most acceptable behaviours to the households in the study. Participants felt it was relatively easy to teach young children to consume these foods, just as they had taught them to consume rice or porridge. Among the participants who were successful in adopting the practice, one major facilitating factor cited was the high availability of fruits such as mangoes (more available than pumpkin at the time of the study).

Not all the behaviours were equally likely to be suggested or adopted. Of the 24 households interviewed, 14 were counselled on creating a clean, enclosed play area for children to protect them from coming into contact with human and animal faeces, but only five were interested in trying this behaviour. At the follow-up visit, none of the participants who agreed to build a fenced-in play area had done so. Many participants explained that children were not used to their movement being restricted, expecting that the children would cry or that this would not be an appealing behaviour to them, despite initial interest. Many households preferred to continue sweeping the home environment periodically instead, explaining, "Seeing my child play with faeces and dirt, especially now that she crawls, motivated me to be sweeping regularly."

Including men, mothers-in-law and other members of the household in all three household visits seemed to facilitate the adoption of practices and encouraged full household participation in the various practices, especially the construction of the tippy tap. Recommendations that necessitated community or neighbourly sharing (e.g. splitting purchased soap and sharing the cost) were not widely appealing or commonly attempted. Overwhelmingly, participants told the

Cost analysis of the treatment of severe acute malnutrition in West Africa

Summary of research¹



A mother and child in a health centre in Diffa, Niger

Location: *Niger*

What we know: Perceived high cost of SAM treatment and limited evidence on true costs impede scale-up.

What this article adds: A recent study using Médecins Sans Frontières (MSF) nutrition programme data provides updated empirical estimates of SAM treatment costs. Overall cost per child treated was €148.86, substantially lower than previously published values. *Outpatient cost* was €75.50 per child, dominated by therapeutic food (44%) and personnel costs (35%). *Inpatient cost* was €134.57 per child, dominated by personnel (56%). As a high-cost input, investigation of cheaper, ready-to-use therapeutic food (RUTF) formulations and reduced dosage treatment remains a priority. Sensitivity analyses suggest total cost could decrease with less dependence on external personnel, integrated programmes in health systems, and increased programme scale; effectiveness of such approaches needs to be evaluated. A high proportion of cases (43%) were managed as more costly inpatients, emphasising the importance of early case detection to reduce overall costs.

This community-based approach to manage acute malnutrition is recognised as one of the 13 “high-impact” nutrition interventions for its potential to save lives (Bhutta et al, 2008) and is included in the package of key interventions promoted by the Scaling Up Nutrition movement. However, access to SAM treatment remains unacceptably low, with only 7–13% of children with SAM receiving treatment in 2012 (UNICEF et al, 2012). A fundamental obstacle to increasing programme coverage is the perceived high cost of treatment. This study was undertaken to generate updated estimates of SAM treatment costs. Data were collected from a Médecins Sans Frontières (MSF) nutrition programme in Niger and per-patient costs for SAM treatment were estimated, as well as expenditure shares for major cost categories. The authors also present sensitivity analyses to explore costs that may be realised with different input prices and two hypothetical delivery scenarios.

The analysis was based on MSF programme data from Madarounfa, Niger, where standalone SAM treatment is provided in parallel with basic paediatric care (not costed) within the routine health system. Services are delivered at or close to established basic health service facilities but with dedicated personnel, physical infrastructure and other resources. In 2013, the nutrition pro-

gramme included five health centres for outpatient treatment and one hospital for inpatient care.

Total and per-child costs were calculated from a provider perspective. Costs were categorised into three main activities (outpatient treatment, inpatient treatment and management/administration) and four cost categories within each activity (personnel, therapeutic food, medical supplies and infrastructure and logistical support). For each category, total costs were calculated by multiplying input quantities expended in the MSF programme during a 12-month study period by 2015 input prices. All children received outpatient treatment; 43% also received inpatient treatment. National-level support costs (such as guideline development and advocacy) were excluded. Also excluded were community screening and mobilisation costs for active case-finding and treatment of moderate acute malnutrition (MAM), and costs borne by households (transportation, food purchases and productivity losses related to treatment).

Results

The overall cost of SAM treatment was €148.86 per child treated. The outpatient cost was €75.50 per child. Two costs predominated here: therapeutic food (44%, €32.98 per child) and personnel (35%, €26.70 per child). Personnel costs were dominated by medical staff, where expatriate

and national medical staff contributed €10.01 (13%) and €12.63 (17%) per child respectively. Approximately €1 per child (1%) of outpatient care was attributed to routine treatment, while the cost per child was €7.14 for non-routine medical treatment and supplies and €7.66 for infrastructure and logistical support (each approximately 10% of outpatient costs). Heterogeneity in outpatient costs was observed between sites, with total outpatient cost per child ranging from €49.71 for a site with 8,321 admissions per year to €140.56 for a site with 996 admissions per year.

A simple logarithmic cost curve relating outpatient volume to outpatient costs implied substantial economies of scale, with total costs increasing by 5.3% (and average costs declining by 4.3%) for every 10% increase in client volume, largely due to lower per-child personnel costs in high-volume sites. The inpatient cost was €134.57 per child. Personnel accounted for the largest portion of inpatient costs (56%, €75.47 per child), followed by transport and logistical support (18%, €23.57 per child) and non-routine medical treatment and supplies (16%, €21.19). Therapeutic food contributed 11% of inpatient costs (€14.34 per child). Management and administration costs per child were €40.38, with 76% (€30.63 per child) attributed to personnel and infrastructure and 23% (€9.18 per child) to logistical support.

Sensitivity analyses suggested that reductions in input prices of medical treatments and therapeutic food had limited effect on total costs per child, while increases in programme size/coverage and the substitution of expatriate medical

¹ Isanaka S, Menzies NA, Sayyad J, Ayoola M, Grais RF and Doyon S. (2016). *Cost analysis of the treatment of severe acute malnutrition in West Africa*. *Matern Child Nutr*, doi: 10.1111/mcn.12398

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staff with national staff lowered total costs per child substantially (€99.60 and €96.31 respectively vs. €148.86 in the base case). Hypothetical scenarios representing typical vertical and integrated government-supported SAM treatment programmes yielded further important cost reductions (€74.23 and €42.49 respectively vs. €148.86 in the base case).

Discussion

The most important cost driver in outpatient care was ready-to-use therapeutic food (RUTF). As a high-cost input, development of cheaper formulations through local production and/or use of indigenous food sources have been considered. The cost of locally produced RUTF would be context and even producer-specific, as final costs depend on the cost of ingredients, production volume, supplier agreements, demand and packaging. Potential benefits of local production include: readily accessible stock in case of emergency; lower transport costs; and local economic benefits. However, recent experiences show local production ingredient costs can remain high, given import and local taxes, and potential cost savings may be limited by lower production volumes. Ongoing operational re-

search is needed to understand the cost-effectiveness of a reduced RUTF dose in outpatient SAM treatment.

Sensitivity analyses suggest that the total cost of SAM treatment could decrease with less dependence on costly external personnel and increased programme scale. As outpatient services are provided by clinical teams of fixed size, once a clinical team is in place, admissions can increase until teams reach capacity, with little additional expense beyond the extra costs of RUTF and medical supplies. Thus, higher-volume service outlets will likely experience lower average costs per child. Development of national capacity, including training of nurses and community health workers, may reduce programme costs associated with external support. Strategies that increase scale and patient volume (for example by reducing the frequency of visits of the same child from weekly to biweekly or monthly follow-up or by increasing coverage through enhanced community case-finding) may also reduce per-child and total costs.

In this setting, 43% of children required more costly inpatient care, suggesting a high burden of

complicated cases. Models that support early identification of children before complications develop (for example through integrated SAM/MAM treatment or improved community case-finding) may also reduce overall programme costs.

The analyses of hypothetical scenarios suggest that SAM treatment costs could decrease substantially with less dependence on costly external expertise and with integration of SAM treatment into existing health services. The effectiveness of such models, however, has not been evaluated and additional costs for increased supervision and support may be necessary to maintain adequate levels of effectiveness in government-supported programmes. Cost-effectiveness of such experiences should continue to be assessed.

In conclusion, the authors present updated empirical estimates of SAM treatment costs that are substantially lower than published values. Sensitivity analyses suggest costs can be driven down further in programmes operating at scale and when integrated into existing health systems. Additional evidence on SAM treatment costs would be valuable, considering possible avenues of further cost reduction and variability in costs across contexts and delivery models.

Local versus offshore costs of RUTF and LNS

Summary of research¹



Location: *Global*

What we know: UNICEF is the largest purchaser of ready-to-use therapeutic food (RUTF) and supports local production, and has aimed to reach 50% sourcing from countries with acute malnutrition treatment programmes by 2016.

What this article adds: A recent study explored key benefits and challenges to local versus offshore manufacture of RUTF, through analyses of UNICEF procurement and the Nutriset Plumpyfield producer network. Prices and estimated costs of locally produced product have consistently been higher than offshore prices. Local manufacture faces challenges in taxation on imported ingredients, low factory utilisation, high interest rates, long cash conversion cycle and less convenient access to quality-testing labs. In a tax-free environment, local production is closer to cost parity for RUTF. Expansion of RUTF producers into the production of other ready-to-use foods (RUF) may close cost and price gaps further. Local RUF production is encouraged by a favourable tax environment, assistance in lending, consistent forecasts from buyers, investment in reliable input-supply chains and local laboratory testing.

Ready-to-use-foods (RUF) include ready-to-use therapeutic foods (RUTF) and ready-to-use supplementary foods (RUSF), which largely refers to a range of lipid-based nutrient supplements (LNS) used

in large, medium or small quantities (LQ-LNS, MQ-LNS and SQ-LNS respectively). Nutriset produces about half the global supply of RUTF (Plumpy'Nut®). Its patented formulation is shared with other manufacturers via its PlumpyField

Network, which now comprises seven partners in low-income countries, and a US-based, non-profit organisation. UNICEF is the largest purchaser of RUTF and supports local production, and aimed to reach 50% sourcing from countries with acute malnutrition treatment programmes by 2016. Perceived advantages for local production include: long-term cost reduction; increased availability; economic benefits to farmers and manufacturers; and ability to customise to suit locally available ingredients, taste preferences and distribution channels.

Objectives and method

This study explored the economic benefits and challenges of local RUF production through analysis of RUTF procurement and production, specifically the ~80% of the RUTF market procured by UNICEF, and the ~70% of global market produced by Nutriset and the PlumpyField

¹ Segrè J, Liu G and Komrska J. (2016) *Local versus offshore production of ready-to-use therapeutic foods and small quantity lipid-based nutrient supplements*. *Matern Child Nutr*, doi: 10.1111/mcn.12376.

network. It involved analysis of UNICEF Supply Division data, published and grey literature review, and site visits and interviews with local and offshore manufacturers.

Results

As of July 2015, UNICEF reported an RUTF supplier base of 15 manufacturers. Nine were local producers in programme countries, of which seven had local prices, two provided products both locally and for export, and two exclusively exported. The average price from offshore producers was USD\$47.48 per 13.8kg carton (\$42.06-\$61.41/carton) versus the average local-for-local price of USD\$53.21 (\$46.77-\$59.25); all prices are exclusive of international transport. The price gap has been narrowing since 2003.

Analysis of taxation found that UNICEF imports RUTF into high-need countries free of both import duties and value-added tax (VAT), but local producers in some countries must pay import duties for specific inputs they cannot source locally and VAT on all inputs, regardless of origin. An estimate of 2012 tax rates on standard inputs in six countries with local RUTF production showed that tax rates constitute 6-35% of total input cost. This made offshore RUTFs less expensive in some cases, after shipping, than local production.

Tax-free environments are relatively rare and the authors illustrate a cost-comparison of RUTF manufactured in Ethiopia by Hilina Enriched Foods against RUTF produced offshore by Nutriset, with and without cost of freight. Both the offshore product and imported ingredients for the local producer were exempt from import duties, making local production near parity with offshore production plus sea freight.

Across 20 suppliers in 2014, offshore manufacturers had three times the total production capacity of local manufacturers (75% of total production). In the first half of 2015, UNICEF purchased 14,714 metric tons (MT) of RUTF, with 74% from offshore manufacturers. Cost of debt was a challenge raised in interviews by local producers, with working capital in short supply and interest rates variable on borrowing capital needed to operate. Credit is more readily available to European and US producers, and banks in low-income countries typically charge higher interest rates. Local producers are more likely to have to pay for inputs in advance, wait longer for imported inputs, and must use offshore laboratory analysis and quality control facilities. An analysis of cash-conversion cycles showed a two-month difference in production time. In the most extreme case, the estimated cost of debt¹ for a manufacturer in Madagascar (\$30,000 per 100,000 USD of principal) is two orders of magnitude larger than the cost of debt for a manufacturer in the United States (\$275 per 100,000 USD of principal).

UNICEF's aim to reach 50% local production by 2016 was closest in 2012 with a high of 45% from manufacturers based in Africa. However, this share fell to 31% in 2014 and was at 28% in mid-2015. As far as local economic benefit, a

total of 91 full-time jobs had been created in three local producers for which UNICEF had employment data. PlumpyField estimates the creation of new jobs through its network to be 500 since 2005, not including indirect employment in laboratories, agricultural supply chains and related industries.

Discussion

Challenges for local producers

Results from pricing data show that locally produced RUTF has been more expensive than offshore production to date. Price disparity, excluding shipping costs, decreased to less than 5% in 2015, but local production does not yet meet local global demand. The authors identified taxation, low factory utilisation, cost of debt and quality assurance as key challenges.

Local producers are subject to taxable, imported inputs due to lack of local availability (e.g. special milk powder) or quality standards (e.g. aflatoxin-free peanuts). Tax exemptions from both import duties and VAT would encourage cost competitiveness. Low factory utilisation may also contribute to production cost (high utilisation means lower fixed costs per unit), but spikes in demand for RUTF due to response to emergencies or variations in donor funding make this challenging for RUTF producers. Moreover, introducing large new producers may risk increasing the price for RUTF because the market is still relatively small. High-volume offshore producers are better able to aggregate demand spikes across multiple products, whereas capacity utilisation among both offshore and local suppliers to UNICEF remains low.

Other barriers for local producers are working-capital constraints, since most cannot afford to have capital tied up in product sitting in warehouses. Quality assurance poses specific challenges in local production environments. The detection of microbial contaminants in RUTF samples led to increased testing and production shortages among local manufacturers, resulting in a decrease in procurement from UNICEF programme countries in 2012-2013.

Rising costs of laboratory analysis for both inputs and finished products particularly affect local manufacturers, since samples are usually sent overseas due to a lack of certified local laboratories. One exception is Ethiopian local manufacturer, Hilina Enriched Foods, which has set up a new laboratory for local analysis that is expected to benefit RUF manufacturers across East Africa. Strict aflatoxin limits often require local RUF producers to import peanuts even when there is a domestic peanut supply. Some local producers have invested in upgrading local agricultural practices to improve their supply chain, incurring immediate costs but with potential long-term benefits.

Other potential benefits of local production

While local manufacturing creates local employment, there is little data on such indirect economic benefits to communities. As yet, products are

largely not customised to local inputs, tastes and distribution channels, although there is active research and development (R&D) on new formulations with locally available or preferred ingredients that meet the same nutritional requirements. Examples include lipid-based products using lower cost, locally available inputs like chickpeas, and Vietnam's programme using a locally developed RUTF formulation based on bean paste. Local production may help national governments integrate programmes addressing malnutrition, with local ownership potentially improving coordination in manufacturing, agricultural supply chains and health systems.

Small quantity, lipid-based nutrient supplements (SQ-LNS)

The authors suggest that expanding production of RUTF to RUSF could help local producers achieve sustainable scale, since all RUF require similar raw materials and safety standards, requiring limited further investment. SQ-LNS is composed of the same ingredients as RUTF has a larger potential market (as a preventive product) and, although it is likely subject to taxation (as a non-emergency product), would have a more predictable demand. Spikes in RUTF need could be met by adjusting volumes of SQ-LNS. Only 25-50% of the economic value of the inputs for today's RUTF or SQ-LNS formulations is likely to be sourced in-country. Producing more SQ-LNS would likely require additional employment. Local and offshore producers for SQ-LNS may benefit from private sector partnerships with local food producers and distributors.

Conclusions

The study concludes that despite the challenges of local production, RUF should be produced by local manufacturers. In some countries, the opportunity to procure from local manufacturers can be instrumental in getting national governments to consider allocation of funding for RUTF purchase. The PlumpyField network is accelerating the transition from offshore to local production, including pooling procurement across producers to benefit from volume discounts, standardising production equipment, providing technical and quality assurance assistance, and supporting local product pilots. A number of actions are suggested to help accelerate the shift to local production of RUF:

- Governments could waive duties and VAT on inputs for RUTF;
- High-volume buyers of RUTF and SQ-LNS could consider measures to shorten cash-conversion cycles for local manufacturers;
- Buyers could make greater efforts to forecast their order volumes, enabling better matching of production capacity with order size; and
- Investment in local quality-testing facilities would reduce the length of cash-conversion cycles and testing costs.

¹ Total cost of debt was estimated using World Bank 2014 lending rates and loan duration of six months for local and one month for offshore manufacturers.

Efficacy of three feeding regimens for home-based management of children with uncomplicated severe acute malnutrition

Summary of research¹



Measuring weight as part of the study

Location: *India*

What we know: In India an estimated eight million children under five years old are severely malnourished. Acceptance of ready-to-use therapeutic food (RUTF) for SAM treatment is limited by lack of context-specific evidence.

What this article adds: A randomised trial to compare the efficacy of centrally produced RUTF (RUTF-C) and locally prepared RUTF (RUTF-L) for home-based management of children with uncomplicated SAM compared with a micronutrient-enriched, energy-dense home-prepared foods (A-HPF) was conducted (2012-15) in three diverse settings in India. Primary outcome was recovery by 16 weeks after enrolment, with follow-up for 16 weeks post treatment. The intervention included free RUTF/food provision, weekly house visits to log intake and daily peer support. Recovery rates with RUTF-L, RUTF-C and A-HPF were 56.9%, 47.5% and 42.8%, respectively (all below Sphere standard). Time to recovery was shorter in both RUTF groups. Peer support improved recovery rates. Relapse rate was high. Home-based management of children with uncomplicated SAM is effective and feasible. RUTF-L results in higher recovery rates than home food options. Additional nutritional support post-discharge is critical to sustain recovery.

An estimated 0.5 to 2.0 million global deaths are attributed to Severe Acute Malnutrition (SAM) each year (Olofin et al, 2013). Of the 20 million children with SAM worldwide, over eight million are from India, where around 5% of children under five years old suffer from SAM (Ahmed, 2014; MOWCD, 2015; WHO, 2014). The World Health Organisation (WHO) recommends ready-to-use therapeutic food (RUTF) for home-based management of uncomplicated SAM (WHO, 2007). However, acceptance of this recommendation has been limited in India. This is in part due to a lack of evidence from controlled trials of the efficacy of RUTF compared with other treatment options, as well as the use of 'standardised' diets in existing studies. Experts argue that the comparison group should be given locally produced foods high in energy and proteins with adequate micronutrients. In addition, there are questions in India about the use of commercially produced RUTF over locally produced products or augmented home foods, given that locally produced RUTF using indigenous foods may be less expensive and more sustainable if its efficacy could be proved.

Well designed, adequately powered, pragmatic randomised trials have been recommended to compare treatment options for home-based

management of uncomplicated SAM (Kapil, 2009; Schoonees et al, 2013). In response, the authors of this study conducted a randomised trial to compare the efficacy of centrally produced RUTF (RUTF-C) and locally prepared RUTF (RUTF-L) for home-based management of children with uncomplicated SAM, compared with micronutrient-enriched, energy-dense, home-prepared foods (A-HPF).

Method

The study was conducted among low-income households in three diverse geographical settings in India; Rajasthan, Tamil Nadu and Delhi. Screening using mid-upper-arm circumference (MUAC) was conducted at household level. Children aged 6-59 months with MUAC < 130mm were referred to clinic for weight-for-height z score (WHZ) assessment. Children with WHZ < -3 SD or oedema of feet or both were identified as SAM.

Children aged 6 to 59 months with uncomplicated SAM and parental consent were enrolled in the study. Enrolment began in October 2012; follow-up was completed in April 2015. Children were randomised into one of the three groups: RUTF-C, RUTF-L and A-HPF. The primary outcome was recovery by 16 weeks after enrolment (defined as WHZ ≥ -2 SD of the WHO

standards and absence of oedema of feet). Secondary outcomes included weight gain, time to recovery, prevalence of diarrhoea, acute lower respiratory tract infection (ALRI) and fever, mortality and hospitalisations during the treatment phase (until recovery or 16 weeks after enrolment, whichever was earlier). Another secondary outcome was the proportion of children with WHZ ≥ -2 SD at the end of the sustenance phase (16 weeks after completion of the treatment phase). Co-interventions (medical treatment) was the same across all three groups.

Foods were delivered free of cost in the three study groups, with the aim of ensuring an intake of at least 175 kcal/kg body weight/day. The composition of RUTF-C, packaged in 92g sachets (Compact India, Gurgaon, India), conformed to WHO recommendations. Each site team was trained in the preparation of RUTF-L and the preparation was carried out under stringent conditions, with microbiological testing every three months. Families of children in the comparison group (A-HPF) were given raw ingre-

¹ Bhandari N, Mohan SB, Bose A, et al. Efficacy of three feeding regimens for home-based management of children with uncomplicated severe acute malnutrition: a randomised trial in India. *BMJ Global Health* 2016;1:e000144. doi:10.1136/bmjgh-2016-000144



Local production of RUTF used in the study

Centre for Health Research and Development, Society for Applied Studies, New Delhi.

dients to prepare foods at home, including locally available and acceptable cereals and pulses, sugar, oil, milk and eggs. Recipes for making energy-rich and nutrient-rich foods for children were promoted and a micronutrient preparation was given to caregivers to add to the cooked meal prior to feeding. In the A-HPF group, food ingredients were given in excess of requirements for the child, given the expectation of some sharing within the family.

Weekly household visits were carried out by a study worker (government Accredited Social Health Activist) during the treatment phase to counsel, resolve caregivers' queries and difficulties, replenish supplies and collect empty RUTF-L jars and wrappers of RUTF-C packets to calculate consumption. Information on intake of RUTF-L and RUTF-C was recorded and the amounts of ingredients used weekly were documented for the A-HPF group. Consumption data for the comparison group was not collected, given the greater difficulty in capturing valid information. Site-specific counselling cards made in the local language were used. Neighbourhood peer support workers visited homes several times a day to help caregivers feed their children in all three groups. Data from all sites were pooled and analysed using Stata software (V.12.0).

After completion of the treatment phase, the study team facilitated linkages between the families and the government-run anganwadi centres, where supplementary food is provided under the Integrated Child Development Services (ICDS) scheme. This was carried out over the next 16 weeks (sustenance phase).

Results

Results show that recovery rates with RUTF-L, RUTF-C and A-HPF were 56.9%, 47.5% and 42.8%, respectively. The adjusted OR was 1.71 (95% CI 1.20 to 2.43; $p=0.003$) for RUTF-L and 1.28 (95% CI 0.90 to 1.82; $p=0.164$) for RUTF-C compared with A-HPF. Weight gain in the RUTF-L group was higher than in the A-HPF group (adjusted difference 0.90 g/kg/day, 95% CI 0.30 to 1.50; $p=0.003$). Time to recovery was shorter

in both RUTF groups. In-depth interviews with caregivers revealed little evidence of food sharing. Morbidity was high and similar across groups.

The proportion of children with WHZ >-2 was similar (adjusted OR 1.12, 95% CI 0.74 to 1.95; $p=0.464$) in the RUTF-L and A-HPF groups. However, the proportion was higher for moderate malnutrition (WHZ <-2 and ≥-3) (adjusted OR 1.46, 95% CI 1.02 to 2.08; $p=0.039$), and lower for those with SAM (adjusted OR 0.58, 95% CI 0.40 to 0.85; $p=0.005$) in the RUTF-L group, compared to the A-HPF group. The overall recovery rates in children whose families were offered peer support were substantially higher than in those who did not receive this support (55% vs 42%, $p<0.001$).

During the sustenance phase, 838 children (92.5%) were available for follow-up. Of these, 123 (14.7%) met the definition of recovery; 402 (48.0%) met the definition of moderate acute malnutrition (WHZ <-2 and ≥-3); and 313 children (37.4%) had SAM.

Discussion

The authors discuss the fact that recovery rates are lower in this study than those observed in Africa, despite a longer duration of treatment and support to families for feeding. One reason for this may be that all children in the study had marasmus, whereas in similar studies in Africa the majority of children had kwashiorkor, and it is these children who had higher recovery rates (Oakley et al, 2010; Linneman et al, 2007). Evidence suggests that children with kwashiorkor tend to have higher weight-for-age than those with marasmus and may need to gain less weight to recover once they no longer have oedema. An additional explanation is that African studies used height at enrolment to calculate WHZ during follow-up. In this study, subsequent height was used, measured concurrently with weight every week during follow-up. Using height at enrolment increases the proportion of children who reach the cut-off for recovery.

The authors consider the most valuable lesson of the study implementation is the need for

extra support for feeding to ensure weight gain and recovery. Help from local, experienced women seemed to improve food intake. Also important is the finding that many children remain or slide back into moderate or severe malnutrition as early as within 16 weeks after the end of treatment. While linkages between families and the government anganwadi centres were established, the findings suggest additional measures may be needed to sustain recovery. These may include close monitoring, improved counselling, support to caregivers, provision of additional food supplements (including prolonged use of RUTF) and prompt treatment of illness.

The authors conclude that home-based management of children with uncomplicated SAM is an effective and feasible option and that use of an RUTF-L results in higher recovery rates than feeding nutrient-dense and calorie-dense home foods. The gains observed in the initial 16 weeks, however, decline after treatment. Other approaches need to be considered to improve long-term outcomes, including prolonged use of RUTF-L.



Measuring subscapular skinfold thickness during the study

Centre for Health Research and Development, Society for Applied Studies, New Delhi.

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Predicting coexistence of wasting and stunting in Guinea-Bissau: a secondary data analysis

Summary of MSc thesis¹

By Abbi Sage

Abbi Sage is a recent MSc graduate in Nutrition for Global Health from the London School of Hygiene and Tropical Medicine. She is now part of the Knowledge Management Team of the Nutrition Division of the World Food Programme.

The author acknowledges her supervisor, Suneetha Kadiyala, and co-supervisor, Helen Harris-Fry, for their joint support.

WFP/Dani-Vieira da Costa



Mores Health Center in the Oio region, Guinea-Bissau

Location: *Guinea-Bissau*

What we know: A child who is both wasted and stunted has higher associated morbidity and mortality.

What this article adds: This secondary analysis of 2014 MICS data identified socioeconomic and health factors that are associated with concurrent wasting and stunting in children aged 6-59 months in Guinea-Bissau. Six per cent of 6,602 children analysed were wasted (1% severely wasted); 30% were stunted (9% severe); 2.4% of children were both wasted and stunted. Of those stunted, 8.2% were wasted; of those wasted, 40.7% were stunted. Most children (86.2%) did not meet minimum dietary diversity. The largest maternal age group was adolescents (15-19 years) (23%). Concurrent wasting and stunting was more prevalent in boys than girls by 24%. Both observed mosquito net in the house and lack of diarrhoea in the last two weeks were protective of concurrent wasting and stunting. More surprisingly, richer children were 2.27 times more likely to be wasted than the poorest children. The findings reiterate the importance of considering concurrent wasting and stunting in undernourished children for policy and programming.

Background

Wasting and stunting are commonly considered as separate undernutrition conditions in programming and policy worldwide. Recent evidence points to the correlative nature of the two conditions and suggests that a child who is moderately wasted and stunted at the same time is at far higher risk of mortality compared to a severely wasted or stunted child (Khara T, Dolan C, 2014).

With an estimated population of 1.8 million, Guinea-Bissau has a high infant mortality rate at 77.9 per 1,000 births. In 2015, the under-5 mortality rate was even higher at 124 per 1,000 live births (12.4%). Political instability means 70% of the population live in poverty. Food insecurity, seasonal changes in rainfall, poor infant and young child feeding (IYCF) practices, poor water and sanitation, and inadequate health services result in undernutrition being a major public health concern; prevalence of chronic undernutrition is above 25%.

The overall aim of this study was to identify socioeconomic and health factors that are associated with the coexistence of wasting and stunting in children between the age of 6-59 months in

Guinea-Bissau. Specific objectives were:

- To characterise patterns of stunting and wasting, with specific focus on the coexistence of stunting and wasting;
- To identify associations between hypothesised socioeconomic and demographic determinants of wasting and stunting separately, and the coexistence of wasting and stunting.

Study methods

Data from a UNICEF Multiple Indicator Cluster Survey (MICS) published in 2014 were used for this secondary data analysis. Only participants in the MICS that met the eligibility criteria outlined below were included in the analysis. A total of 6,602 children living in 4,016 households and 5,303 mothers were included in the final analysis.

Inclusion criteria:

- Children 6-59 months of age with data on both weight-for-height z score (WHZ) and height-for-age (HAZ) and the mothers/caregivers of those infants.

Exclusion criteria:

- Women aged 15-49 years in original survey

- who did not have children 0-5 years of age;
- Households without children under five years of age;
- Anthropometry outliers using the World Health Organisation (WHO) cut-off criteria of >5.00 & <-6.00 z-scores;
- Infants 0-6 months of age (due to programmatic and biological differences in dealing with wasting or stunting in infants aged 0-6 months compared to children aged 6-59 months).

Using the UNICEF conceptual framework of undernutrition, indicators from the original survey were used as proxy measures for more commonly used indicators, based on prior literature. In this study, the immediate predictors were considered at the individual level of the child, while the underlying and basic predictors are at the maternal and household level (see Figure 1).

Univariate, multinomial logistic regression was initially used to investigate crude relationships between covariates and wasting; stunting; and wasting and stunting combined, compared to not wasted or not stunted children. Variables in the univariate analysis with a small sample size due to missing values were not included in the multivariable regression. The multivariable regression results were deemed statistically significant if covariates produced a p-value of ≤ 0.05 . All analyses accounted for the clustered sample design.

Findings

Child determinants

Of 6,602 children, 3,257 were girls (49.3%). The mean age of all children was 32 months (95% CI 31.4, 32.3); 63.3% (4,862) of the children were from a rural setting.

¹ Sage, A. (2016). Secondary Data Analysis on the Coexistence of Wasting and Stunting in Children Under-5 in Guinea-Bissau using MICS 2014 data. MSc Nutrition for Global Health thesis, London School of Hygiene and Tropical Medicine

For children aged 6-23 months, 86.2% did not meet minimum dietary diversity, with the median being two food groups (IQR 1.5, 2.5). Of note, 43.1% of information on child dietary diversity was missing. A total of 12.6% of children had diarrhoea in the previous two weeks; children aged 6-11 months had the highest prevalence of diarrhoea at 25.4%.

Maternal determinants

The median age of mother/caregivers was 27 years (IQR 26.5, 27.5); the largest group of mothers were adolescents themselves (23%), aged 15-19 years old. Approximately 60% of mothers had no formal education. Most (92.2%) of women claimed to have had antenatal care during pregnancy, however 67.7% of the data were missing.

Household determinants

Most (97%) households had an observed mosquito net. Once disaggregated by anthropometric deficit, almost 10% of wasted and stunted children did not have a mosquito net in their house, followed by 5% of wasted children compared to 3% of not stunted or wasted children and 2% of stunted children. Roughly half of households were Muslim and approximately one third of mothers had undergone genital mutilation. The poorest wealth index had the highest percentage of female genital mutilation (29%).

Wasting

Six per cent of children were wasted, of whom 1% were severely wasted. Among all the predictors tested in the multivariate model, a child whose mother had undergone FGM had a reduced risk of wasting by 31% (p-value 0.05). Taking a closer

look at this result, the confidence interval crosses one (0.47, 1.01), reducing the certainty of the significance which could be a result of the arbitrary p-value cut-off.

Surprisingly, there were more wasted children who were wealthy compared to the poorest in the sample population being studied. Children with a richer wealth index were 2.27 times more likely to be wasted than children with the poorest wealth index (p-value 0.006). One explanation for this association may be that more children were wasted in urban areas than rural areas (4.2% and 3.2% respectively). It may not be the case that a higher wealth index predicts wasting but that, in this population, children were more likely to be wasted due to the higher percentage of wasted children living in urban areas, where wealth index scores were generally higher. The urban capital, Sector Autónomo de Bissau (SAB), had the highest percentage of wasting compared to all other regions. Future research is needed into the current state of children in urban settings in Guinea-Bissau, particularly SAB, to understand the factors at play with this association.

Stunting

Approximately 30% of children were stunted, with severe stunting at 9%. In the multivariate model all age groups had a strongly significant higher risk of being stunted compared to 6-11 month old children (p-value <0.001). There was weak evidence that children who had an educated mother at secondary level were almost 30% less at risk of being stunted than those who had an uneducated mother (p-value 0.045). Children from the richer and richest wealth

index were 46% and 63% respectively less at risk of being stunted than children from the poorest wealth index (p-values <0.001).

Wasting and stunting

Only 2.4% of children aged 6-59 months were both wasted and stunted at the time of the survey; however, of those stunted, 8.2% were wasted and of those who were wasted, 40.7% were stunted. No wasting, no stunting, and wasting and stunting individually were distributed equally across girls and boys. However, boys were 24% more concurrently wasted and stunted than girls.

In the multivariate analysis, children who had diarrhoea in the last two weeks were 75% more at risk of being both wasted and stunted than those who did not, relative to children who were neither wasted or stunted (p-value 0.022). There was strong evidence that having a mosquito net in the household decreased a child's risk of being both wasted and stunted by 78% compared to not having a mosquito net (p-value 0.003).

Due to the small sample size of the psychosocial stimulation predictor, a separate multivariate regression adjusting for sex, child age, mother age and wealth index was created. There was weak evidence for a protective association between psychosocial stimulation and wasting and stunting (N=2,744). For every additional person to engage in cognitively engaging activities with the child, the child had a 15% lower risk of being concurrently wasted and stunted, relative to a not stunted or wasted child (p-value 0.043).

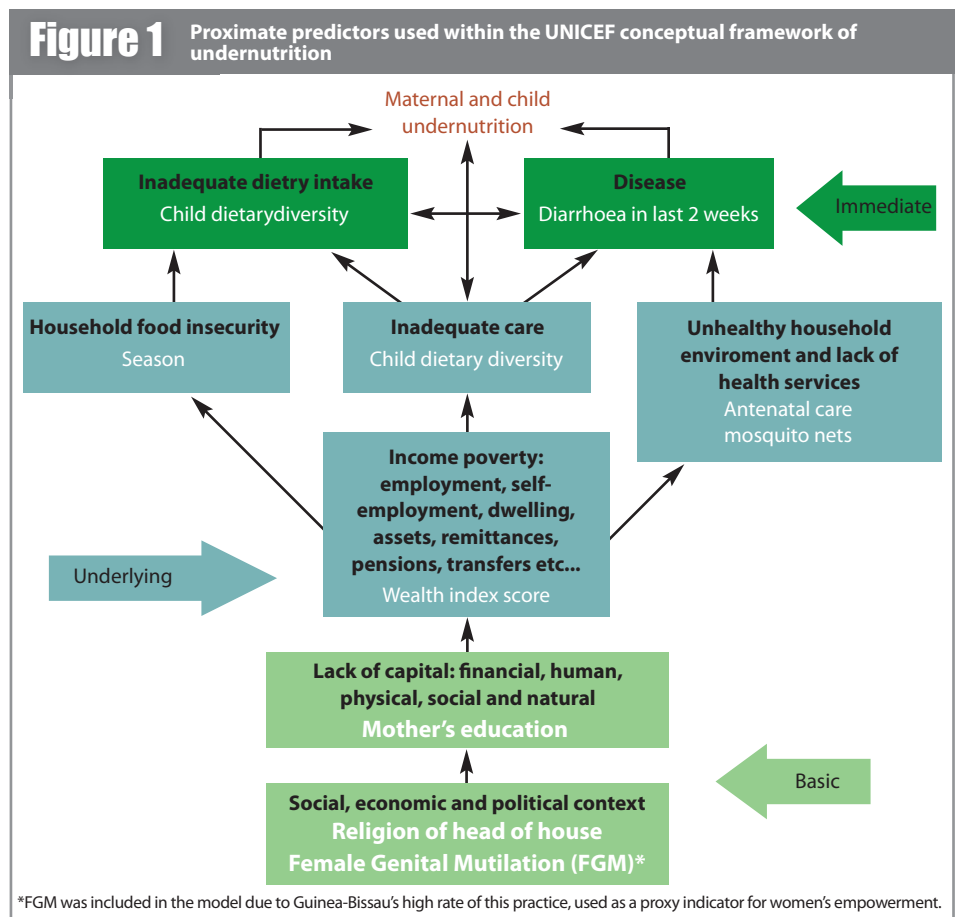
Discussion

This study has highlighted that associations that are insignificant for wasting and stunting individually become significant once wasting and stunting coexists in a child in Guinea-Bissau. In particular, observed mosquito net in the house and lack of diarrhoea in the last two weeks were both protective of concurrent wasting and stunting.

Approximately 30% of children were stunted (WHO high public health concern), while 6% were wasted (WHO medium public health concern). Due to the cross-sectional nature of the data, the prevalence of wasting seen here may not reflect the true prevalence of wasting in under-fives. Another limitation of this analysis is missing data, limiting the ability to test predictors such as dietary diversity and antenatal care.

The findings reiterate the importance of considering concurrent wasting and stunting when considering programming and policy to address undernutrition in Guinea-Bissau.

For more information, contact: Abbi Sage, abbisage12@gmail.com



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Mortality and causes of mortality in children 6-59 months of age admitted to inpatient therapeutic feeding centres in Niger

By Florence Tapié de Céleyran, Kerstin Hanson, Cecilia Ferreyra, Nuria Salse, Didier Tshialala, Cristian Casademont, Rebecca Grais and Helena Huerga Food Policy Research Institute

Florence Tapié de Céleyran is a Clinical Epidemiologist with Epicentre, Paris

Kerstin Hanson is Paediatric/Nutrition Adviser with Médecins Sans Frontières (MSF), France

Cecilia Ferreyra is HIV/TB Adviser with MSF Spain

Nuria Salse is Nutrition Adviser with MSF Spain

Didier Tshialala is a Medical Doctor with MSF Spain

Cristian Casademont is Head of the Operational Medical Unit, MSF Spain

Rebecca Grais is Director of Research at Epicentre, Paris

Helena Huerga is a Clinical Epidemiologist with Epicentre, Paris

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Location: *Niger*

What we know: Children with severe acute malnutrition with medical complications are at heightened risk of death.

What this article adds: Médecins Sans Frontières (MSF) examined mortality, causes of mortality and co-morbidities among children aged 6-59 months admitted to an inpatient therapeutic feeding centre (ITFC) in three MSF-supported sites in Niger, for all cases and for poor responders to treatment. A total of 2,765 children were included in the study. The principle cause of morbidity in all three sites was malaria (30-61.3%). The leading causes of mortality were sepsis, malaria and respiratory infection. Higher proportional mortality due to malaria in one site was likely seasonal. Poor response to ITFC therapy varied between sites (4.6-23.6%). Leading causes of mortality (ranging from 4.3 to 8.8%) among poor responders were: malaria, diarrhoea, sepsis, respiratory infection (including TB) and HIV. HIV prevalence in one site was 5.4% on selective screening and 0.5% on post-study systematic screening. Respiratory infection was an important cause of mortality in all sites; case detection and case fatality for TB was likely under-diagnosed.

Background

Malnutrition is responsible for nearly half (45%) of all deaths in children under five years old (Black et al, 2013). Current guidelines recommend that children with severe acute malnutrition (SAM) and medical complications or poor anthropometric or clinical improvement after two or three weeks of nutritional and medical therapy in an Ambulatory Therapeutic Feeding Centre (ATFC), be referred to an Inpatient Therapeutic Feeding Centre (ITFC) for specialised treatment and further medical evaluation and investigation (WHO, 2013[1]; WHO, 2013[2]; MSF, 2016). Médecins Sans Frontières (MSF) examined mor-

tality, causes of mortality and co-morbidities among children under five years of age admitted to an ITFC in three sites in Niger, for all cases and for poor responders to standard ITFC therapy.

Methods

This was a prospective study that included all children aged 6-59 months with SAM hospitalised in the ITFCs of Koutiala (Mali), Madarounfa (Niger) and Madaoua (Niger). All three sites were supported by MSF. SAM was defined by a weight-for-height z-score (WHZ) < -3 and/or mid-upper arm circumference (MUAC) < 11.5 cm and/or bipedal oedema (WHO, 2013[2]).

Poor response to ITFC therapy was defined as follows:

- In Koutiala and Madarounfa (MSF definition) – Stagnating weight or persistence of oedema or poor clinical evolution two weeks after admission, regardless of the clinical/anthropometric evolution prior to admission;
- In Madaoua (Niger National protocol definition) – Children with one of the following criteria: Clinical deterioration at any time after admission; failure to improve/regain appetite by Day 4; failure to start to lose oedema by Day 4; presence of oedema at Day 10; failure to fulfil criteria for discharge towards an ATFC by Day 12; stagnant weight for two to three weeks before admission.

Causes of mortality were the clinical diagnoses given by the on-call physician at time of death. Causes of morbidity were those identified during routine daily care and classified as primary and secondary causes of morbidity (at time of exit from the hospital). The analyses of causes of mortality and morbidity took only primary diagnoses into account.

Routine data from the medical files of the patients were collected using a standard form. Data were entered in an Epidata database and analysed using Stata 13.

Results

In total, 2,765 children were included in the study: 1,337 children in Koutiala and 437 in Madarounfa (from 19 November 2014 to 18 February 2015) and 991 children in Madaoua (from 15 September to 14 December 2014). The sex ratio was around 1:1 in all three sites. Median age varied from 14 (IQR: 9-24) months in Madaoua to 24 (IQR: 12-24) months in Koutiala. Median length of stay was four to five days in all three sites.

Almost half of the admitted children were transferred from ATFCs. In Koutiala, 18% were admitted because of lack of response to treatment, whereas in Nigerien sites this applied to a smaller proportion of admissions (1.8% in Madarounfa and 8.8% in Madaoua). The evolution during hospitalisation was favourable for 90 to 94% of our study population. The inpatient mortality rates observed were 6.4%, 7.8% and 5.2% in Koutiala, Madarounfa and Madaoua respectively. The proportion of defaulters was 0.2%, 0.2% and 0.5% respectively.

The principle cause of morbidity was malaria: 30.0% in Koutiala, 61.3% in Madarounfa and 55.0% in Madaoua. Rapid diagnostic tests were done systematically at time of admission in all three sites. In all locations, *Plasmodium falciparum* is prevalent and no drug resistance has been described. The second and third leading causes of morbidity were: respiratory infection (9.3%) and anaemia (8.2%) in Koutiala; respiratory infection (8.9%) and sepsis (8.0%) in Madarounfa; and diarrhoea (26.6%) and respiratory infection (8.1%) in Madaoua.

Table 1 Causes of mortality and case fatality rates in children aged 6-59 months with SAM hospitalised in inpatient therapeutic feeding centres

	Koutiala (N=86)		Madarounfa (N=34)		Madaoua (N=51)	
	Proportional mortality, n (%)	CFR, %	Proportional mortality, n (%)	CFR, %	Proportional mortality, n (%)	CFR, %
Malaria	13 (15.1)	3.2	6 (17.7)	2.2	33 (64.7)	6.1
Respiratory infection	9 (10.5)	7.2	1 (2.9)	2.6	4 (7.8)	5
Diarrhoea	2 (2.3)	7.7	-	-	4 (7.8)	1.5
Hypovolemic shock	6 (7.0)	27.3	-	-	2 (3.9)	40
Sepsis	37 (43.0)	66.1	24 (70.6)	68.6	5 (9.8)	13.9
Meningitis	2 (2.3)	100	1 (2.9)	100	-	-
Tuberculosis	2 (2.3)	25	1 (2.9)	6.3	1 (2.0)	8.3
HIV	2 (2.3)	28.6	-	-	-	-
Anaemia	8 (9.3)	7.3	-	-	-	-
Other	5 (5.8)	1.1	1 (2.9)	4.2	2 (3.9)	33.3

CFR: case fatality rate

HIV testing in cases where HIV was suspected was undertaken in Koutiala and well accepted¹. HIV testing was not being performed in Madarounfa or Madaoua at the time of the study. In Koutiala, 11% of admitted children were tested based on clinical suspicion, among whom 8/149 (5.4%) were diagnosed as positive and started on treatment. Subsequently, in 2015, systematic HIV testing was implemented in Madaoua; around 0.5% of hospitalised malnourished children tested positive. Efforts have also improved in Koutiala, where nearly 50% of ITFC admissions were screened for HIV in 2016, with 1.9% (21/1,127) having a positive result. In Madarounfa, 36% of ITFC admissions were screened in 2016, with 1.9% (69/3,547) having a positive result.

The three leading causes of mortality were sepsis, malaria and respiratory infection (Table 1). In Koutiala, sepsis accounted for 43.0% of deaths, malaria for 15.1% and respiratory infection for 10.5%. In Madarounfa, 70.6% of the deaths were linked to sepsis, 17.7% to malaria and 2.9% to respiratory infection, while in Madaoua malaria was the principle cause (64.7%), followed by sepsis (9.8%) and respiratory infection (7.8%). The highest case fatality rates (CFR) were for meningitis, sepsis, hypovolemic shock, HIV and tuberculosis (TB).

Poor response to ITFC therapy was found in 7.6%, 4.6% and 23.6% of the study population in Koutiala, Madarounfa and Madaoua respec-

tively (the wider definition of the Nigerien national protocol was used in the latter site). Mortality among poor responders was 8.8%, 5.0% and 4.3% in Koutiala, Madarounfa and Madaoua respectively. The leading causes of mortality among poor responders were: malaria, diarrhoea, sepsis, respiratory infection (including TB) and HIV.

Discussion

Mortality in children aged 6-59 months with SAM hospitalised in the three ITFCs was moderate when compared to international standards (5% to 10%) (Black et al, 2013) and lower than the mortality rates seen in other series (Ahmed et al, 2014; Patel et al, 2010; Page et al, 2013; Mahgoub & Adam, 2012; Dubray et al, 2008; Prudhon et al, 1997; Pécoul et al, 1992). Main causes of mortality: sepsis, malaria and respiratory infections, were similar to previous publications (Page et al, 2013; Mahgoub & Adam, 2012).

The higher proportional mortality due to malaria in Madaoua is probably linked to the timing of the malaria season in this site during the study period. Differences in the proportional mortality by site may also be due to reporting, as only the primary cause of mortality is taken into account in this analysis. Cause of death for cases with unclear diagnosis or with several concomitant pathologies may have been reported differently in the three sites. A large number of these cases may have been diagnosed as sepsis, particularly in Madarounfa and Koutiala.

Respiratory infection was an important cause of mortality in all sites and TB was described as the primary cause of death in a few of patients. Case fatality rates were particularly high for TB, probably due to delayed diagnosis. Due to the difficulties in diagnosing TB in malnourished children (lack of diagnostic tools and difficulties for children in producing sputum samples), some patients with TB may have been diagnosed and treated as having a respiratory infection of other origin.

Finally, in Koutiala, where a considerable number of children with SAM were selectively screened for HIV, a significant proportion were diagnosed as positive, compared to the adult prevalence rate in Mali (1.3% in 2015) (UNAIDS, 2015). However, post-study programmatic data from the three sites showed a lower HIV rate among hospitalised, malnourished children when HIV testing was systematic, particularly in Madaoua. HIV prevalence among hospitalised, malnourished children should therefore be locally assessed through HIV systematic testing in order to inform an HIV-testing strategy that might be different depending on the context.

For more information, contact: Helena Huer-ga, email: helena.huerga@epicentre.msf.org



Phase 1 facilities in Koutiala hospital

¹ Rapid HIV tests were available on site and DNA Polymerase Chain Reaction (PCR) in the country capitals (three months delay in getting results).

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Anthropometric cut-off points for older children and adolescents in Syria

By Paluku Bahwere



Paluku Bahwere is a paediatrician with over 25 years of experience in operational research and programming in the fields of public health, paediatrics, nutrition and HIV/AIDS. He joined Valid International in 2003 and since then, has provided technical support to Ministries of Health in Malawi, Zambia, Zimbabwe and Mali, and supported a number of international NGOs. In 2006, he became Valid

International's Research Focal Person and has led the design, implementation and analysis for several large cluster randomised trials.

The author acknowledges UNICEF Syria for initiating the research and for their valuable input and contributions. Thanks also to Sarah Jones and Kate Sadler, Valid International, for their help in coordinating this article for Field Exchange.



We are delighted to include this article on innovation in assessment of acute malnutrition in older children, adolescents and adults in Syria, a known gap area for many years. The process and considerations in arriving at the proposed criteria are transparent; preliminary discussions are underway for a follow-up study to test the criteria. This initiative should undoubtedly inform global guidance, not only in terms of content but approach (Eds).

Location: Syria

What we know: There is a lack of guidance on assessment and treatment of acute malnutrition where population access is severely hampered, staff capacity is limited and children over five years are affected. This is currently the situation in Syria.

What this article adds: Valid International, in collaboration with UNICEF Syria, has developed contextualised mid-upper arm circumference (MUAC) cut-off points for older children, adolescents and adults to meet critical assessment needs in Syria. This is part of a larger package of work that includes development of contextualised treatment protocols. The cut-offs are based on extensive review of relevant published and grey literature; primary data were lacking. Key considerations were simplicity (hence the selection of MUAC) and the necessity for early identification in a conflict context where individuals need to remain mobile and independent; given this, functional criteria are also proposed. The cut-offs will be applied to a pilot of a nutritional surveillance system for hard-to-access and inaccessible areas targeted by UNICEF in Syria. Discussions are underway about a short follow-up study to determine the diagnostic performance of proposed cut-offs.

Introduction and context

As part of a package of work, Valid International (Valid) has been undertaking for UNICEF Syria since mid-2016¹, Valid has developed contextualised mid-upper arm circumference (MUAC)

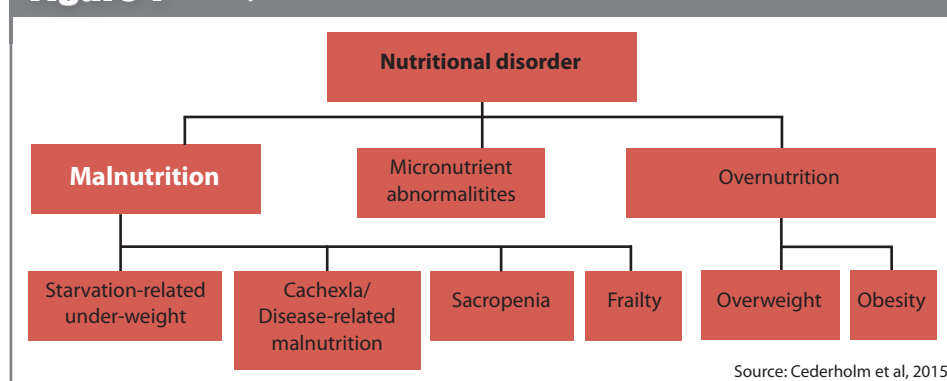
cut-off points for older children and adolescents in areas where access issues prevent direct assessment of height-related indices. These were developed to inform continuous data collection and analysis and intervention design. The in-

attention was to draw on primary data to determine appropriate cut-offs for these age groups in besieged areas in Syria. However, due to the paucity of survey and other data available, primary analysis was not possible. Instead, we undertook an extensive review of published and grey literature on MUAC distribution in children, adolescents and pregnant and lactating mothers from the Middle East region. This article shares the outcome of that review and presents the proposed cut-offs. It is worth noting that, as they stand, these cut-offs are a 'best estimate' based on accessible data and material and would ideally be verified as appropriate through primary research; this is being explored (see 'Next steps' below).

Background

The conflict in Syria has devastated the country and its people. An estimated 11 million Syrians are no longer living in their homes and are either internally displaced persons (IDPs) (6.5m) or refugees in neighbouring countries (4.1m). At least 8.7 million people are unable to meet their food needs. Households in hard-to-reach and besieged areas have provoked the highest concern, since they are the most in danger and the most food-insecure (HNO, 2016). It is estimated that 2.5 million people out of the 4.5 million people living in these areas are severely food insecure. The prevalence of acute malnutrition (AM) was 7.2% in children aged 6-59 months in 2014 (Rapid Nutrition Assessment in IDPs, 2014). Ongoing fighting, population movements and insecurity pose challenges of access and provision of adequate nutrition services to women and children in some areas (Humanitarian Response Plan, 2016). As the situation in the besieged areas continues to deteriorate, with limited nutrition information available, UNICEF has made additional efforts to gather both formal and in-

Figure 1 Conceptual tree of nutritional disorders



¹ The package involves: 1) recommending MUAC cut-offs; 2) developing contextualised treatment protocols and training materials for their implementation; and 3) developing a surveillance and data collection system for nutrition monitoring in besieged areas and online training materials for its use.

Table 1 Definition of malnutrition in older children, adolescents and adults according to the World Health Organization (WHO) and the American and European scientific nutrition committees

Population group	Indicator	Statistic	Severity classification	Reference
Children and adolescents	Weight, height or length, MUAC, skinfolds, BMI-for-age	Z-score	Z-score <-1: Mild or at risk Z-score <-2 and ≥-3: Moderate Z-score <-3: Severe	ASPEN ESPEN WHO
	Weight loss	% weight loss	↓5%: Mild or at risk ↓7.5%: Moderate ↓10%: Severe	ASPEN
	Deceleration of WFH Z-score	Z-score	↓1 Z-score: Mild or at risk ↓2 Z-score: Moderate ↓3 Z-score: Severe	ASPEN
Adults	Weight loss	% unintentional weight loss	Moderate ↓5% within 1 month ↓7.5% within 3 months ↓10% within 6 months ↓20% within 12 months Severe ↓>5% within 1 month ↓>7.5% within 3 months ↓>10% within 6 months ↓>20% within 12 months	ASPEN
			Unintentional Weight loss	Moderate to severe >5% within 3 months >10% indefinite of time
	Body Mass Index (BMI)	Set cut-offs	17.0-18.4 kg/m ² : Mild 16-16.9 kg/m ² : Moderate <16 kg/m ² : Severe	WHO
			Moderate to severe <20 kg/m ²	ESPEN
	Fat Free Mass Index (FFMI)	Set cut-offs	Moderate to severe < 17 kg/m ² : men < 15 kg/m ² : women	ESPEN
	Mid Upper Arm Circumference (MUAC)	Set cut-offs	161-185mm: Moderate <160mm: Severe	WHO (IMAI)*
Percentile			Moderate to severe <10th age and sex percentile	Washington cachexia consensus

*IMAI: Integrated Management of Adolescent and Adult Illness

Table 2 Criteria for initiating special care in adults with starvation-related undernutrition proposed for use in humanitarian crises

Population group	Indicator	Criteria combination	Severity classification	Reference
Adult from 18 years	Combination of MUAC, ability to stand, famine oedema, apparent dehydration and social environment	MUAC cut-offs + clinical signs + social environment	Moderate MUAC between 160-185 mm and no clinical signs as defined by CHANCES ² Severe 1. MUAC<160 mm 2. MUAC between 160-185 mm and clinical signs as defined by CHANCES 3. Famine oedema of Beattie grade 3 or above	Steve Collins and Concern and Valid International
Adults 18 to 50 years	Combination of BMI, weight loss history, ability to stand or physical strength, famine oedema, mental health status, social environment	MUAC cut-offs + clinical signs + social environment	Moderate BMI between 15 and 17 kg/m ² and no sign of severe undernutrition listed below Severe 1. BMI<15 kg/m ² 2. objective recent weight loss >10% 3. inability to stand or general physical weakness 4. Severe apathy 5. Famine oedema 6. Anorexia	Navarro-Colorado and ACF

formal data on the nutrition situation of children through MUAC screening in 2016.

Justification

Due to access challenges in hard-to-reach and besieged areas, AM has been reported in multiple age groups that include children under five years, older children aged 5-10 years, adolescents and even adults. Several challenges are faced in performing sound measurement in identifying malnutrition among the above mentioned age groups, including:

- Absence of valid MUAC cut-off points for children over five years, adolescents and adults to classify their nutritional status; currently recommended definitions of AM require height measurement, which is hard to obtain in these areas;
- Lack of contextualised treatment protocols to address malnutrition among children over five years, adolescents and adults living in these areas; and
- Difficulties in providing capacity-building support to the limited numbers of health workers inside these areas.

Developing rapid nutrition-needs assessment tools, contextualised treatment protocols and a monitoring mechanism for AM in older children, adolescents and adults living in these areas will greatly contribute to efforts to minimise the impact of AM. This research was commissioned as part of a larger piece of work aiming to address the gaps listed above. This article describes the approach and outcome in defining contextualised, MUAC-based cut-offs that can be used to define and help in the early detection and treatment of AM among all age groups.

Review findings

Definition of undernutrition: current consensus

Undernutrition can be defined as a state of nutrition in which an imbalance of energy, protein and other nutrients causes measurable negative effects on body and tissue shape, size and composition, resulting in the alteration of body functions and adverse clinical outcomes. Undernutrition is an umbrella term for various nutrition-related (see Figure 1) (Cederholm et al, 2015). For the present work, the focus was on starvation-related underweight. Sarcopenia, used to describe loss of muscle mass and strength of any origin, was also used during the literature search (Muscaritoli et al, 2010).

A series of meetings have taken place to reach consensus on defining malnutrition in older children, adolescents and adults (Table 1) (Cederholm et al, 2015; Muscaritoli et al 2010; Becker et al, 2015; Malone & Hamilton, 2013). While there is consensus that the initiation of special care for undernutrition is at the onset of body function impairment, the different committees did not include this criterion, probably because of the scarcity of

² The Concern Health and Nutrition Evaluation Score (CHANCES) (Collins et al, 2000.)

Table 3 Admission and discharge criteria in therapeutic feeding in selected national and international organisations' guidelines³

Population group	Admission criteria	Discharge criteria	Document	Country/organisation
5-9 years	- Bilateral pitting oedema or - MUAC<135 mm - BMI-for-age <-3 Z-score (alternative to MUAC)	15% weight gain	National CMAM guidelines	Sudan, South Sudan
6 months-12 years	- WFH or WFL <-3 Z-score (WHO standards) or - MUAC<110 mm if length<65 cm or - MUAC<115 mm if length≥65 cm or - Bilateral pitting oedema	- WFH/WFL ≥-1.5 z-score if follow up or - WFH/WFL ≥-1.0 z-score if no follow-up and MUAC>115mm and No oedema for 14 days	National CMAM guidelines	Yemen
10-18 years	- MUAC<160 mm - BMI-for-age <-3 Z-score (alternative to MUAC)	Good appetite, sustained weight gain, reliable source of food	National CMAM guidelines	Sudan, South Sudan
	- MUAC<160 mm or - WFH <-3 Z-score		National CMAM guidelines	Somalia
12-18 years	- WFH/WFL <70% (NCHS) or - Bilateral pitting oedema	WFH or WFL ≥85% and 14 days without oedema	National CMAM guidelines	Yemen
	- WFH/WFL <70% (NCHS) or - Bilateral pitting oedema	WFH or WFL ≥85% and 14 days without oedema	MSF clinical guidelines	MSF
6 months to 18 years	- WFH or WFL <70% of the median reference or - MUAC<110 mm or - Bilateral pitting oedema	WFH or WFL ≥85% and 14 days without oedema	National CMAM guidelines	Ethiopia
Adults (excluding pregnant and lactating women)	- Bilateral pitting oedema or - MUAC<185 mm or - BMI< 16.0 kg/m ² (alternative to MUAC)	Good appetite, sustained weight gain, reliable source of food	National CMAM guidelines	Sudan, South Sudan
	- MUAC<170mm or - MUAC<180 mm if recent weight loss or - BMI<16 kg/m ² or - Bilateral pitting oedema		National CMAM guidelines	Ethiopia
	- BMI<16 kg/m ² if recent weight loss or - Bilateral pitting oedema		National CMAM guidelines	Somalia
	- BMI<16 kg/m ² if recent weight loss or - Bilateral pitting oedema	- BMI>17.5 kg/m ² and - MUAC >185mm and - No oedema for 14 days	National CMAM guidelines	Yemen
	- BMI<16 kg/m ² - MUAC< 224mm (men) - MUAC<214 mm (women)		Guidelines for use in refugees and IDP camps	UNHCR (2011)
	MUAC<210mm		Criterion used in nutrition surveys among Syrian refugees (women 15-49 years)	WFP
	MUAC<160mm or MUAC 160-185mm + 1 clinical sign (oedema, inability to stand, sunken eyes)	- Eating well and gaining weight + - reliable source of nutritious food + Other medical problems diagnosed and under treatment	Integrated Management of Adolescent and Adult Illness (IMAI) guidelines	WHO
	MUAC<160mm or MUAC <185mm + poor general condition (oedema, inability to stand, apparent dehydration)	10-15% weight gain and oedema below Beattie grade 2	MSF clinical guidelines	MSF
Pregnant and lactating women	MUAC<210 mm if recent weight loss		National CMAM guidelines	Somalia

published data linking body function and proposed anthropometric indicators, especially for starvation-related undernutrition.

The only study conducted in a non-humanitarian context surveyed adolescents with anorexia nervosa and concluded that MUAC is better than Body Mass Index (BMI) in predicting body function and proposed cut-offs of 200 mm for initiation of special nutrition care (Martin et al, 2009). The other studies conducted during humanitarian crises evaluated risk of death based on both BMI and MUAC (Collins, 1993; Collins, 1995; Collins,

1996; Collins et al 2000; Collins & Myatt 2000; Collins et al, 1998; Navarro-Colorado 2000; Navarro-Colorado 2005). These studies yielded a different conclusion regarding the anthropometric indicator of choice, as illustrated by the derived guidelines presented in Table 2.

However, these may be too restrictive because they aim at minimising admissions in therapeutic feeding centres (hospitals) and have not yet fully integrated the benefit of community-based management. They are also aimed at a population that is not at risk of having to move in order to avoid bombing or location attacks

by armed groups. In this context, it is very important for individuals to remain mobile and to be able to walk independently, which suggests the need for earlier intervention.

Current practices for initiation of therapeutic feeding: Selected examples

Criteria used in selected developing countries for diagnosing severe undernutrition and ini-

³ CMAM guidelines were accessed and downloaded from the CMAM forum website www.cmamforum.org.

Table 4 Type of information sought to determine contextualised MUAC cut-offs

Type of data	Nutrition survey	Programme data	Studies on body composition in anorexia nervosa, hunger strike or any malabsorption syndrome populations	Literature on anorexia nervosa, hunger strike or any malabsorption syndrome
Age	From 5 years of age	From 5 years of age	From 5 years of age	Older children and adolescents
Gender	Preferably both but unisex data can also be of use	Both	Preferably both but unisex data can also be of use	Both
Data collected	Availability of MUAC is the minimum; best database should include data allowing determination of physical performance or activity; other anthropometry including weight and height also needed	Programme data including admission parameters and outcomes; data should allow determination of predictive value for mortality of different MUAC cut-offs; the availability of functional parameters will be a big plus	Availability of raw data of bio-impedance analysis that can be coupled to MUAC data; possibility of also linking to physical performance will be the ideal situation	Availability of MUAC is the minimum; best paper should also include correlation between MUAC and other parameters such as body fat or body fat-free mass; papers with cut-offs for instauration of therapeutic feeding (oral or parenteral) in children with malabsorption syndrome will also be of use
Country and region to target	Any region or national data for Syria; any data from direct neighbouring countries including Turkey, Iran, Lebanon, Jordan, Iraq, even Ethiopia as suggested by the Unicef team	Syria, Iraq, Iran, Lebanon, Gaza, Jordan, Ethiopia, Turkey, Yemen, Somalia	Studies conducted in Syria or neighbouring countries (Turkey, Iran, Lebanon, Jordan, Iraq, Ethiopia)	All
Population surveyed	IDPs, refugees, stable population	OTPs, TFCs, SFPs or hospital patients admitted for SAM or MAM	Any population of older children, adolescent or adults including pregnant and lactating mothers	Older children, adolescents and adults
Circumstances of the survey	Routine surveillance or during humanitarian or cyclic hunger	Exclude diseases related malnutrition	NA	NA
Organisations to target	UNICEF; UNHCR; MOH; check also existence of recent DHS data; local research institutions	NGOS operating in the areas (MSF,CWW, ACF, SCI), UNICEFs, UNHCR, WFP	Research institutions; literature search in published and grey literature (thesis and other dissertations)	Authors of identified papers for data if all data we need not reported

tiating special nutrition interventions were reviewed. We found variability of both admission and discharge criteria. Efforts were made to retrieve the guidelines of countries closer to Syria or those in the same WHO geographic zone. See Table 3.

Definition of context-specific, MUAC cut-offs

Rationale for using MUAC

In 2009, the World Health Organization (WHO) and UNICEF endorsed the use of mid-upper arm circumference (MUAC) as an independent criterion for screening and assessing acute malnutrition among children aged 6-60 months and published updated guidelines recommending a MUAC cut-off of <11.5cm (WHO, 2013; WHO & UNICEF, 2009). The use of MUAC offers the advantages of a simple and relatively inexpensive measure (requires minimal equipment) that can be carried out in both community and facility-based settings, with acceptable accuracy and precision even by minimally trained frontline service providers (no calculations needed). The use of MUAC in children under five programming has improved the ability of CMAM programmes to increase coverage and recovery rates of treatment of severe acute malnutrition (SAM) in various contexts, including complex humanitarian crises and stable developmental situation (Collins, Dent et al, 2006; Collins, Sadler et al, 2006). A recent study has shown that in a group of children

aged from 3 to 14 years, MUAC correlates very well with body fat mass (BFM), whether they were healthy or suffering from Cystic Fibrosis (Chomtho, 2006). Similar findings have been observed in adolescents and adults, including pregnant women (Tang et al, 2013).

Many national guidelines for the management of acute malnutrition include MUAC cut-offs for admission and discharge of older children, adolescents and pregnant and lactating mothers. However, these criteria have rarely been used and have not yet been validated to confirm performance in selecting those in need of specialised nutrition intervention(s). In addition, these criteria vary from country to country, making it difficult to confirm suitability for the current Syrian context.

Methods

This work is based on a literature review and analysis of data from different sources. Table 4 summarises the information reviewed in order to complete the task of determining contextually suitable cut-offs for Syria confidently.

The objective of the literature review was to identify studies that describe correlation between MUAC measurement and body functions, including physical performance, cognitive functions and survival of the age groups of interest. Pubmed and google scholar were used for the literature search. References listed in the papers selected from the literature review were also used.

The objective for analysis of programme data was to help identify cut-offs currently used, the predictive value of MUAC for different outcomes and the diagnostics value of different MUAC cut-offs for identifying children with impaired body functions. We also aimed to get data that could enable us to determine correlation between MUAC and BFM and MUAC and Body Free Fat Mass (BFFM). Such a database would help to identify cut-offs corresponding to percentage of BFM and BFFM reduction. Finally, we aimed to obtain nutrition survey datasets from Syria or neighbouring countries to determine distribution of MUAC for the age groups of interest and AM based on the percentiles.

Outcome of the information search

The information search was successful in identifying published data that supported the determination of cut-offs based on the distribution of MUAC in the target age groups, but was unsuccessful in acquiring data that allowed us to confirm the capacity of these cut-offs to select

⁴ The Third National Health and Nutrition Examination Survey, NHANES III, was a nationwide nutrition survey of the US population aged two months and older. This survey is used to define international nutrition standards, including definition of malnutrition. The cohort was studied using several techniques to define normal range of body fat and body free fat mass in all age groups.

⁵ Studies conducted in the region to assess body composition of adolescents, notably in Iranian children, showed that children of the region have higher body fat mass than that of the NHANES-III cohort.

Table 5 Proposed cut-offs for SAM

Age group	Cut-offs	
	ADMISSION	DISCHARGE
5-9y	<140mm	>160mm
10-14y	<160mm	>180mm
15-17y	<200mm	>230mm
≥18y	<220mm	>235mm

Table 6 Proposed cut-offs for MAM

	ADMISSION	DISCHARGE
5-9y	<145mm	>160mm
10-14y	<170mm	>180mm
15-17y	<210mm	>230mm
≥18y	<225mm	>235mm

those with functional impairment or risk of negative outcomes. The key documents used for the determination of the cut-offs were:

1. *Cross-sectional reference values for mid-upper arm circumference, triceps skinfold thickness and arm fat area of Turkish children and adolescents* (Ozturk et al, 2009).
2. *Arm Anthropometry Indices in Turkish Children and Adolescents: Changes Over a Three-Year Period* (Cicek et al, 2014).
3. *New reference values for mid upper arm circumference of Shiraz (Iran) primary school children* (Ayatollahi & Shayan, 2008).
4. *Nutrition assessment – Syrian refugees in Lebanon* (2015).
5. *Syrian women SMART survey database*.
6. *Compilation of data of school-age children admitted in various Valid International programmes*.
7. *Compilation of data of chronically sick adults enrolled in various Valid International research programmes*.
8. *Guidelines for an integrated approach to the nutritional care of HIV-infected children-6 months-14 years* (WHO, 2009 [2]).
9. *The assessment and treatment of severe adult malnutrition* (Collins, 2001).

Proposed cut-offs

Severe acute malnutrition

The principles and assumptions considered for defining the cut-offs are:

1. 5-9 year old and 10-14 year old children:
 - a. Severe acute malnutrition is confirmed when there is evidence of recent weight loss of over 10% of the usual weight.
 - b. Distribution of MUAC is similar to that of the Third National Health and Nutrition Examination Survey (NHANES-III)⁴ children, although Syrian children are likely to have slightly higher BFM for the same anthropometry⁵.
 - c. Early loss of body mass is mainly fat.

- d. Treatment has to start when children are still ambulatory and at low risk of superimposed complications.
- e. In the absence of data supporting determination of body-function based cut-offs and the absence of MUAC reference data for Syrian children, MUAC references for Turkish and Iranian children have been used.
- f. Third percentile value for the lowest age of age category has been used to define admission cut-offs.
- g. The value representing the 25th percentile of the middle of the age category is used for discharge cut-offs.
- h. The limited existing evidence from African programmes shows that children in these age groups (admitted using weight-for-height Z-score<-3 criterion) had MUAC at admission up to 172 mm for the age group 5-9 years and up to 182mm for those in the age group 10-14 years. These children were responding well to the treatment.

2. 15-17 year old adolescents:
 - a. Treatment aims to both improve nutritional status of women and prevent negative adverse outcomes of eventual pregnancy, including low birth weight.
 - b. Severe acute malnutrition is confirmed when there is evidence of recent weight loss of over 10% of the usual weight.
 - c. Distribution of MUAC is similar to that of NHANES-III children, although Syrian children are likely to have slightly higher BFM for the same anthropometry.
 - d. Treatment has to start when the adolescents are still ambulatory and at low risk of superimposed complications.
 - e. Studies have shown that most adolescents with MUAC <200mm due to semi-starvation (anorexia nervosa) remain active and clinically well, but that those with MUAC < 200 mm often need special medical/nutrition attention

(Martin et al, 2009).

- f. Studies in anorexia nervosa have shown that, with appropriate treatment, nutrition recovery (MUAC ≥ 230mm) occurs within three months.
3. ≥18 year olds:
 - a. Severe acute malnutrition is confirmed when there is evidence of recent weight loss of over 10% of the usual weight.
 - b. Studies have shown that risk of low birth weight is increased in children whose mothers had MUAC<220mm during pregnancy.
 - c. For Syrian refugees and internally displaced persons, humanitarian agencies use <210 mm as the cut-off for severe wasting and <230mm for wasting to assess the nutrition status of woman of reproductive age.
 - d. Treatment has to start before severe impairment of physical performance, meaning when the women are still ambulatory and at low risk of superimposed complications.

Based on the above listed principles or assumptions, the proposed cut-offs are as indicated in Table 5.

Moderate acute malnutrition

The principles and assumptions considered for defining the cut-offs are:

1. 5-9 and 10-14 year-olds:
 - a. Children with MUAC below 5th percentile in the normal distribution of MUAC are likely to have weight loss well above the 10% mark and be at risk of SAM.
 - b. Any mild acute infection can lead to deterioration to SAM.
2. 15-17 year old adolescents:
 - a. Children with MUAC< percentile 5 cut-offs are likely to have weight loss well above the 10% mark and be at risk of SAM.
 - b. Use of percentile 5 will not result in an



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excessive increase of eligible adolescents.

A maximum of 5% will be eligible.

- c. For Syrian refugees and internally displaced persons, humanitarian agencies are using <210 mm as the cut-off for severe wasting and <230mm for wasting to assess the nutrition status of woman of reproductive age, including adolescents from 15 years of age.
3. ≥18 year olds:
 - a. Studies have shown that risk of low birth weight is increased in children whose mothers had MUAC<220mm during pregnancy.
 - b. For Syrian refugees and internally displaced persons, humanitarian agencies are using <210 mm as cut-off for severe wasting and <230mm for wasting for assessing the nutrition status of women of reproductive age.

Based on the principles or assumptions above, the proposed cut-offs for MAM are as indicated in Table 6 below.

Body functions and acute malnutrition

Deterioration of nutrition status is also associated with cognitive and physical impairments and these impairments manifest before individuals qualify for nutrition intervention based on anthropometric criteria (Genton et al, 2005). Early initiation of treatment of SAM has been key in the success of CMAM by reducing the proportion of children under five

years old who start treatment with superimposed medical complications (Collins, Dent et al, 2006). A similar approach should be taken for the other age groups to maximise treatment uptake and success. Several parameters can be used to assess cognitive and physical function for determination of eligibility for nutrition intervention and monitoring of the response to the intervention (Ozturk et al, 2009). These include handgrip strength (HGS), ability to stand, ability to walk independently, the timed up and go (TUG) test, six-minute walk test, and ability to perform activities of daily living (ADL) independently. However, in war-ravaged and besieged areas there is a need to minimise assessment time and consequently only simple and time-saving indicators should be used. The proposed indicators to be used for confirming starvation impact on body function are:

1. General attitude and alertness
 - a. Lethargy/fatigue.
 - b. Somnolence (strong desire to sleep).
 - c. Extreme lethargy and inertia.
2. Muscle strength
 - a. Ability to sit and stand up independently.
 - b. Ability to move independently.
 - c. Walking speed.
3. Others
 - a. Appetite (abnormal if reduced).
 - b. Pulse rate (abnormal if <40bpm or >60 bpm at rest).
 - c. Body temperature (abnormal if hypothermia as defined locally-<35.5°C).

d. Famine oedema.

Based on these signs, a decision to admit or not can be made. Inpatient referral should also be made for those who fulfil either or both of the criteria below:

1. Bedridden (not ambulatory and unable to complete activities of daily living independently).
2. Medical condition requiring hospital management as per IMAI guidelines (WHO, 2011).

Next steps

The MUAC cut-offs proposed here will now be applied to a pilot of a nutritional surveillance system for hard-to-access and inaccessible areas targeted by UNICEF in Syria. However, these cut-offs are based on secondary data describing the distribution of MUAC in relevant populations. Their performance in identifying individuals for therapeutic nutrition intervention would ideally require confirmation against common parameters of starvation-related body function impairment. We would therefore like to undertake a short follow-up study to determine the diagnostic performance of the proposed cut-offs and verify that they are the correct cut-offs to use. Beyond the immediate benefit in the Syrian context, our hope is that such a study would also have wider global implications, with the potential to contribute new knowledge to the international nutrition in emergencies community.

For more information, contact: Kate Sadler, kate@validinternational.org

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A farmer in her recently harvested cauliflower garden in Bhagwanpur, Nepal

Based on data collected in Uganda, Nepal and Ethiopia, a recent series of papers in a Food and Nutrition Bulletin supplement fills a critical gap in evidence regarding multi-sector National Nutrition Action Plans (NNAPs). The studies offer new data and new thinking on how and why governance, effective financial decentralisation and improved accountability all matter for nutrition actions in low-income countries. Here we share main findings in four of the seven papers. All are available (open access) at www.journals.sagepub.com/toc/fnba/37/4_suppl

Optimising the multi-sectoral nutrition policy cycle: a systems perspective

Summary of research¹

There is little empirical evidence or primary research to support the effectiveness of multi-sector approaches to address undernutrition. Despite a lack of hard evidence, there is a resurgence of interest in these approaches. A number of countries and agencies have initiated global and country-level efforts to implement and scale up multi-sector programmes and policies. The United States Agency for International Development (USAID) Feed the Future Initiative; USAID's Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project; the Global Alliance for Improved Nutrition; the World Bank's Secure Nutrition platform; and the United Nations REACH mechanism are examples. Two key initiatives, the Scaling up Nutrition (SUN) Movement and 1,000 Days, have been endorsed by a range of stakeholders, donors, and countries. As of May 2016, 57 countries had signed up to the SUN Movement, committing to scaling up nutrition efforts and agreeing to abide by several principles of engagement, including "open multi-stakeholder partnerships that bring proven solutions and interventions to scale".

SUN Movement signatories are typically encouraged and supported to develop multi-sector NNAPs and policies. These come in many forms, but share a commitment to nutrition, the inclusion of two or more sectors, and the creation or modification of a coordinating structure or mechanism. Unfortunately, countries are still crippled with operational challenges and complexities of coordination and implementation of NNAPs. A multi-sector approach to nutrition requires thoughtful planning, broad stakeholder engagement across a diverse set of stakeholders (who may not speak the same technical language or have the same goals in mind), and sustained coordination throughout policy and programme implementation. As with any systems-strengthening effort, multi-sector nutrition may also take a longer time to achieve goals, such as scale-up of nutrition activities, because alliances and systems to support such a broad-based effort have to be built. This can create fatigue and doubt among stakeholders when results are not immediate.

This series of articles in the Food and Nutrition Bulletin takes a step toward filling the

critical gap in evidence on multi-sector NNAPs. It asks a number of questions about how NNAPs can have the greatest impact on reducing malnutrition. What challenges are involved in designing and implementing NNAPs? Are they understood and used by critical stakeholders? How do stakeholders from multiple sectors and levels understand their role in nutrition planning, budgeting, and implementation? Can the commitment and capabilities of policy stakeholders affect collaborative efforts to achieve national nutrition goals? Can NNAPs influence nutrition governance, or the extent to which nutrition is prioritised in plans and budgets?

This supplement presents findings from studies conducted in Ethiopia, Nepal and Uganda, all of which have a multi-sector nutrition plan or policy in place.

¹ Lamstein S, Pomeroy-Stevens A, Webb P, Kennedy E. *Optimizing the Multisectoral Nutrition Policy Cycle: A Systems Perspective. Food and Nutrition Bulletin Vol 37, Issue 4_suppl, 2016. www.ncbi.nlm.nih.gov/pubmed/27909256*

Prioritising and funding the Uganda Nutrition Action Plan

Summary of research¹

Location: *Uganda*

What we know: The Government of Uganda (GoU) is committed to tackling high rates of malnutrition through a multi-sector approach, reflected in the Uganda Nutrition Action Plan (UNAP) 2011 to 2016.

What this article adds: A two-year study documented if and how the UNAP influenced the enabling environment for nutrition action at national and district (two sites) levels, focusing on enabling factors, prioritisation and funding. There was significant improvement in multi-sector coordination of nutrition and UNAP and advocacy increased over the two-year timeframe. Nutrition accounted for 1% of the total GoU budget for 2014 to 2015. Ninety-six per cent of nutrition funding from external development partners (the majority of total nutrition-related allocations) was provided off-budget, with no public record of expenditure. After two years, donors, UN groups and the private sector still looked to internal policies to inform national and strategic funding decisions around nutrition, rather than the UNAP. Findings suggest the UNAP has enabled nutrition through influence on multi-sector coordination, advocacy and moderate adaptation of the plan to local needs. Improvements in prioritisation of nutrition for four of seven ministries was observed. Progress has been slow on realising a unified identity for nutrition, securing greater human resources and establishing sustainable structures, limiting development of new UNAP-related activities within the study period. Strong foundations have been laid for scale-up; a longer timeframe (five-plus years) may be needed to see change.

The Uganda Nutrition Action Plan (UNAP) 2011 to 2016 was borne out of the 2010 United Nations General Assembly, where the Government of Uganda (GoU) committed to tackling high rates of malnutrition through a multi-sector approach. The UNAP suggests a set of nutrition activities across five major objective areas, six sector ministries and various non-government stakeholder groups (external development partners (EDPs)). The UNAP coordination secretariat was sited in the Office of the Prime Minister (OPM) to signal high-level commitment to nutrition. The OPM is responsible for coordination of all UNAP activities but does not implement nutrition activities directly. The 2011 UNAP gap analysis identified several remaining barriers to addressing malnutrition effectively in Uganda. These included: weak advocacy at all levels; weak infrastructure, coordination and information management systems; limited involvement of communities in nutrition work; and low coverage of nutrition services at all levels. The UNAP objectives were designed to address these barriers.

The objective of the Uganda Pathways to Better Nutrition (PBN) study, designed by the SPRING project in collaboration with the OPM, is to document if and how the UNAP influenced the enabling environment for nutrition action (including enabling factors, prioritisation and funding) over two years (2013-2015). This focus was for several reasons; even well executed policies and plans cannot immediately impact nutritional status and must be operationalised, which takes time, especially when many sectors

are involved. The observation period of two years meant focusing on areas where change was expected in this timeframe. The study was timed to capture a significant portion of the UNAP (2011-2016) but was not designed to measure the impact of the plan.

The study followed four key study questions and, to the authors' knowledge, is the first prospective study on multi-sector nutrition policy processes in Africa. The study used a longitudinal, mixed-method design whereby both the qualitative and budget components ran over the same two-year period but used a different timescale.

Stakeholder groups

At the national level, the study followed six distinct stakeholder groups: government, donors, United Nations (UN) groups, civil society organisations (CSOs), academia and the private sector. Within government, representation was sought from each nutrition-related ministry and from policy and oversight bodies related to the UNAP (OPM, National Planning Authority (NPA), Ministry of Finance, Planning and Economic Development (MoFPED), and any related parliamentarians). The UNAP-related ministries included Ministry of Agriculture, Animal Industry, and Fisheries (MAAIF); Ministry of Education, Science, Technology and Sports (MoESTS); Ministry of Gender, Labour and Social Development (MoGLSD); Ministry of Health (MoH); Ministry of Local Government (MoLG); and Ministry of Trade, Industry, and Cooperatives (MTIC). The Ministry of Water

and Environment (MWE), while not an official UNAP signatory, has become involved in the implementation of UNAP activities, thus OPM requested its inclusion in this analysis.

Two case-study districts that have already begun the UNAP rollout process, Kisoro and Lira, were selected to provide a sub-national perspective. The same stakeholder groups were followed in the districts, with some modifications. First, all members of the District Nutrition Coordination Committee (DNCC) were included. Second, few donor and UN agencies had district-level representation; instead representatives of key projects funded by these agencies were selected. Third, community-level opinion leaders and community-based organisations were also included.

Process

Two rounds of structured, key informant interviews (KIIs) were conducted with 26 national-level stakeholders and 47 district-level stakeholders. Nationally, semi-structured follow-up interviews were also conducted quarterly in the intervening period, depending on the news and events. In the districts, some focus group discussions were used when individual interviews could not be arranged. Finally, observation of turnover in position holders was also recorded.

Weekly news searches were conducted for six news outlets using a set of search terms to identify activities, events and actions related to individual and institutional nutrition stakeholders in all six groups, nationally and in both districts. In total, 262 articles were included across the study timeframe. Study team members tracked official UNAP stakeholder meetings and notes from other nutrition-related meetings, trainings and workshops. Any new or changed activities listed in these documents was noted.

Findings

Enabling factors and prioritisation

In general, there was good existing understanding of the UNAP at the start of the study and positive changes over the course of the study in understanding the concept of multi-sector nutrition efforts, but persistent confusion about specific roles stakeholders could play to support the policy.

There was significant improvement in multi-sector coordination of nutrition and UNAP activities in the latter half of the study. Some of the most meaningful examples included increased participation in the national multi-sector coor-

¹ Pomeroy-Stevens A, D'Agostino A, Adero N, Foehringer Merchant H, Muzoora A, Mupere E, Agaba E and Du L. Prioritizing and Funding the Uganda Nutrition Action Plan. Food and Nutrition Bulletin 2016, Vol. 37(4S) S124-S141



Boaz Musiimenta, Office of the Prime Minister, Uganda introduces the PBN Uganda Final Report at the Kampala dissemination event in January 2016

dination structure (meetings, trainings, etc) by the donor and UN groups. Inter-sector coordination across units and departments also increased within almost all ministries and district-level coordination structures were established in Kisoro and Lira.

Advocacy for nutrition also appeared to increase over the course of the study period and building up to the launch of the National Development Plan II (NDP II) in mid-2015. Advocacy efforts organised by OPM, NPA and CSOs pushed nutrition to a higher priority level in the NDP II than in the previous NDP. At the district level, staff within the health sector were found to have advocated for the inclusion of nutrition in the next round of district development plans. Many stakeholders suggested that advocacy is most needed within the MoFPED to lobby for funding.

The study found moderate improvements (relative to other factors) in adaptation of the UNAP to local needs. The most notable change in this area was the development and launch of the National Nutrition Planning Guidelines for Uganda, released near the end of 2015, which offers a more practical understanding of what the UNAP means for planning and implementation by government stakeholders. The OPM (with the support of EDPs) also developed and launched a series of UNAP trainings in over half of all districts to orient DNCCs about the nutrition planning process. The DNCCs were, in turn, working to engage sub-county nutrition coordination committees (SNCCs) and parishes in their planning processes by the second round of district data collection, to take into account the needs of the community. However, DNCCs in both case-study districts mentioned that even when they were aware of local needs, they were not necessarily able to address them since the conditionality of national-level grants did not provide flexibility to develop and implement targeted programmes. The functionality of DNCCs and SNCCs across the country also varied, depending on the EDP support.

There was a persistent call for greater human resources for nutrition throughout the study period, for both planning and implementation. Concerns focused on availability, capacity and excessive turnover of existing staff. While some small positive changes were noted with regard to structures over the study period, most represented nascent movement rather than fully fledged change in sustainable structures. Remaining barriers included insufficient financial buy-in by the GoU, a lack of specific funding for nutrition or the UNAP, particularly at the district level, and an unapproved monitoring and evaluation (M&E) framework that lacked ministry implementation guidance.

While several non-traditional nutrition sectors did not identify nutrition as their priority at the beginning, responses from KIIs conducted towards the end of the study indicate improvements in prioritisation for four of the seven ministries. Three ministries (MAAIF, MoH and MTIC) took multiple steps in 2015 to get inter-ministry agreement to include nutrition as a named priority in their development strategy and investment plans, which is understood as the primary sector document used for priority-setting each fiscal year. In addition, by the end of the study, the MoLG treated nutrition as a formal, crosscutting issue in its planning process and also launched the sub-national, nutrition-planning guidelines. Changes were also seen within MoGLSD that culminated in the ministry successfully lobbying parliament for a new activity to support children; the majority of this activity will focus on feeding programmes. All of these changes evolved over the course of the study and stakeholders most often cited the positive changes previously mentioned in inter-ministry coordination, increased advocacy and improved planning structures as enablers of these changes.

Less obvious changes were observed in the prioritisation of nutrition among donors, UN groups and private-sector stakeholders. At the end of the study, they still said they primarily followed internal planning and policy documents for national and strategic funding decisions. Some donor and UN groups indicated that their intention was to use the UNAP to update internal strategies, but given the five-year life of many of these policies, this had not yet happened. Most EDPs did note that their activities were funded and planned in cooperation with the GoU, so national priorities were always considered. However, only one donor listed the UNAP in the top tier of national plans consulted when planning nutrition activities. Other factors mentioned as barriers to further EDP prioritisation were lack of M&E feedback structures for nutrition programming and high turnover of EDP staff in positions that could advocate for nutrition during work plan development.

Little evidence was found of implementation of new nutrition projects explicitly developed to support UNAP activities or existing projects that have increased alignment with the UNAP. While a handful of new nutrition activities were implemented during the study time period, im-

plementation was usually the result of existing EDP priorities, non-UNAP government plans or priorities, or non-UNAP-related assistance requests by districts. In the two study districts, there was a modest increase in nutrition activities between the first and second rounds of interviews, but only the UNAP trainings were explicitly conducted in support of the plan. With little evidence of new or expanded nutrition activities, this limits how much change can be expected to be seen in financing for nutrition.

Financing

The study found that funding allocations did not increase over the two years of data included in the study. Differences were observed by funding mechanisms (on and off budget) and sources (GoU and EDP) and UNAP objective area. In addition, there was some volatility in expenditure rates across all categories of nutrition funding. Funding for nutrition exists across multiple funding mechanisms and sources, but on-budget levels remain stagnant.

Combined nutrition allocations in 2014 to 2015 totalled 472 billion UGX (US\$179 million; 2014-2015 exchange rates). It appears there was a large decrease in nutrition allocations from year to year, driven primarily by decreasing off-budget funds. Examining this funding mechanism, it seems likely that off-budget allocations for 2014 to 2015 were underestimated, as they were projections and thus did not include any projects planned since the last published document from 2013. From qualitative data, there was no mention of major funding cuts to existing off-budget nutrition projects. Focusing on the more accurate on-budget allocations for assessing change over time, a moderate decrease is found of approximately 8% between the two years, after adjusting for inflation.

Breaking figures down by funding source, GoU funds made up one quarter of all nutrition allocations in 2013 to 2014, and just over one third in 2014 to 2015. This represents roughly 1% of the total GoU budget for 2014 to 2015. Nutrition funding from EDPs, which comprised the majority of total nutrition-related allocations in these two years, was primarily provided off-budget (96%) in 2014 to 2015. Regarding spending, no public records were found of expenditures for on-budget central transfers or off-budget allocations. Expenditure data are available for on-budget national ministry allocations; just over half (55%) of those nutrition-related allocations were spent in 2014 to 2015. This is a decrease in spending from the previous year. Spending rates decreased for both GoU nutrition-related funding (from 69%-52%) and on-budget EDP funding (from 152%-83%).

When compared to the costs projected for the UNAP, MAAIF and MoESTS contributions matched their expected share of support for UNAP activities, while MoH and MoGLSD contributed less than expected and MoLG and MTIC contributed more than expected. In terms of relative financial contributions in the last year of analysis, MoLG had the highest total allocations

for nutrition, with or without central transfers included. The MoLG nutrition activities primarily related to strengthening local service delivery and development. The MAAIF provided the second-largest sector contribution, but also saw the largest decrease in nutrition-related allocation between 2013 to 2014 and 2014 to 2015 (nearly 50%). The MTIC provided the third-highest allocation for nutrition. Although the MoH contributions were not as high as that of these three ministries, the MoH provided the only nutrition-specific allocations within the government.

Central transfers to the districts were by far the largest contributor to total, national on-budget allocations but presented a methodological challenge. In the detailed analysis of allocations in Kisoro and Lira, it was verified that significant portions of total district nutrition-related allocations came from central transfers for the study years. However, it was not possible to validate these transfers nationally for all 112 districts. For off-budget allocations, health-related EDP projects contributed the most nutrition funding by far in both years, with 26% of that total going to nutrition-specific activities. For 2014 to 2015, the health projects represented nearly two thirds of the total, off-budget, nutrition-related allocations. Expenditures by sector showed no particular patterns and there was volatility by sector and year. On-budget spending among EDPs was heavily influenced by a large overspend of one health programme, although overspending

of EDP allocations appeared to be an issue for MWE as well.

Two primary factors appear to be causing the gap in spending across sectors for on-budget funds:

Delayed release of funds: Prior to 2015, tax proposals and allocations were debated well into the start of the fiscal year, delaying the release of funds. Also, because Uganda utilises a cash budget based on tax revenue projections, there is some volatility in the actual funding releases, which destabilises the budget process.

Procurement delays: The bidding process for commodities, capital investments, building projects and engineering works was cited as a major delay and a hindrance to the sector's ability to "absorb" new funds. Bureaucracy was cited as a primary culprit for these delays.

Allocations appear more than sufficient to cover projected costs; they were almost 10 times the projected yearly cost for 2014 to 2015. However, allocations do not always align with the relative priority given to each objective in the costing exercise. On comparing allocations to costs by UNAP objective area, there is some mismatch in relative proportions. This could signal some inefficiency in the allocation of nutrition funds. Objective 2, related to dietary diversity and food security, was allocated nearly triple the percentage projected in the costed

plan. Conversely, for objective 4, related to systems strengthening, allocations were a much smaller proportion of the amount included in the costed plan. Objective 5, related to creating nutrition awareness, received no allocations at all, despite an estimated cost of nearly 2 billion UGX (US\$760 000).

Conclusions

The study results suggest the UNAP has played a role in improving the enabling environment for nutrition via its influence on three key factors: multi-sector coordination, advocacy and adaptation of the plan to local needs. Slow progress in the remaining three factors (unified identity for nutrition, human resources and sustainable structures) could explain why these improvements did not translate to any major increases in new UNAP-related activities within the study period. Further improvements in off-budget financing data are also needed to accurately track the majority of nutrition-related resources. The UNAP is the first major multi-sector nutrition plan the GoU has implemented. The improvements identified by this study do not indicate that scaling up of nutrition interventions has occurred, but they do indicate that a stronger foundation has been laid for scale-up in the future. Other SPRING work on scaling up NNAPs found that it may be unrealistic to see major increases in the implementation of nutrition activities within just five years precisely because of the need to strengthen the underlying enabling environment.

Implementing multi-sector nutrition programmes in Ethiopia and Nepal: stakeholder perspectives

Summary of research¹

Location: *Ethiopia and Nepal*

What we know: Successful implementation of multi-sector nutrition programmes is challenging on numerous levels and there is much to learn about best practice.

What this article adds: A total of 50 semi-structured interviews were conducted with key stakeholders in Ethiopia and Nepal involved in national level discussions on multi-sector nutrition policy design and subsequent programme implementation. The top three issues to be tackled via multi-sector programming by both countries were food insecurity, undernutrition/malnutrition and widespread and/or severe micronutrient deficiencies. More than 60% of respondents identified child stunting as the biggest problem of concern. In Ethiopia, broad engagement of all sectors in developing the National Nutrition Plan and technical/civil society engagement of international NGOs were identified as critical to decision-making and ownership. Nepal's experience was similar, with much greater credit given to the National Planning Commission in reaching out to ministries to develop the MSNP. Both countries saw the need for strong coordination; this was flagged as a greater challenge in Nepal. Composite responses identified a demand for clear leadership that includes a work plan with a defined budget and responsibilities for specific tasks by sectors.

In this article, results are presented from interviews with key stakeholders in Ethiopia and Nepal involved in national level discussions on multi-sector nutrition policy design and subsequent programme implementation. A total of 50 semi-structured interviews (Ethiopia and Nepal combined) provide insights into the way national governments and their development partners approached the creation, formal ratification and implementation of these complex policy instruments aimed at improving nutrition.

Interviewees were identified by government and other partners involved in the development of the multi-sector nutrition plans. Interviews were conducted at national and sub-national levels; this article focuses on national-level results. A total of 24 interviews were conducted at the national level in Ethiopia and 26 in Nepal. The sectors in which interviewees work included, but were not limited to, health, agriculture, education, finance and economic development, gender, child nutrition, youth affairs and social protection. People were

¹ Kennedy E, Fekadu H, Ghosh S, Baral K, Davis D, Sapkota D and Webb P. *Implementing Multisector Nutrition Programs in Ethiopia and Nepal: Challenges and Opportunities from a Stakeholder Perspective*. Food Nutr Bull. 2016 Dec;37(4 suppl): S115-S123.

selected based largely on seniority of position and active engagement in the process leading up to government endorsement and implementation of multi-sector nutrition policies and plans. As such, interviewees included stakeholders from the government, academic institutions, United Nations (UN) agencies, bilateral donors and non-governmental bodies or programmes.

The questions asked were arranged by four domains: (1) The nature of the nutrition problems to be addressed by multi-sector action; (2) Decision-making and ownership of the process; (3) Policy and programme design; and (4) Challenges in implementing multi-sector actions.

Findings

Nature of the nutrition problem

Respondents in both Ethiopia and Nepal identified the same set of three major problems to be tackled via multi-sector programming. In Ethiopia, these were (in order of priority) food insecurity (27%), undernutrition/malnutrition (30%), widespread and/or severe micronutrient deficiencies (20%). In Nepal, the problems identified were malnutrition (45%), micronutrient deficiencies (33%) and food insecurity (22%). When pushed to specify the highest nutrition problem of concern to policy-makers, a majority (>60%) of respondents in both countries identified child stunting.

Decision-making and ownership

Two answers dominated the discussions in Ethiopia. First, 32% of respondents indicated that the involvement of many different parts of government was instrumental in developing and launching the 2013 National Nutrition Plan (NNP); that is, the plan was widely deemed to be legitimate because of broad consultation and engagement of all sectors having a role to play in nutrition. Second, 26% of those interviewed emphasised that the role of international non-governmental organisations (INGOs) was essential, both in terms of securing buy-in from civil society and in ensuring adequate technical input into decision-making. Once again, Nepal's experience was similar, but the magnitude of responses differed. In Nepal, 92% of individuals stated that the National Planning Commission (NPC) was an effective champion for nutrition and reached out to all line ministries to play a role in formulating and implementing the Multi-Sector Nutrition Plan (MSNP). A number of respondents identified the chair of the NPC as a key player in the whole process, using his or her authority and charisma in equal measure to promote a cause in which he or she strongly believed. The second main response in Nepal also related to the role of civil society. Roughly 32% of respondents credited INGOs with having played an important role in supporting the NPC to generate multi-sector buy-in and in rallying civil society around the government's plan.

In Ethiopia, 47% of those interviewed argued that the creation of a formal, multi-institution

technical working group was critical to marshalling necessary evidence and ensuring adherence to a defined timeline. This technical group was created specifically to provide input to the multi-sector plan. Another 29% stressed that a large, government-sponsored workshop in 2010 was important in raising political awareness of the problems associated with stunting and the 1,000-day agenda (promoting a multi-sector focus on preventing stunting from conception to second birthday and to the evidence base relating to possible solutions). The workshop had wide participation of stakeholders, leading to an important constituency of support from across government and its many partners. It also promoted a sense that nutrition was no longer being owned solely by the Ministry of Health (MoH). The process of developing the nutrition plan in 2013 was seen to be more collaborative than the previous iteration in 2008; 39% of respondents pointed to a spirit of common ownership of both the problem and the responsibility for action as the NNP was developed. Another 25% of Ethiopian respondents commented that a high-level government meeting in 2013 included all ministers, resulting in cross-ministry support for the draft nutrition plan.

However, some ownership issues needed to be addressed in the context of plan implementation. First, although enthusiastic about the NNP and the way in which it was developed, roughly a third of Ethiopian respondents said there was a need for more direct involvement of the Ministry of Agriculture (MoA) in fleshing out what a plan on paper needs to look like on the ground. Indeed, 36% of respondents suggested that MoA is inadequately equipped to tackle nutrition and still needs to be convinced that it is the role of agriculture to support nutrition goals. Additionally, 42% of those interviewed still felt that rollout of the plan would have to be led by the MoH and that there was a danger that the earlier, collaborative, multi-sector approach to plan formulation would drop away during implementation.

In Nepal, 44% of respondents stated that the MoH was unlikely to launch multi-sector activities for nutrition without the sustained involvement of other stakeholders, including numerous other parts of government. This was seen to be due to MoH's fairly narrow focus on targeted nutrition-specific actions, such as vitamin supplement distribution and breastfeeding promotion. Another 36% observed that the MSNP was not a top-down initiative; there are critical roles at the district and village levels in discussing priority actions and in making local commitments to nutrition goals. The roles of the many actors involved in implementation vary by agency and job category, creating a challenge in identifying the specific roles of individuals, which can also vary by district and village.

Programme design, implementation and challenges

In Nepal, a majority (56%) flagged the need for

strong coordination at all levels: national, regional, district and village. Without it, they argued, plan implementation would be in jeopardy. An additional 36% stressed that cross-sector coordination was crucial at the national policy-maker level, in part to sustain commitment and to change business practices. Here again, both Ethiopia and Nepal are on a sharp learning curve to clarify the specific responsibilities of sectors and actors in the successful implementation of the multi-sector strategies.

Although the need for coordination was also noted in Ethiopia, only 9% saw this as a main challenge. A further challenge to implementation identified in Nepal (by 36% of respondents) was the need for concrete action strategies outlining the steps for each sector, whereas 52% highlighted the need for clear guidance regarding responsibilities, given the complexity of the MSNP. In essence, respondents were asking for a formulaic, step-by-step approach for translating the multi-sector plans into action. Finally, 31% of respondents expressed the desire to have nutrition as a focus of all agencies. It was clear from the composite of responses that a work plan with a defined budget and responsibilities for specific tasks for individuals/agencies was being sought. The essence of these concerns related to a need for leadership for the NNP, not just multi-stakeholder buy-in.

At the time of writing, the NNPs in both Ethiopia and Nepal are in the early stages of rollout. It is therefore too soon to determine how effectively the plans will be scaled up, their impacts and their sustainability. Respondents were asked about the main challenges going forward. These were identified as: (1) Calls for a clearer mechanism through which all sectors can continue to be part of the process (27%); (2) The need for defined line items for nutrition in the budget for each ministry (27%); and (3) A specific plan for how to implement the multi-sector approach within each agency (17%). Three issues also dominated responses in Nepal: (1) The need for continued involvement of high-level officials (56%) and sustained political engagement; (2) Active, district-level involvement in designing local nutrition actions and overseeing their implementation (40%); and (3) The need for advocacy relating to nutrition (40%). Here again, the focus on high-level officials and need for advocacy reflect the concern that leadership and broad support are both needed to keep nutrition high on the agenda. This plea for continuity in implementation is further complicated by the regular turnover of individuals in senior political posts.

The new nutrition agenda presents some particular challenges in the governance arena in that the multi-sector approach requires some untested approaches. What data in this article highlight is that a "business as usual" model is unlikely to ensure success without bold, new directions to translate plans into action.

Assessing progress in implementing Uganda's Nutrition Action Plan: district-level insights

Summary of research¹

Location: *Uganda*

What we know: There is no specific monitoring and evaluation system to assess progress on implementation of Uganda's Nutrition Action Plan (UNAP).

What this article adds: Two serial cross-sectional panel surveys were conducted in 2011/12 and 2013/14 to determine progress on UNAP-related indicators. Two districts were randomly selected for panel analyses. Household, child and mother/caregiver data were collected. In Kisoro district, prevalence of underweight significantly fell ($P < 0.01$) and dietary diversity significantly increased ($p < 0.01$). Improvements in wasting, iron deficiency anaemia and exclusive breastfeeding were not significant. In Lira district, there was no significant change in measured indicators; while some improved, others deteriorated (e.g. anaemia, exclusive breastfeeding). The authors suggest a strong District Nutrition Coordination Committee (DNCC) role in nutrition planning and implementation, particularly in Kisoro, may explain the results. Empowering DNCCs to use data in planning is critical; incorporating UNAP indicators into existing systems is recommended.

There is no established monitoring and evaluation system that is specific to the implementation of Uganda's Nutrition Action Plan (UNAP). Hence household data collected by USAID's Feed the Future Nutrition Innovation Lab (NIL) was used to inform policy makers on the progress of UNAP-related indicators. Two serial, cross-sectional, panel surveys were conducted by NIL from November 2011 to January 2012 and again in 2013/14 (same time, same households). A district sample size of 600 households was determined as feasible within the existing budget and sufficient to represent the district size. A total of four sub-counties were selected. At the sub-county level, 25% of the parishes were selected using a list from the Uganda Bureau of Statistics (UBOS) and households were randomly selected with probability proportional to the population of the village.

One district was randomly selected from the southwest (Kisoro) and one from the north (Lira). The survey focused on the household, the mother of the household (and/or primary care giver), one index child aged 6 to 23 months, and all other children between the ages of 0 and 59 months. Data domains included household demographics (including education) and socioeconomic factors, as well as the following topics: diet and health status of mothers/primary caregivers; household food security; water, sanitation and hygiene; infant and young child feeding of the index child; and anthropometric and haemoglobin (Hb) measurements of the index child, his/her primary caregiver/mother and all other children in the household who were younger than five years. Quantitative, household-level panel data was analysed for the two study districts. Data on individual maternal and child outcomes were computed for $n=600$ households in each study

district, and SPSS version 22 was used for analysis. The indicators selected for this analysis come from the UNAP table of key target indicators that have also been prioritised by the Government of Uganda. The key variables that included cut-offs were height-for-age, weight-for-age and weight-for-height (stunting, underweight and wasting, respectively). The prevalence of anaemia among mothers and children, as defined by Hb below 12 g/dL in non-pregnant women and 11 g/dL for pregnant women and children, was also calculated.

Findings

A total of 598 households in Kisoro and 603 households in Lira were surveyed in panel one and 544 households in Kisoro and 552 households in Lira were followed up in panel two. The data show that the prevalence of underweight reduced significantly among children younger than five years old in Kisoro district (from 18.6% to 13.5%, $P < 0.01$). There was also a significant increase in children aged 6 to 23 months achieving minimum dietary diversity (from 63.2% to 79.1%, $P < 0.01$). Other child nutrition indicators improved between the two rounds of the panel survey (wasting, iron deficiency – both in women and children – and exclusive breastfeeding) but were not statistically significant. The prevalence of stunting and underweight among children younger than five years old is still above the UNAP targets. To achieve these targets, the prevalence of stunting would need to reduce by another 17 percentage points and the prevalence of underweight an additional 3.5 percentage points.

The data for Lira district indicate that there has been little to no improvement in UNAP targets for children and mothers/caregivers. Child underweight and wasting prevalence did not significantly improve. And while the changes

are positive in most cases, for some indicators the change is negative. For instance, there is an increase in the prevalence of stunting, although this was not statistically significant. However, there was a positive and significant ($P < 0.05$) increase by 4% in food-secure households, based on the Household Dietary Diversity Score, which can reflect the ability of a household to access a variety of foods. The prevalence of exclusive breastfeeding also declined.

Discussion

In Uganda, multi-stakeholder initiatives have proved to be influential, locally owned and more sustainable than single-stakeholder initiatives. However, ascribing a given change to a specific project is difficult. The authors believe that a strong District Nutrition Coordination Committee (DNCC) role in nutrition planning and implementation, particularly in Kisoro, may explain the significant changes in child-related nutrition indicators indicated. The Kisoro DNCC has been very influential in building strong coordination, monitoring and collaboration of a variety of stakeholders in helping district leadership align its nutrition targets with different implementing partners. A strong DNCC can help coordinate the work of multiple actors in the district context and form a bridge to the various district administrative actors that characterise a multi-sector effort. Continually assessing nutrition indicators at the district level can support district decision-makers to achieve UNAP-derived nutrition goals. This can also help districts to align their development partners to district goals by mapping district needs to possible interventions. Using data for monitoring district performance also signals commitment to nutrition goals by district leadership and the DNCC. Monitoring data can be used by a DNCC to persuasively advocate for comprehensive, multi-sector planning at the district level.

National endorsement of nutrition plans does not in itself result in desired outcomes; hence the allocation of scarce resources has to be based on rigorous evidence. Ugandan districts should develop better capacity to acquire and use data relevant to nutrition targets. Empowering DNCCs to use data in planning is critical, since they are the custodians of nutrition planning at district level. This study shows that NIL data can be used to track UNAP indicators until more routine systems are developed. Furthermore, the authors suggest that districts should explore incorporating UNAP target indicators into existing systems, such as District Health Information System (DHIS-2) monitoring data, for district local government planning.

¹ Agaba E, Pomeroy-Stevens A, Ghosh S and Griffiths JK. *Assessing Progress in Implementing Uganda's Nutrition Action Plan: District-Level Insights*. Food and Nutrition Bulletin 2016, Vol. 37(4S) 5142-5150.

Editorial

Operational challenges and uptake in prevention and treatment of malnutrition

G. Gaiffot / ACF Burkina Faso



By Myriam Ait Aissa

Myriam Ait Aissa leads the Action Against Hunger Research and Analyses Department, which overall aim is to produce evidence for better action. Before joining Action Against Hunger, she worked for the Scientific Department of ACTA International, a French applied agricultural research institute, as a research fellow. Her work focused on nutrition and food security research areas.

The second Lancet series on undernutrition was a key milestone in the global call for more robust evidence on nutrition sensitive and specific interventions (Lancet, 2013). Academics, non-governmental organisations, national stakeholders and donors have been increasingly involved in operational research to improve the effectiveness of a set of multi-sectoral interventions for better prevention and/or treatment of undernutrition. Donors and policy-makers regularly reaffirmed their needs for more robust results to orient their policies. This has led to a significant increase in research concerned with humanitarian nutrition programming and policies in crises settings (Blanchet, 2015). While channels to publish or communicate results exist, they offer limited space for sharing learning on process implementation and research uptake by relevant stakeholders. There is no specific space dedicated to the presentation of scientific results on nutrition in humanitarian settings.

To help fill this gap, Action Contre la Faim (ACF) organised in Paris on November 9th 2016 the first annual international conference entitled "Research for nutrition - operational challenges and research uptake in prevention and treatment of undernutrition". ACF's longstanding experience in programming and operational research in humanitarian settings, active research portfolio on malnutrition prevention and treatment, and openness to share challenges as well as successes, meant we were well placed to convene this gathering. The conference had two main objectives: to present a selection of the latest research related to the identification of effective nutrition specific and sensitive interventions in crises contexts; and to provide a space for discussion and debate about nutrition research methodological design and uptake challenges. Almost 200 individuals participated, with 12 international universities, 16 international non-governmental organisations (INGOS) and seven donors represented.

Two panel debates explored operational research challenges and research uptake considerations; proceedings are summarised in this issue of Field Exchange. In both sessions, panellists and plenary participants explored common experiences and themes. Research shared in presentations spoke to key evidence gaps the international community is working on:

- *Impact of cash transfers on undernutrition:* In recent years, a set of robust studies were launched to assess the effects of cash transfers on nutrition. Preliminary results of two randomised controlled trials assessing the effects of cash transfers on wasting in Burkina Faso and Pakistan were presented.
- *Anthropometric assessment of undernutrition:* A significant area of research interest is to identify nutritional vulnerability in children, including but not limited to anthropometric indicators. One study explored identification of wasting, and outcomes amongst infants under 6 months of age in Bangladesh; a second investigated the association of mortality risk with different anthropometric measures.
- *Impact of water, sanitation and hygiene (WASH) activities on undernutrition:* A recent movement, "Wash In Nut", aims to orientate WASH programmes to improve nutrition treatment and prevention outcomes. Evidence of the effects of such strategies on nutrition are still missing. The results of two fascinating randomised controlled trials in Chad were presented.
- *Health service delivery models for acute malnutrition:* There has been recent drive and a number of initiatives to strengthen malnutrition treatment services within health systems, at national and local levels and within communities. Two approaches being researched were presented from Burkina Faso and Mali. Of particular note, research on characterisation of MAM in Burkina Faso should allow for better future treatment strategies.



Pierre Micheletti, Vice-President of ACF France, opens the conference

Maurine IHC

Presented research that is available is summarised in this special section of Field Exchange 54, with headlines and key contacts provided for study results not yet available.

Feedback on the conference was extremely positive, reaffirming the importance and relevance of having dedicated time and space for researchers, practitioners and donors to exchange, discuss and reinforce collaboration on a spectrum of nutrition research with a strong operational focus. ACF is already preparing for the 2017 conference with a view to this becoming an annual event to share, think and innovate around nutrition research in humanitarian settings.

For more information, contact: Myriam Aissa, email: maitaissa@actioncontrelafaim.org

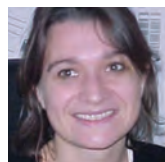
To view video footage of the day, visit: <http://bit.ly/2kDgLnQ>

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Methodological challenges for operational research in the humanitarian context

By Myriam Ait Aissa and Melchior de Roquemaurel



Myriam Ait Aissa leads the Action Against Hunger Research and Analyses Department, which overall aim is to produce evidence for better action. Before

joining Action Against Hunger, she worked for the Scientific Department of ACTA International, a French applied agricultural research institute, as a research fellow. Her work focused on nutrition and food security research areas.



Melchior de Roquemaurel coordinated the Action Against Hunger Research for Nutrition Conference #R4NUT.

This article summarises contributions from Yves Martin-Prével, Institute for Research on Development (IRD); Kate Golden, Concern Worldwide; Timothy Williams from the SPRING project; Victoria Sibson, UCL; Myriam Ait-Aissa, ACF, and plenary discussion during the ACF research conference, Paris, 2016.

Box 1 Research experience of panellists

In 2015 UCL and Concern collaborated to test the effectiveness of an early seasonal randomised controlled trial (RCT) to prevent acute malnutrition in rural Niger. This was one of three studies by the ACF-led consortium REFANI (www.actionagainsthunger.org/refani). Concern also conducted an RCT on a 'community resilience to malnutrition' integrated programme in Chad. Action Against Hunger research department has a multidisciplinary team and currently has a portfolio of six RCTs and seven observational studies recently completed/in progress.

The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project is USAID's flagship, multi-sector nutrition project focused on reducing stunting and anaemia among children in the first 1,000 days. SPRING has conducted operations and implemented research and evaluations in over 10 countries to guide USAID nutrition programmes and contribute to the global evidence base.

The ACF research conference, Paris, 2016 included a panel discussion on the operational challenges of research in humanitarian contexts¹. This article summarises the session. The discussion was moderated by Yves Martin-Prével of the Institute for Research on Development (IRD). Panellists were Kate Golden from Concern, Timothy Williams from the SPRING project, Victoria Sibson from UCL and Myriam Ait-Aissa from Action Against Hunger.

The panellists shared some of the operational challenges they have experienced in a number of recent research studies (see Box 1) and suggested recommendations to improve the overall quality and efficiency of research on nutrition in humanitarian contexts. The studies in question focused on stunting and/or severe acute malnutrition and/or chronic undernutrition, involving experimental and observational designs. Discussions largely centred on experiences with randomised controlled trials (RCTs) in complex settings.

Challenges related to RCTs

RCT methodology is often used for nutrition research in humanitarian contexts and is acknowledged as the 'gold standard' in terms of quality of evidence. Nevertheless, implementing an RCT in a humanitarian crisis context poses many challenges.

Humanitarian programmes operate within strict and often circumscribed and short-term, donor-driven timeframes, whereas scientific research often requires a lengthier period for implementation.

In some contexts, RCTs are not feasible: a well-designed observational study may be better than a poorly implemented RCT. Nevertheless, RCTs are feasible in many humanitarian contexts, even in volatile situations. Critically, researchers must remain mindful of the context and 'expect the unexpected', which typically impacts the length and cost of the research. For example, there may be security issues during randomisation, a pipeline breakdown in nutritional products, or sudden difficulty in population access. An acute conflict or natural disaster may occur on top of a chronic emergency situation. From a research perspective, with the right attitude and preparedness, these are manageable situations and sometimes research consequences may be limited, e.g. an event may impact on the control and intervention groups equally. However, researchers must often engage in lengthy discussions with operations teams concerned with the challenges and risks of implementing research in volatile contexts. In a multi-sector research project, these

conversations are multiplied by the number of sectors involved. Good communication with all parties regarding the project's purpose and objectives can help minimise adverse impacts.

RCTs are important but can be a 'risky' investment for non-governmental organisations (NGOs). From the outset, funding can limit the scope of investigation, such as limiting study arms to a control and one intervention. Where no impact is found in a trial, programme teams may be disheartened by the lack of a clear 'positive' or immediately actionable result. This is particularly true when extraordinary efforts by the programme team have been required to carry out an RCT in challenging contexts. To help address this, a mixed-methods approach, including other elements such as qualitative research, monthly surveillance and process evaluations alongside RCTs, can help ensure practical learning takes place that can be applied even if the headline results are less 'exciting'.

Conducting experimental studies on nutrition requires investment in robust context analysis to document impact pathways or process evaluations, given that nutrition is context-specific, multi-sectorial and related to seasonality. It is important to implement qualitative methodologies, capture seasonal features and take the necessary time for full analysis of all monitored indicators, involving experts from the field, operations and academia.

Funding challenges

Funding timing and flexibility is an ongoing challenge in humanitarian contexts. Programme and research funding sources are typically distinct, with different timeframes and donor requirements. For example, the REFANI project research element was funded by DFID, while programme activities were funded by ECHO. Programme funding was not fully committed until several months after the research funding was secured and study preparations needed to start, including hiring staff. This required both the research and programme partners to plan flexibly and to spend research funds before the trial was 100% guaranteed to happen. Single-source funding that covers both research activities and the intervention(s) would allow better coordination of activities. It would also facilitate study designs that could answer the most relevant questions, rather than just those permitted by the current programme design.

¹ To view a video of this panel debate, visit: <http://bit.ly/2jwmmKx>



Bridget Fenn, ENN, contributing to plenary discussion

Managing the unexpected in research requires donor flexibility. Delays mean extended deadlines are often required. Having a financial envelope for unplanned events is key in the implementation phase, empowering researchers with the flexibility and reactivity needed to respond quickly to change.

Challenges with human resources

Establishing international and national staff teams is not straightforward. Cultural sensitivity is important but is seldom taken into account or given the priority it needs. Capacity development of national staff is often a 'tick-box' exercise without proper investment; agencies and donors need to take it seriously to have an impact. Also, we often fail to appreciate that capacity development is two-way; national staff have a wealth of contextual knowledge that is critical to the implementation of field research.

Experiences from the REFANI Project in Niger and ACF research have found that recruiting national staff with the necessary research skills and experience is challenging. This has led to operational/support staff not being hired as planned and overburdening some existing staff, who became responsible for both research and programme activities.

A number of lessons were learned. First, it is important to be realistic when recruiting research staff where capacity is known to be limited, i.e. appoint international staff or include capacity-building for national staff if time and budget permit. Secondly, recruit adequate numbers of extra personnel to support the implementation of research activities. Thirdly, having a part-time database manager is invaluable, given the need for remote data management in many contexts. Finally, paying casual-hire enumerators bonuses for undertaking all data collection rounds (e.g. baseline, mid-term and endline studies) saves time and money, helps build capacity (e.g. through refresher training) and supports data quality. Staff turnover at field level is common; for REFANI, the

oversight and continuity of an HQ-based research coordinator was a successful element in the research implementation.

Monitoring and indicators

Data collection

During the Concern research studies, many personnel hired as study staff had different expectations about the quality and types of data collection required, given their experiences of working for NGOs rather than academic institutions (which have more rigorous standards for data quality). External parameters such as deteriorating security can constrain access for international research staff, which limits opportunities for researchers to provide support and oversight. For example, during the UCL REFANI study, data collection was undertaken with increasingly limited access for UCL's international research staff due to deteriorating security. To compensate, the team conducted relatively lengthy trainings and hired consultants to provide support as trainers and supervisors. Tablets were used for data collection which posed some practical challenges but at the same time facilitated real-time access to recently collected data at office level in Tahoua, Niamey and London. This proved invaluable for remote data management.

Indicators

Having a comprehensive theory of change regarding nutrition-related issues is key to understanding research findings. To be truly effective, research needs to go beyond simple quantitative frequencies to learn which programme components contribute to improved nutrition outcomes; how and why; and whether the results are generalisable. Rigorous quantitative methods, complemented by qualitative research, are necessary to answer these questions. SPRING has successfully used mixed-methods research in several countries, but finding time and resources to fully analyse data, especially qualitative data, remains challenging.

Project indicators, while important for accountability, have limitations: they may under-emphasise or fail to capture key factors which can have direct impact and could benefit decision-making. Outcome indicators are unique to each country, making cross-country comparisons difficult. At country-level, however, they do allow for tailoring research and evaluation to local needs. This can help build ownership and investment, since the indicators measure what is directly relevant to countries.

Monitoring

Research challenges usually relate to project management, particularly regarding data collection and monitoring. Quality data collection and management can be lacking in the nutrition and health sectors. It is therefore essential to invest in good monitoring and evaluation systems and link this with observational research, resulting in strong data being embedded in programmes. This requires working with operation teams, better use of the field data documented routinely or through audit, and opening discussions around

this. Investing in a good MEAL (Monitoring, Evaluation, Accountability, and Learning) system is key. Action Against Hunger, for example, is working on a tool (NEAP: Nutritional Evaluation Assessment; <http://bit.ly/2ktDtuW>) to improve the assessment of nutritional outcomes in programmes at field level.

Ethical dilemmas

Control groups present an ethical dilemma, particularly in resource-constrained settings. The idea of targeting an intervention based on random selection rather than on need presents operational agencies with a real quandary. In Concern's experience, ways were found to leverage a control or comparison group while maintaining what was considered an acceptable level of accountability to the communities with which they work.

In Chad, the same intervention was provided to the control group, albeit three years later. In Niger, a comparison group – not a full control group – was used, whereby both study arms received the same total amount of cash but over six months versus four months. In Somalia, the control group (an internally displaced persons (IDP) camp close to the IDP camp receiving the cash intervention) was not randomly assigned. It was identified after it had not been prioritised to receive cash following an independent targeting process. The study team had also devised an alternative study design and analysis plan in the event that the control camp did become a target for cash; as it turned out, this did not happen during the three-month study period.

Research data sharing is also a challenge; a fundamental question is whether data should be accessible to all. Open data is transforming research methods and data treatment.

Multi-sector approaches and partnerships and international partnerships

The implementation of longitudinal studies increasingly requires multidisciplinary approaches and the creation of international (and national) spaces to enable the necessary connections and partnerships. Formal structures where NGOs and academics convene are rare. Creating a formal forum for partnerships to develop can be critically important. Even where financial and time constraints limit this type of collaboration, we must try to capitalise more on sharing past experiences and greater investment in multi-sector approaches.

Conclusion

Detailing the operational challenges of conducting research in humanitarian contexts is important. It is also important to invest in longitudinal and multidisciplinary studies to help understand the causes of undernutrition and the means to manage it. These studies should be complemented by in-depth observational studies. Such ambitious projects should be managed by consortiums of NGOs and academics, supported by donors willing to invest and innovate.

How to ensure quality research uptake

By Stephanie Stern



Stephanie Stern leads the Action Against Hunger *LAB* project which aims to reinforce the impact and uptake of knowledge. Before joining Action Against Hunger, she worked for the Strategy & Analysis Department of Save the Children International and was a research fellow at IRIS, the French think tank on international relations and strategic affairs. Her work focused on the transformation of the humanitarian system.

The ACF research conference, Paris, 2016, included a plenary session and panel discussion on how to ensure research uptake for nutrition research in emergencies. This article summarises this session, reflecting contributions from Patrick Kolsleren, Gent University (moderator); Abdoulaye Ka, Undernutrition Unit of the Senegalese Prime Minister's office; Zvia Shwartz, Uptake and Communication Manager for the REFANI project; and Mahaman Tidjani Alou, Abdou Moumouni University of Niamey, and plenary session panel discussion.

Defining research uptake

The discussion began with panellists sharing perspectives on what constitutes research uptake. Zvia Shwartz asserted how important it is to define 'research uptake' and what it entails before any research uptake strategy (RUS) or activities are put in place. The definition agreed upon by all partners for the REFANI project was: "The process whereby research findings are communicated and utilised by a target audience." The definition, and associated strategy and activities, was based on the premise that continuous stakeholder engagement and dissemination of evidence will ultimately lead to research uptake. Tidjani Alou suggested that sharing research findings that have social implications is a means to create appetite that can galvanise "social agitation", as described by the sociologist and philosopher Jürgen Habermas (Calhoun, 1992) around subjects of interest.

Two fundamental questions are: "How do we ensure evidence is utilised by key stakeholders, both in policy and practice?" and: "When should research uptake activities begin?" The panel reflected that an efficient RUS is more than just a sum of activities; it is a continuous process that should take place throughout the entire research project cycle, with various challenges and opportunities. These were examined in more detail during panel exchanges and plenary discussion; a selection of these insights follows.

Uptake challenges

Academic and operational partners may have different interests when collaborating on research together. It is important to find a happy medium between producing robust evidence and publishing findings in journals, and sharing results with stakeholders as quickly as possible. Academics typically seek robust evidence and finalised results before making any statements on findings or engaging in dissemination; this may conflict with operational partners who want to apply the results as quickly as possible and rapidly influence policy and practice.

Researchers tend to move on once a research project is completed, yet this is when the critical dissemination and communication to key stakeholders needs to take place to ensure maximum impact. At the same time, continuing local stakeholder engagement and local dissemination can be difficult once a project has finished.

Keys to success and attention

Improving communication

Continuous engagement with stakeholders is critical. Project information should be shared as it becomes available, e.g. through conferences, meetings with various stakeholders and donors and by hosting specific events. Communication with stakeholders should not wait until results are published, but should start from the very beginning, when research questions are elaborated. But while traditional methods (publications, public and technical debates, conferences, etc) have a role, these routes are arguably limited; they do not create genuine open dialogue. This reflects a missing link between researchers and practitioners that enables coherent dialogue; practitioners and

researchers may speak to each other, but not truly understand or hear what the other is saying. The two communities have different logics and ways of thinking. A third specialism may be needed, comprising individuals capable of understanding the research results and translating them into practical and understandable information. This concept has been described as "social mediation" (Nassirou Bako-Arifari et al, 2000); social mediators support the research during the entire process and once the results are issued, work with the public sector to see where they can make things change.

A critical question, given that knowledge produced can have political and social impact, is: "What is the researchers' responsibility in mediation?" An example was shared from Niger where research on water points enabled resolution of decades-long conflict between two villages regarding land issues. The researchers were involved in mediation with local government. Such mediation by researchers has limitations as he/she may have limited familiarity with the context.



Research uptake panelists (l to r): Patrick Kolsleren, Abdoulaye Ka, Mahaman Tidjani Alou and Zvia Shwartz

Maurine Tric

Researchers publish in a format that is not accessible or is too technical for most stakeholders. Eighty-two per cent of articles published in the humanities are not even cited once. Of those articles that are cited, only 20 per cent have actually been read. Half of academic papers are never read by anyone other than their authors, peer reviewers, and journal editors (Lattier, 2016). The fora where research information is exchanged and discussed are not frequented by practitioner stakeholders and decision makers. Research information should be presented to stakeholders in a format that is short and gives a clear conclusion so that the information can be quickly translated into a decision. Important efforts are needed to improve communication between stakeholders and researchers and identify new ways to communicate coherently and succinctly.

Fulfilling users' expectations

Practitioners and agencies need evidence. The UN Food and Agricultural Organization (FAO), for example, is a "knowledge organisation" that works to create linkages between research and politics and between research results and policy and programming. The FAO works with research institutes on subjects defined by FAO; the primary goal is not scientific publication but to have a guidance note with a strong operational focus to help programmers and policy makers. More broadly, it was observed that there is often a discrepancy between expectations of the researcher and the final user. Scale-up is also an important issue; final users need guidance on how and whether results are scalable or applicable to other contexts.

Upstreaming research in strategic planning

There are important lessons to learn from upstreaming research in strategic planning at country level. In Senegal in early 2000, for example, evaluations were used to investigate the effectiveness of the national nutrition programme, which proved extremely useful to prove the impact of the approach and strategy. When the government decided to adopt a multi-sector approach to fight undernutrition, research played a key role in defining what needed to be implemented, supporting strategic and operational guidance. The multi-factor and multi-sector character of combatting malnutrition makes the challenge of ensuring coherence between the needs of researchers and operational actors even more interesting. At country level, we are typically tasked with setting up multi-actor, multi-service platforms at household, community and government levels. Research challenges play out at all tiers.

In Senegal, research is well positioned in nutrition policy as a transversal element to support the definition and effective implementation of strategies aligned with the needs of the country. It fuels the choices of different strategies in the planning stage, supports implementation by providing guidance on how to ensure the effectiveness of interventions and is fundamental in providing information to the M&E system to explain successes and failures.

Research still faces multiple challenges, including: the lack of French language publication/translation of research that hinders uptake in Francophone countries; how to adapt to different national and local contexts; the need to have dialogue with decision-makers and operational staff (practitioners); and the critical mass of skills that must be created to generate evidenced actions.

Bridging the gap between researchers and practitioners

A more holistic approach to knowledge management is needed, involving more than sporadic annual discussions and more open, transparent and continuous dialogue. We need to broaden our horizons and set up shared knowledge platforms, breaking down the divides that currently exist between researchers, practitioners and decision makers. This is how the Senegalese government is approaching its nutrition policy, gathering all the concerned stakeholders round the table – including academics and scientists engaged in all the different sectors impacting nutrition – and monitoring and evaluating the impact of this holistic approach.

Action-driven research

There are three dimensions to research uptake. There is the *needs* aspect that is the problem at hand; the *demand* side expressed as a need for information to support decision making; and the *offer*, i.e. what researchers produce. In an ideal situation, these three dimensions overlap, but often in practice they do not. Researchers offer research results within the perspective of their academic freedom. When this is *offer* only, the research may be innovative but is still perceived by stakeholders as useless, because it does not help them make decisions. From the *demand* side, stakeholders have difficulties expressing

their need for information in a format to which researchers can respond. Given that the research agenda is driven by external donors, the demand side cannot be met if the need does not fit donor priorities. Local funding for research is often lacking, so that local demand has little or no traction. Research to answer a particular question might not be innovative enough or too implementation-oriented, making chances of publication slim; academics may be less interested in pursuing such research from the outset.

Uptake of research results can be enhanced by identifying the questions stakeholders have from the beginning and responding with research to answer these questions specifically. Research uptake should be considered as a participatory process, engaging all the stakeholders at different levels and moments of the research cycle. Its efficiency lies in the combination of various elements: responding to a question which interests donors, stakeholders (including beneficiaries) and researchers and ensuring all the concerned actors are adequately informed and engaged in the research process, the dissemination of its results and their application to improved policies and practices.

To view a video of this panel debate, visit <http://bit.ly/2kAcisq>

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Patrick Kolsteren, contributing to plenary discussions

Maurine Inc

A cluster RCT to measure the effectiveness of cash-based interventions on nutrition status in Pakistan

Summary of conference abstractⁱ

By Bridget Fenn



Bridget Fenn is an epidemiologist with a background in nutrition. She is currently a consultant for the Emergency

Nutrition Network (ENN) and is Principle Investigator on the Research in Food Assistance for Nutrition Impact (REFANI) Pakistan study involving seasonal cash transfers (cash and vouchers) and their impact on childhood nutritional status in humanitarian settings.

Video footage of the conference presentation is available at <http://bit.ly/2kAe7e5>

Location: Pakistan

What we know: Evidence of the impact of cash-based interventions on nutrition outcomes is limited.

What this article adds: A four-arm (standard cash (SC), double cash (DC), fresh food voucher (FFV), control) parallel, longitudinal, cluster randomised controlled trial was implemented over six months by Action Against Hunger and ENN. Primary outcomes were weight-for-height z scores (WHZ) <-2 and mean WHZ in children under five years old. Preliminary results found a significant decrease in risk of being wasted (WHZ <-2) with DC only and significant improvements in mean WHZ for DC and FFV. All three interventions saw a significant decrease in both stunting and mean height for age. There was a significant decrease in mean haemoglobin (Hb) concentration for children and mothers in the FFV and for mothers only in the SC arm. A pathway causal analysis is underway that will greatly aid interpretation, with results available mid-2017.

Background

The Research into Food Assistance for Nutrition Impact (REFANI) consortium comprises two operational partners; Action Against Hunger (lead agency) and Concern Worldwide, and two academic/research partners; ENN and University College London (UCL). REFANI is a three-year research project funded by UK Aid and co-financed through funding from the European Commission (EU & ECHO). The overarching aim of REFANI is to increase the evidence base of cash-based interventions (CBIs) on nutrition outcomes in humanitarian settings by addressing a number of evidence gaps. The use of CBIs among humanitarian agencies to prevent wasting in children is increasing, but questions remain on how best to incorporate CBIs into emergency programmes to maximise their success in terms of improved nutrition outcomes.

The REFANI Pakistan study is a collaboration between Action Against Hunger and ENN, set in Dadu district, Sindh province. Dadu district is largely agrarian, dependent on crop production, livestock keeping and agriculture labour. The majority of the population are highly vulnerable to shocks, especially the poorest households, and there is a lack of alternative income sources, further constrained by lack of opportunities. Dadu district experiences frequent flooding, droughts and high temperatures (above 45°C).

Methods

This study involved a four-arm, parallel, longitudinal, cluster randomised controlled trial (cCRT) (registered trial number *ISRCTN107615320*). The protocol has been published¹. Three CBIs were implemented: two unconditional cash transfers (a 'standard cash' (SC) amount of 1,500 Pakistan Rupees (PKR) and a 'double' cash (DC) amount of 3,000 PKR) and one fresh food voucher (FFV) with a value of 1,500 PKR, which could be exchanged for specified fresh foods (fruits, vegetables and meat). A fourth arm acted as the control group and received no additional intervention beyond the basic activities implemented by Action Against Hunger that were provided to all groups. The SC was set to equal the amount disbursed by Pakistan's national safety net programme, the Benazir Income Support Programme (BISP). The cash components were disbursed on a monthly basis either by mobile banks that travelled to a central location for some of the participating villages or through central banks that served a number of villages. The FFVs were disbursed to participating

households at village level. All three interventions were delivered with verbal messages that children should benefit from the transfers.

The interventions were implemented over six consecutive months (July to December 2015) and targeted to mothers from poor/very poor households with a child 6-48 aged months at baseline. The implementation and the use of the CBIs were monitored both quantitatively and qualitatively through monthly questionnaires or quarterly focus group discussions and key informant interviews.

The main research question assessed the effectiveness of different CBIs at reducing the risk of undernutrition during the lean season. The primary outcomes were weight-for-height z scores (WHZ) <-2 and mean WHZ in children under five years old. The study also encompassed a mixed-methods process evaluation to help interpret the results and a costs and cost-effectiveness analysis (results not presented here).

Results

The results presented here are a summary of the short-term impact of CBIs on nutrition outcomes. The full analysis of both short and medium-term impacts is forthcoming. The group with the higher amount of cash (DC) saw a significant decrease in risk of being wasted (WHZ <-2) compared to the control group. There were no significant differences in risk of being wasted for either SC or FFV arms. Both the DC and FFV arms saw significant improvements in mean WHZ compared to the control arm. All three interventions saw a significant decrease in both stunting (height-for-age z-score (HAZ) <-2 and <-3) and mean HAZ compared to the control group. In the FFV arm, there was a significant decrease in mean haemoglobin (Hb) concentration for children and mothers and for mothers only in the SC arm.

Lessons learned

The results have identified a number of questions that still need to be answered and for now require careful interpretation. In terms of risk of being wasted, we need a better understanding of why children in the DC arm were significantly less wasted. This will be attempted through a pathway analysis whereby different pathways in the causal framework will be quantified. It was

ⁱ Presented at the ACF research conference, November 9th, 2016.

¹ <http://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-015-2380-3>

not possible to establish the minimum level of cash required to have a significant effect; we can only say that this threshold falls somewhere between the amounts allocated in the SC and the DC interventions.

Regarding mean WHZ, it appears that children in the FFV arm were getting fatter but not taller, especially if interpreted with the lack of improvement in being wasted. As well as this, the Hb levels of children and mothers in the FFV arm were significantly lower compared to the control group. We had hypothesised that the FFV would impact growth and micronutrient status through increasing dietary diversity. However, while all three arms showed a significant improvement in mother and child dietary diversity, this improvement was lowest in the FFV arm (highest in the DC arm). These results suggest that something unplanned was occurring in the FFV arm. It is pos-

sible that the vouchers themselves were too restricted, being dependent on what vendors stocked (such as chicken being the only available meat). There were also anecdotal reports regarding vendors overcharging for food items redeemed against the vouchers as a way to cover their own administration fees in recovering the voucher costs. In this respect, the actual transfer amount given may have been lower. Another question that needs to be addressed was the lack of improvement in Hb status in light of the improvements in ponderal growth and prevalence of being wasted as seen in the DC arm. The explanation for this will also be attempted through a pathway analysis. The study setting presented a number of difficulties affecting data collection. The baseline survey took longer than expected, since recruitment of female enumerators was difficult and the data collection coincided with Ramadan and reduced

working hours. Added to this, temperatures reached 52°C, which not only affected research team working ability but also had an effect on the haemocytes (this was managed).

Conclusion

The results illustrate the impacts of different CBIs on nutrition status. However, the theory of change regarding 'how' CBIs may influence nutrition outcomes in children is complex. In the RE-FANI Pakistan study, we show that it is not a straightforward task to simply interpret impact results as working or not; understanding the pathways and processes through which CBIs are implemented is essential to understand how best to implement them. Such analyses will be completed mid-2017.

For more information, contact: Bridget Fenn, email: bridget@enonline.net

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

Summary of conference abstractⁱ

By M Munirul Islam, Yasir Arafat, Nicki Connell, Golam Mothabbir, Marie McGrath, James Berkley, Tahmeed Ahmed, and Marko Kerac

M Munirul Islam and Tahmeed Ahmed both work at the Nutrition and Clinical Services Division, International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b). Yasir Arafat and Golam Mothabbir work in the Health Nutrition and HIV/AIDS Sector, Save the Children, Bangladesh. Nicki Connell works in the Department of Global Health, Save the Children USA. Marie McGrath works with the Emergency Nutrition Network, UK. James Berkley is based with the KEMRI/Wellcome Trust Research Programme, Kenya. Marko Kerac is based at the Department of Population Health, London School of Hygiene & Tropical Medicine,

Video footage of the conference presentation is available at: <http://bit.ly/2kA6B33>

Location: *Bangladesh*

What we know: The burden of acute malnutrition in infants < 6 months varies by country. Community-based case management for uncomplicated cases is lacking.

What this article adds: A recent study investigated the prevalence of acute malnutrition in infants <6m in semi-urban Bangladesh (two seasons) and undertook a prospective cohort study to describe current outcomes of identified cases at six months (180 days) of age. Prevalence of acute malnutrition was low post-harvest but increased pre-harvest; from 0.4% to 5.9% for severe acute malnutrition (SAM) and 2.8% to 10.1% for global acute malnutrition. At age six months, 24% of identified SAM cases (by eight weeks of age) and referred for available treatment (inpatient), remained severely malnourished. A range of infant and maternal risk factors for infant SAM were identified, involving breastfeeding status, the nutrition and mental health of the mother, infectious disease and water/sanitation/hygiene. A package of care is warranted in this age group.

Current WHO guidelines on severe acute malnutrition (SAM) management recommend outpatient management of uncomplicated acute malnutrition in infants under six months of age (infants <6m), in line with the now-established treatment approach for older children (WHO, 2013). However, there is a lack of practical guidance on how to identify those infants <6m at risk

and how to manage them. Current WHO case definition for SAM in infants <6m is weight-for-length of less than -3 Z-score (WLZ); visible severe wasting; and/or bilateral pitting oedema.

To inform the development of assessment tools and treatment approaches for SAM in infants <6m, a

ⁱ Presented at the ACF research conference, November 9th, 2016.

study was conducted in semi-urban Bangladesh in 2015/2016 with the following objectives:

1. To estimate the prevalence of infants <6m with acute malnutrition in the community;
2. To develop an assessment tool/case definition checklist for infants <6m with acute malnutrition; and
3. To describe current outcomes following infant <6m with acute malnutrition.

The study involved two prevalence surveys (in distinct seasons) and a prospective cohort study of three infant groups (77 in each group), followed from 4-8 weeks to 180 days post-partum. The groups comprised:

Standard SAM:

WLZ <-3 and/or bipedal oedema;

Normal:

WLZ ≥-2 to <+2 z-scores, no oedema;

Expanded SAM:

MUAC <115mm but WLZ ≥-2, no oedema.

MUAC case definition does not exist for infants <6m; data were collected for research purposes only. Mother/caregiver interviews at enrolment assessed potential risk factors. Infants with 'Standard SAM' were referred to existing services for treatment (inpatient care) according to existing protocols. The primary outcome was nutritional status at age completion of 180 days.

Preliminary results

Prevalence survey

The prevalence of GAM and SAM were low in the post-harvest period but increased pre-harvest; from 0.4% to 5.9% for SAM and 2.8% to 10.1% for GAM. Severe underweight (weight for age < -3 Z-score (WAZ)) slightly increased (severe: 5% to 6.1% and severe/moderate combined, from 14.4% and 16.3%).

Cohort study

At enrolment, 'Standard SAM' and 'Expanded SAM' were younger than 'Normal' infants (5.1, 5.5, 6.5 weeks respectively, p<0.001). A selection of characteristics that differed between these

Table 1 Differentiating characteristics between cohorts

	Standard SAM	Normal	Expanded SAM	
Non-exclusive breastfeeding	34%	13%	23%	p=0.01
Duration of exclusive breastfeeding	3.9 weeks	5.7 weeks	4.5 weeks	p<0.001
Dissatisfaction with breastfeeding	22%	10%	7%	p<0.001
Mothers educated beyond school year five	56%	71%	77%	p<0.023
Maternal mental health/distress score (max score is 20)*	8.4	6.8	7.5	p<0.008
Maternal mid-upper-arm circumference	233mm	246mm	241mm	p<0.012
Infant illness episodes requiring hospitalisation	21%	6%	9%	p<0.001
Household income/month	\$89	\$114	\$114	p=0.007

* WHO Self Reporting Questionnaire 20. World Health Organization (WHO). A User's Guide to the Self Reporting Questionnaire. WHO/MNH/PSF/94.8. http://apps.who.int/iris/bitstream/10665/61113/1/WHO_MNH_PSF_94.8.pdf

groups at enrolment is shown in Table 1. Type of toilet was significantly different among the groups; Standard SAM had more people with a pit latrine vs. a flushing toilet compared to the other two groups. Handwashing and source of water were not significantly different among the groups. Duration of breastfeeding was not significantly different among the groups.

At age six months, ~24% of 'Standard SAM', 1% of the 'Normal', and 5% of 'expanded SAM' infants had SAM (p≤0.001). Three infants with 'Standard SAM' died; compared to none in the 'Normal' group and one in the 'Expanded SAM' group. In the Standard and Expanded SAM groups, significantly fewer infants were still being breastfed, more infants were fed anything other than breastmilk at enrolment and endline, and more infants were given animal milk at an earlier age, compared to the Normal group. Duration of exclusive breastfeeding was also shorter in both groups, mothers breastfed less often, had higher mental health/distress score and were significantly less satisfied when asked how breastfeed-

ing was going. Maternal Body Mass Index (BMI) and MUAC were lower in the Standard SAM group. More infants in the Standard SAM group had at least one episode of illness that required hospitalisation at enrolment; this proportion (21%) had increased to 40% by endline.

Challenges to implementing the research included:

- Access to villages in the rainy season; surveyors had to cross many bodies of water with equipment including motorbikes.
- Randomly selected villages were geographically spread out, so travel time was high.
- Measuring anthropometry in infants <6m is difficult, especially length.
- The number of questions in the questionnaire was a challenge as many were necessary to ensure comprehensiveness.

Discussion and conclusions

A range of maternal, infant and environmental risk factors are associated with SAM among infants <6m. Successful future treatments should focus on a package of care rather than single interventions that include breastfeeding support; the nutrition, physical and mental health of mothers; infectious disease management; and water/sanitation/hygiene conditions. Over one quarter of the infants identified with SAM at the outset remained severely malnourished at six months of age; this suggests inadequate provision and/or access to treatment of SAM and a risky environment. It is necessary to distinguish these vulnerable infants from those who had recovered by six months; indicators in addition to anthropometry are probably necessary.

For more information, contact: Nicki Connell, email: nconnell@savechildren.org

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MUAC case definition does not exist for infants <6m; data were collected for research purposes only

Water, livestock, and malnutrition findings from an impact assessment of Community Resilience to Acute Malnutrition programme in Chad

Summary of conference abstractⁱ

By Anastasia Marshak, Helen Young and Anne Radday



Anastasia Marshak is a Researcher at the Feinstein International Center, Friedman School of Nutrition Science and Policy, Tufts University. Helen Young is Research Director at the Feinstein International Centre, Friedman School of Nutrition Science and Policy, Tufts University. Anne Radday is Research Programme Manager at the Feinstein International Center, Friedman School of Nutrition Science and Policy, Tufts University.

Video footage of the conference presentation is available at: <http://bit.ly/2jYbWCS>

Location: Chad

What we know: Evidence and mechanisms of impact are limited regarding programmes that combine nutrition with other interventions, such as health, water, sanitation and hygiene (WASH) and food security.

What this article adds: A randomised control trial impact evaluation was conducted of the Community Resilience to Acute Malnutrition (CRAM) project in Chad, a three-year, integrated, multi-sector programme. The findings indicate significant programme impact, particularly in relation to acute malnutrition, although prevalence of wasting (and stunting) remained high.

At endline, children in CRAM settlements were significantly better off, including lower prevalence of wasting, stunting and illness. WASH promotion activities also showed a significant positive impact of CRAM and were correlated to child nutrition outcomes. Differences in child outcomes between settled and former pastoralist communities may be explained by seasonal factors and livestock management practices affecting water contamination by cattle. This suggests access to clean water is not sufficient; hygiene of the supply chain also appears critical.

The Dar Sila region of eastern Chad experiences highly variable rainfall, seasonal food insecurity and high prevalence of acute malnutrition. In 2012, Concern Worldwide put in place an integrated programme that combines nutrition, health, water, sanitation and hygiene (WASH) and food, income and markets (FIM) provision in Dar Sila called Community Resilience to Acute Malnutrition (CRAM). The programme was designed to reduce child acute malnutrition in the face of seasonal shocks.

Concern collaborated with the Feinstein International Center, Friedman School of Nutrition Science and Policy at Tufts University to carry out a randomised control trial impact evaluation to better understand the level of programme impact and the mechanisms behind it. Three surveys took place in November and December of 2012, 2014 and 2015 in 69 settlements encompassed by the Concern programme area. This article summarises the impact of the CRAM programme and highlights household and community characteristics correlated with acute malnutrition in Dar Sila, Chad.

Method

The study covered 1,400 households, spread evenly between 69 settlements. The survey collected information on household demographics, socio-economic characteristics, food insecurity, access to natural resources, and child nutrition and morbidity. In addition, a

qualitative investigation was carried out in 2013, 2015, and 2016 using focus groups and key informant interviews.

All the data were adjusted for the sampling design and included population weights. To establish programme impact, logit and ordinary least squares (OLS) analysis regression models were used for binary and continuous outcome variables respectively. To take advantage of the panel nature of the dataset, a random and fixed effects model was run using the weight-for-height z-score (WHZ) of the child in the household with the lowest score as the outcome variable, simply referred to as 'nutritional status'.

Results

At the endline, children in the CRAM settlements performed significantly better than the non-intervention group on a host of key nutrition and health indicators. They had lower prevalence of wasting; higher WHZ; lower prevalence of chronic malnutrition (stunting); higher height-for-age z-scores (HAZ); and lower prevalence of illness (Table 1). Even when controlling for child, household and settlement characteristics using a random and fixed ef-

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	Control	Treatment	Significance
WHZ	-1.13 (-1.29 to -0.98)	-0.85 (-1.02 to -0.66)	p < 0.05
Wasting (WHZ < -2)	0.21 (0.17 to 0.24)	0.15 (0.10 to 0.19)	p < 0.05
HAZ	-1.27 (-1.44 to -1.09)	-1.07 (-1.23 to -0.92)	p < 0.1
Stunting (HAZ < -2)	0.37 (0.33 to 0.40)	0.30 (0.26-0.35)	p < 0.05
Child sick in the past two weeks	0.37 (0.31 to 0.43)	0.28 (0.23 to 0.34)	p < 0.05



Anastasia Marshak

fects regression model, both being in the intervention group ($p < 0.1$) and moving from not receiving CRAM to receiving CRAM ($p < 0.1$) was significantly correlated to better household child nutritional status (i.e. minimum household WHZ).

The WASH promotion activities also showed a significant positive impact of CRAM and were correlated to child nutrition outcomes, specifically in relation to the following variables: greater utilisation of boreholes; greater reports of regularly washing the transport and storage container with soap; and greater knowledge around the two main times for handwashing (Table 2). However, the proportion of respondent's correctly practicing handwashing significantly decreased ($p < 0.05$) in the intervention settlements only, suggesting increased knowledge did not translate into changes in behaviour. A link was observed between water consumption and CRAM in relation to exclusive breastfeeding. Respondents in the intervention settlement were significantly more likely to exclusively breastfeed at the endline, primarily driven by a reduction in giving water to children under the age of six months (78% of mothers reported giving water in the non-intervention settlements versus 54% in the intervention settlements ($p < .05$)). In the regression analysis, utilisation of a borehole (as opposed to an open water source) was significantly ($p < 0.01$) and negatively correlated with child acute malnutrition. However, the same relationship was not observed in the non-intervention settlements, indicating a potential role for hygiene practices along the water chain in reducing contamination of water.

A possible source of water contamination is the concentration of cattle in a village. In the regression analysis, while individual livestock ownership correlated with better child nutrition outcomes ($p < 0.1$), as the concentration of cattle in a village increases, so do rates of acute malnutrition ($p < 0.05$). However, children who lived in former pastoralist settlements had consistently better nutritional status ($p < 0.05$), even though households in these settlements were significantly more likely to own more cattle ($p < 0.01$).

Table 2 WASH indicators at endline (% with confidence intervals in parentheses)

	Control	Treatment	Significance
Borehole utilisation	46% (33 to 60%)	79% (66 to 91%)	$p < 0.01$
Transport container cleaned once a week with soap, closed, and "looks" clean	12% (9 to 16%)	21% (15 to 26%)	$p < 0.01$
Know the two times for handwashing	57% (50 to 64%)	67% (60 to 74%)	$p < 0.05$

Differences in livestock management and seasonal location of livestock, uncovered in the qualitative research, may be driving this observed difference in child nutrition outcomes. Households in the former pastoralist damre communities, specialised in cattle production, reported migrating farther with their herds during the dry season to areas with permanent rivers. Village households brought their cattle back to the village at the height of the dry season and utilised nearby water sources, including the borehole.

Discussion

These findings indicate significant programme impact, particularly in relation to acute malnutrition. One cautionary note is that, for the duration of the programme, the prevalence of global acute malnutrition remained around 15% or above, while stunting prevalence was between 30 and 45%. There is no statistical evidence that CRAM reduced the rate of malnutrition in the intervention settlements; rather, unlike in the non-intervention settlements, malnutrition rates did not increase over time. These continuing high rates of acute malnutrition, and the increases seen in the non-intervention settlements, are causes for concern and indicative of the extreme vulnerability of these communities as they emerge from more than a decade of protracted crises. There is, however, greater resilience in CRAM settlements as a result of the programme.

The data also offer clues regarding the mechanisms related to impact and how impact could be increased. Using a borehole without proper training on the water chain does not in itself sig-

nificantly decrease rates of malnutrition. Routine water testing found that, while contamination levels (coliforms) of borehole water at the point of collection were low to non-existent, they increased at certain points along the water chain (from borehole to transport container to storage container). This finding suggests that the positive impact of CRAM on malnutrition may be via the WASH activities that are focused on reducing the risk of contamination of potable water further along the water chain. These activities promote good hygiene in relation to water containers.

A possible source of water contamination is the concentration of cattle in a village. The association between village cattle density and child nutritional status is a possible explanation of contamination. Previous literature had identified several pathogens associated with diarrhoea and death among infants. One of those pathogens – cryptosporidium parvum – is water-borne, is passed from cattle to humans, and has been to shown to cause rather than simply exacerbate malnutrition.

These findings indicate that CRAM had a significant programme impact on both acute and chronic malnutrition. The evaluation also explored why the CRAM programme might have worked and how it could be improved. Access to clean water appears to play an important although not sufficient role; hygiene practices along the water chain might also be critical in preventing contamination along the water chain.

For more information, contact: Anastasia Marshak. anastasia.marshak@tufts.edu

Inflammation and moderate acute malnutrition in children: a cross-sectional study in Burkina Faso

Summary of conference abstract¹

By Bernardette Cichon



A Treatfood project research site, Province du Passoré, Burkina Faso

Bernardette Cichon is undertaking her PhD at the University of Copenhagen. She has an MSc in Public Health Nutrition from the London School of Hygiene and Tropical Medicine and more than eight years experience working with nutrition in humanitarian contexts.

The treatFOOD project¹ is a collaboration between ALIMA, MSF-Denmark and the University of . It was funded by DANIDA, MSF-Denmark, MSF-Norway, WFP, USAID, ECHO and Arvid Nilsson's Foundation.

Video footage of the conference presentation is available at: <http://bit.ly/2jYbWCS>

Location: Burkina Faso

What we know: The role of morbidity in moderate acute malnutrition (MAM) is not well understood.

What this article adds: An observational study in Burkina Faso, using baseline data from a randomised controlled trial, described morbidity and inflammation in children with MAM. Almost 90% of children with MAM in this setting had an infection and/or inflammation. Maternal history reported a 38% infection rate in the previous two weeks; 71.8% were ill on the day of visit. Most prevalent diagnosed illnesses were malaria (40.2%), lower respiratory tract infections (23.2%), and upper respiratory tract infections (14.6%); fever was common. A total of 10.7% and 46.5% of asymptomatic children had elevated acute phase proteins (CRP and AGP, respectively), suggesting sub-clinical infection. This was largely unexplained by maternal reports and clinical examination. More emphasis on identification and treatment of infections as part of MAM treatment and investigation into how this affects nutritional status and recovery is needed.

Background

Morbidity plays an important role in the development of and recovery from malnutrition. Morbidity in children with moderate acute malnutrition (MAM) has not been described in detail and it is unclear how morbidity compares to serum levels of acute phase proteins (APPs) which indicate systemic inflammation that can impede response to therapeutic nutritional interventions. The objective of this study was to describe morbidity and inflammation in children with MAM and to assess to what extent maternally reported and clinically diagnosed morbidity explains the variation in APPs.

Methods

The data for this observational study were baseline data collected as part the treatFOOD trial, a randomised controlled trial testing effectiveness of food supplements for treatment of MAM, carried out in the Passoré Province, Northern Region, Burkina Faso. Children aged 6-23 months with MAM, resident in the catchment area and whose parents/guardians consented to participate, were included. Recruitment took place from September 2013 until August 2014.

Socio-demographic, anthropometric and morbidity data were collected by trained staff. Morbidity data collection included a patient history based on 14-day maternal recall of symptoms and a physical examination carried out by study nurses. Venous blood (2.5 ml) collected from the arm was used for diagnosis of malaria, using a rapid diagnostic test (RDT), and to measure serum concentrations of C-reactive protein (CRP) and α 1-acid glycoprotein (AGP). Fever was defined as an axillary temperature > 37.5 °C. Upper and lower respiratory tract infections were diagnosed by experienced nurses based on an adapted version of the Integrated Management of Childhood Illnesses (IMCI) guidelines. Diarrhoea was defined as three or more loose, watery stools per day based on information provided by the mother. The thresholds used for defining el-

evated APP levels were CRP >10 mg/l and AGP >1 g/l. Multivariate ANCOVA models were used to explore the associations between morbidity and CRP as well as AGP. These models were also used to determine to what extent morbidity explains variation in APPs.

Results

A total of 1,609 children were enrolled in the study. Over half (54.6%) of participants were female. Prevalence of stunting (height-for-age <-2 z score) was 37.7%. The mean (SD) age was 12.3 (4.8) months.

Mothers reported illnesses in the two-week period prior to admission in 38% of children. Furthermore, 71.8% of children were ill on the day of the visit according to the physical examination by the study nurse. The most prevalent illnesses diagnosed by the nurse were malaria based on positive RDT (40.2%), lower respiratory tract infections (23.2%) and upper respiratory tract infections (14.6%). Fever was also common (17.7%). Almost a quarter (24.2%) and two thirds (66.4%) of children had serum CRP >10 mg/l and serum AGP >1 g/l, respectively.

Positive malaria RDTs were more common among children admitted based on mid-upper-arm circumference (MUAC) only than children admitted based on weight-for-height z score (WHZ) only, after adjustment for age and sex (38% vs 26%, $p<0.001$). More children had lower respiratory tract infection if they were admitted based on WHZ only compared to MUAC only, after adjustment for age and sex (29% vs 21%, $p=0.006$). There were no associations between other symp-

¹ See www.treatfood.org

¹ Presented at the ACF research conference, November 9, 2016. Published research: B Cichon, F Fabiansen, CW Yaméogo, MJH Rytter, C Ritz, A Briend, VB Christensen, KF Michaelsen, R Oummani, S Filteau, P Ashorn, S Sheperd and H Friis. Children with moderate acute malnutrition have inflammation not explained by maternal reports of illness and clinical symptoms: a cross-sectional study in Burkina Faso. BMC Nutr. 2016;2:10.1186/s40795-016-0096-0.

toms, illnesses and APP levels and admission categories. A total of 10.7% (n=36) and 46.5% (n=157) of asymptomatic children had a CRP >10 mg/l and AGP >1 g/l, respectively. Only 19% of children had normal CRP and 12% had normal AGP in the absence of symptoms.

History of fever as well as nurse-documented fever, malaria, respiratory tract infections and skin infections were associated with higher levels of both APPs. History of cough and diarrhoea at the inclusion visit was associated with higher AGP only. Overall, morbidity data only explained a small amount of the variation in APP levels (adjusted R2 below 0.2 in all tested models).

Lessons learned

This cross-sectional study has shown that almost 90% of children with MAM in this setting had an infection and/or inflammation. MAM treatment

protocols usually only provide for supplementary food and routine medication such as deworming, vitamin A and iron and folic acid supplements. These results indicate a possible need for more emphasis on identification and treatment of infections as part of MAM treatment.

Furthermore, elevated APP levels in children without identified symptoms are not uncommon and morbidity data explained only a small proportion of the variation, as demonstrated by the adjusted R2 which was <0.2 in all models, both indicating a presence of sub-clinical inflammation. It is unclear what causes this sub-clinical inflammation and whether it affects nutritional status and response to treatment. Possible explanations for the sub-clinical inflammation cited by the authors include missed infections; the fact that APPs can rise during the incubation phase of

a disease before clinical symptoms become apparent or remain elevated during convalescence; and the presence of other conditions such as environmental enteric dysfunction (EED); recent vaccinations; cooking with biomass fuels; and exposure to toxins that may elicit an acute-phase response.

Conclusion

Morbidity among children with MAM in this setting is common but maternal reports and clinical examination explained only a small proportion of the variation in APPs, indicating a presence of sub-clinical inflammation. Further research is needed into the causes of this sub-clinical inflammation, as it could affect nutritional status and success of MAM treatment.

For more information, contact: Bernadette Chichon, email: cichon_b@yahoo.com

Upcoming research shared at ACF research conference

At the ACF research conference, November 6th, 2016, experiences were shared from a number of studies where final results will be made available in 2017. A snapshot of what to expect, video footage of the conference presentations and contacts for the studies, are included below.

The PROMIS project: integrating the prevention of child undernutrition into community-based management of acute malnutrition programmes in Senegal, Mali and Burkina Faso

Innovative Approaches for the Prevention of Undernutrition (PROMIS) is a three-year (2014-16) project funded by Global Affairs Canada that seeks to prevent and improve the treatment coverage of acute in children in Burkina Faso, Mali, and Senegal. The intervention is implemented Helen Keller International and evaluated by the International Food Policy Research Institute (IFPRI) using mixed study designs. The PROMIS project looks to improve performance and beneficiary coverage of current community-based management of acute malnutrition (CMAM) programmes by integrating a package of preventive measures into child acute malnutrition (AM) screening offered by different delivery platforms. Impacts on child AM prevalence and incidence are hypothesised. In Mali and Burkina Faso, the programme's impact is assessed using a cluster randomised controlled design, while in Senegal, a smaller study assesses the programme's feasibility in a peri-urban setting.

In Mali, the delivery platform consists of monthly community health volunteers-led village gatherings of caregivers with children 6-23 months of age to screen children for AM and to deliver the enhanced preventive package (strengthened Behaviour Change Communication (BCC) on nutrition and health, and a small quantity of lipid-based nutrient supplement (SQ-LNS)). The comparison group receives monthly village-based group BCC and screening for child AM. In Burkina Faso, well-baby consultations (WBC) in health centres is the primary platform to offer monthly screening for AM among infants starting at birth. Caregivers of infants from 0-6 months allocated to the intervention group that participate in WBC receive strengthened BCC on nutrition and health after regular child AM screening. From the age of six months onwards, the provision of preventive SQ-LNS is added. The comparison group receives unspecific BCC as prescribed by the national policy. In Senegal, community health workers trained by local NGOs organise group

BCC, screen children for AM and distribute SQ-LNS to caregivers of children 6-23 months of age.

In Mali and Burkina Faso, the programme's impact is assessed by two study designs. A baseline-endline comparison study assesses the programme's impact on the prevalence of acute malnutrition, whereas a longitudinal study with monthly follow-up measurements during 18 months evaluates the preventive impact on the incidence of child AM. A mixed methods process evaluation assesses the programme's impact pathways and feasibility. Finally, a cost-effectiveness study will provide insight into the economic dimension of this integrated programme. Results will be available at the end of 2017 and throughout 2018.

Video footage of the conference presentation is available at: <http://bit.ly/2k8Zodl>

For more information, contact: Lieven Huybregts, email: L.Huybregts@cgiair.org

Effects of multi-annual seasonal unconditional cash transfers on young children's nutritional status and morbidity in Burkina Faso: the MAM'Out trial

The MAM'Out research project aims to test the effectiveness and cost-effectiveness of a seasonal and multiannual cash transfer programme, likely to influence multiple underlying causes of undernutrition. The two-arm cluster randomised controlled trial was implemented in 2015 and 2016 in Burkina Faso. The study was informed by a Nutrition Causal Analysis that identified a number of perceived causes of undernutrition in the population: women's financial insecurity, inadequate birth spacing and poor access to potable water. A formative re-

search was conducted to assess the relevance of a cash based intervention and provided detailed operational guidance on the target population, the type of cash transfer, the seasonality, the delivery mechanism and the amount to transfer. Participating households in the intervention group were offered seasonal unconditional cash transfers (UCTs) from July to November, over two years (2013 and 2014). A monthly allowance of 10,000 XOF (≈US\$17) was given by mobile phone to mothers, identified as primary recipients of the transfers. Mothers were told that the

cash transfer was to support their child's development and to prevent undernutrition. Trained data collectors performed home visits on a quarterly basis to collect quantitative data such as child anthropometrics and morbidity, socio economic and demographic indicators. Results will be published in 2017.

Video footage of the conference presentation is available at <http://bit.ly/2kAaAMG>

For more information, contact: Freddy Houngré, email: fhongbe@actioncontrelafaim.org

Effectiveness of adding a household WASH-package to a routine outpatient programme for severe acute malnutrition in Chad – the Ouadi'nut study

Action Contre la Faim is currently implementing a cluster randomised controlled trial in Mao and Mondo health districts, Kanem region in Chad, in partnership with the Institute of Tropical Medicine in Antwerp, Belgium, and the Sahel Association of Applied Research for Sustainable Development (ASRADD) in Chad. The study is investigating the effectiveness of adding a household water, sanitation and hygiene (WASH) package to a routine outpatient programme for severe acute malnutrition. The aim is to protect children against new episodes

of diarrhoea and other WASH-related infections, and to contribute to nutritional recovery. The household WASH-package includes: 1) Household water treatment and hygiene kit (water container, water disinfection consumables, soap, cup, simple hygiene promotion leaflet with images); 2) Weekly hygiene promotion sessions at health centre level with others/caretakers of children admitted to the programme. Primary evaluation outcomes are recovery and relapse proportions. Secondary outcomes include time-to-recovery, weight gain, longitudinal preva-

lence of morbidity (diarrhoea, vomiting, cough, and fever), and adherence to the household WASH-package, hygiene and care practices of the mothers/caretakers.

The trial is registered at clinicaltrials.gov under the identifier: NCT02486523. The final results and recommendations will be published in 2017.

For more information, contact: Mathias Altmann, maltmann@actioncontrelafaim.org

Delivering SAM treatment through community health workers in Mali

Community-based management of severe acute malnutrition (SAM) has increased access to treatment, but coverage of cases remains inadequate. Experience from other platforms show that modifications to the service delivery model, such as the delivery of malaria, pneumonia and diarrhoea health services by Community Health Workers (CHWs) at community level, can lead to over 90% coverage of affected cases. More evidence is needed to develop a similar model using CHW for the treatment of SAM, to allow Ministry of Health to adapt treatment models to deliver higher coverage and perform-

ance. A clinical, prospective, multi-centre cohort study was conducted between February 2015 and February 2016 by ACF in Kita in Southwest Mali, to investigate if SAM treatment delivered through CHWs is as effective as treatment delivered at health facilities. Secondary objectives were to assess the coverage, quality of care and cost-effectiveness of the intervention compared to routine outpatient care. One cohort (consisting of four health centres) followed a traditional outpatient model of treating SAM (control group) and the second cohort (consisting of three health centres) used CHWs to treat uncomplicated SAM cases in

the community (intervention group). The allocation of treatment between the two groups was randomised. Clinical outcomes (cure, death and defaulter rates), cost effectiveness, treatment coverage and quality of care were examined in both the control and intervention groups. Results will be made available in 2017.

Video footage of the conference presentation is available at: <http://bit.ly/2jboaKj>

For more information, contact: Pilar Charle, email: pcharle@accioncontraelhambre.org

A health educator leads an awareness session for women

Tackling non-communicable disease among Syrian refugees and vulnerable host communities in Jordan

L Hyatt, IOCC, Jordan, 2016

By Loren Hyatt



Loren Hyatt is the Programme Manager for International Orthodox Christian Charities (IOCC) in Amman, Jordan, where she oversees a wide portfolio of projects supporting Syrian refugees and vulnerable Jordanians. Previously, Loren worked with Lutheran World Relief, USAID's Office of U.S. Foreign Disaster Assistance, and the White House. Loren is a graduate of Georgetown University (Master of Science in Foreign Service), where she studied international development and humanitarian emergencies.

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Location: *Jordan*

What we know: Non-communicable disease (NCD) is a leading cause of death in low and middle-income countries. In emergency response, NCDs are often overlooked.

What this article adds: In Jordan, NCD prevalence is high among the resident population and Syrian refugees, overburdening the health system. More obvious medical needs have been prioritised in the humanitarian response. NCD prevention and management amongst refugees is further constrained by unpredictable humanitarian assistance, costs and prioritisation of acute needs by both those affected and responders. In 2015 and 2016, community awareness sessions on NCDs were implemented by IOCC in four governorates through a network of 11 community-based organisations, targeting both Jordanians and Syrian refugees. Sessions included screening (blood pressure, weight and height) and collaboration with a local health organisation that enabled access to free healthcare services. Attendance (mainly women) and demand to continue was high. The programme is being expanded to targeted populations and in new areas. In addition, NCD education will be integrated into IYCF activities. Greater coordination around NCDs in Jordan is anticipated in 2017.

Context

Each year, non-communicable diseases (NCDs) lead to an estimated 38 million deaths, according to the World Health Organization (WHO) (WHO, 2015). These diseases affect people of all ages, in all regions of the world. In the throes of an emergency, the impact of NCDs is often overlooked and brushed aside in the rush to address more obvious health concerns, such as injuries, trauma, and acute malnutrition. However, if there is anything that humanitarian actors have learned from recent disasters, it is that preventative health, particularly of NCDs, cannot be overlooked.

WHO estimates that 60% of all deaths in the world are a result of four primary NCDs: cardiovascular diseases, diabetes, cancer and chronic respiratory diseases (WHO, 2009). Of these deaths, 80% occur in low and middle-income countries,

according to WHO. Once seen as a problem of rich or ageing countries, research has found that the impact of NCDs is felt strongly in low and middle-income countries, where NCDs are now the leading cause of death (WHO, 2011).

NCDs also have a direct link with nutrition (UNSCN, 2011). These diseases can result from, as well as lead to, increased prevalence of nutrition problems, particularly among vulnerable populations. Nutrition-related conditions, such as overweight and obesity, have a direct impact on the rise of NCDs. Food, diets, and nutritional status are important determinants of NCDs, as diet and nutritional status can lead to and impact cardiovascular diseases, some cancers and diabetes, as well as blood pressure and cholesterol levels (WCRE, 2014). Nutrition in-utero, as well as that of infants and young children, has shown to have

direct links to the vulnerability of an adult developing a nutrition-related NCD (SPRING, 2013), which emphasises the importance of proper nutrition during pregnancy, as well as infant and young child feeding (IYCF) practices.

In the immediate aftermath of an emergency, NCDs are often overlooked but must be addressed. People suffering from NCDs are particularly vulnerable during an emergency. They require continuous care for their disease over an extended period, which may be impossible depending on the context of the emergency; often need ongoing treatment or medication, which may be unavailable or inaccessible due to the crisis; and can easily suffer from acute complications in an unstable environment (UN Interagency Task Force on NCDs, 2016). Emergencies can lead to the worsening of NCDs among those already affected and also to the development of NCDs among populations affected by crisis that may no longer have access to preventative health services.

At the provider level, emergencies can impede the ability of health services to treat those with NCDs. Needed diagnostic equipment and medication may be lost or damaged. Access to healthcare facilities may be difficult for staff and patients. The ability of healthcare providers to diagnose, manage and treat an increased number of NCD cases may be beyond the capacity of disaster-affected health services. As research has identified in previous emergency settings, a lapse in care for NCD patients, even for a short amount of time, can result in higher levels of disability and premature death among an affected population (WHO, 2015 [2]). A lack of treatment of NCDs during emergencies can have long-term impacts on individuals, healthcare systems, and even whole countries.

Healthcare providers face a number of challenges in responding to nutrition during an emergency, which can lead to increased prevalence of NCDs. Providers may not be able to access affected populations or provide them with the services and/or supplies needed. Those impacted by a disaster may turn to coping strategies, such as skipping meals or prioritising food for particular family members, in post-disaster situations where food is scarce. Additionally, food shortages, including limited or unavailability of nutritious food, lack of safe water, and poor sanitation and hygiene practices can impact the ability of disaster-affected populations to meet nutritional needs and stay healthy. Breastfeeding can also be more difficult for mothers in an uncertain environment where they may lack privacy, be on the move, or face other challenges to feeding their children.

While more attention is being paid to NCDs in emergencies, there is a greater need for advocacy of issues and challenges in addressing NCDs in emergencies. Increased incorporation and integration of NCD interventions in general healthcare provision is needed, as well as the development of guidelines for clinical management of NCDs in emergencies (Demaio et al, 2013).

A recent symposium on NCDs in humanitarian settings also highlighted the importance of humanitarians better understanding the needs of those with NCDs and those treating NCDs in an emergency setting. Emphasizing the “mortality consequences of treatment interruptions,” the event confirmed the need for guidelines and tools for NCDs in emergencies as little guidance exists on the best practices. Ruby et al (2015) confirmed that limited evidence exists on the effectiveness of interventions related to NCDs in emergencies; however, the review also found that standardisation of care and patient follow-up are key in the aftermath of a disaster when responding to NCD-related needs.

Humanitarian actors are exploring additional ways to address nutrition in emergencies so that poor nutritional status does not lead to or worsen already existing NCDs among disaster-affected populations. Expanding general awareness of nutrition and its impact on health is important, as affected populations typically have limited resources and must make difficult spending decisions.

Additionally, humanitarian actors have been implementing cash-for-health and cash-for-nutrition¹ programming, which helps to address immediate health and nutritional needs, while also supporting the prevention and treatment of NCDs. More holistic, multi-sector humanitarian programming that includes health and nutrition is also warranted – for example, implementation of an agriculture project that incorporates awareness sessions on nutrition for beneficiaries alongside the project’s primary food security or livelihood activities and objectives.

In addition to impacting individual health, responding to NCDs can be taxing for healthcare systems. As more people are impacted by NCDs, more needs emerge for the healthcare infrastructure, equipment and services to treat these diseases; things that low and middle-income countries are often not able to afford or can easily overlook when responding to more immediate needs in an emergency setting. In addition to the infrastructure, the will and an enabling environment must exist among policy-makers to promote policies that help respond to and mitigate the impact of NCDs, such as advocating for smoke-free laws, promotion of healthy diet, protections against harmful use of alcohol, and urban planning to promote physical activity (WHO, 2011).

In addition to impacting individual health and healthcare systems, NCDs can also hamper and threaten the progress of entire countries in the aftermath of a disaster. The World Economic Forum has reported that NCDs are among the most important and severe threats to economic development, particularly as NCDs lead to reductions in productivity and family income, which results in fewer jobs and fewer people escaping poverty (WHO, 2011). Vulnerable populations, particularly those affected by a disaster, are more likely to be hit hard by NCDs and less likely to access healthcare, which can drain

household resources and push poor families further into poverty.

Additionally, WHO reports that NCDs can lead to loss of educational investments, as well as labour productivity (WHO, 2009) which can prevent people from escaping poverty and stifle economic growth. NCDs can reduce incentives to save if those diagnosed anticipate a shorter life; can reduce social capital through the loss of qualified and skilled professionals, teachers, and labourers; and, can impact economic earnings of those caring for chronically ill patients as the caregiver loses the opportunity to work and earn wages (WHO, 2009).

People with NCDs in any context are faced with a number of barriers to accessing treatment. Overcoming these barriers can be difficult or even impossible for those living in poverty or recovering from an emergency. NCDs require regular visits with healthcare providers. Patients must be able to afford ongoing medical care, as well as the transportation to reach this care, the opportunity cost of the time spent seeking care, and the medications needed to treat their conditions. In Lebanon, for example, refugees seek care for NCDs through primary healthcare centres, which requires use of out-of-pocket money at a substantial burden (Doocey et al, 2016). Treatment over the course of one’s life can drain household income and savings and even impoverish an entire family. Additionally, the poor and displaced are often less easily able to make needed lifestyle changes to prevent or mitigate the impact of NCDs, such as paying higher prices for food that is more nutritious rather than purchasing the often cheaper, processed foods.

Situation in Jordan

The impact of NCDs is particularly troublesome in a country like Jordan, where the NCD prevalence is high among the more than 655,000 Syrian refugees (UNHCR, 2016), who have come to the country since conflict broke out in Syria in 2011, as well as among the Jordanian host community population. Responding to the health needs of both populations has burdened Jordan’s healthcare system and stressed already-limited resources.

In Jordan, WHO reports that NCDs are estimated to account for 76% of total deaths in the country (WHO, 2014 [2]). Among Jordanians, the probability of dying between the ages of 30 and 70 years from one of the four primary NCDs is 20% (WHO, 2014 [2]). While healthcare for those with NCDs in Jordan is available, research has found that the demand for acute

¹ Cash-for-nutrition programming could be implemented in a number of different ways. One example would be provision of cash to households who are identified as having a malnourished member. Selected households would use cash received through the programme for the purchase of needed nutritious food, in addition to the medical treatment received by the malnourished household member. Providing cash would allow the household to purchase the items most needed when resources are limited and help ensure that additional family members do not also become malnourished. Cash could also be a way to address the underlying causes of malnutrition and therefore prevent relapse once children are cured.

care is high, but management of chronic NCDs and demand for prevention services is weak (RRP6, 2014).

Before conflict broke out in Syria, WHO estimated that 77% of all deaths in the country were attributed to NCDs in 2011 (WHO, 2011 [2]). Today, the impact of NCDs continues to affect those living in Syria and has followed the millions of Syrian refugees registered with UN-HCR to neighbouring countries, such as Jordan, which are struggling to respond to the health needs of these refugees on top of the needs of the host community population.

For those Syrian refugees with NCDs in Jordan, the situation can be bleak. Life as a refugee can make living with an NCD, or even identifying that you have one, difficult. Humanitarian assistance may not subsidise all the costs of a refugee's NCD-related needs, and refugees often feel that they cannot afford to use their limited resources to seek medical treatment. (Doocy et al (2016) identify cost as the primary barrier for those Syrian refugee households in Jordan with NCDs who are not receiving treatment.) Families are often unsure from where their next meal will come and rely on support to survive. Seeking medical care is expensive when displaced and living in poverty, as many refugees are.

And, if refugees do have cash to spare, they are more likely to spend it on food for their families or rent to keep a roof over their heads rather than addressing longer-term, slow developing health issues, such as NCDs. When buying food, refugees often have to make difficult purchasing decisions with their limited resources. For example, a cost-of-diet exercise² led by International Medical Corps in July 2016 with the participation of international non-governmental organisation (INGO) representatives, including International Orthodox Christian Charities (IOCC) staff, in Jordan's Azraq refugee camp found that a nutritious diet is available in the camp; however, when looking at the basic dietary habits of Syrian refugees living in the camp, a nutritious diet is not affordable, given the value of the food vouchers refugees currently receive from the UN World Food Programme (WFP) (IMC, 2016).

IOCC and NCDs in Jordan

In Jordan, IOCC has found that NCDs are of particular concern for both Syrian refugees and vulnerable Jordanians. Reports indicate that more than half of Syrian refugee households in Jordan have a member suffering from an NCD (Doocy et al, 2015), on top of the already high prevalence of NCDs seen among Jordanian host community members. Hosting refugees and responding to their health needs, as well as those of the Jordanian population, has put significant pressure on Jordan's already strained health services and infrastructure.

In response to identified needs, IOCC planned community awareness sessions throughout four governorates – Amman, Irbid, Mafraq, and Zarqa – with high concentrations of Syrian refugees and vulnerable Jordanians in late 2015

Box 1 Expanding target groups in 2017

During awareness sessions held in 2015–2016, attendees were primarily women. However, for 2016–2017 project implementation, IOCC has taken steps to better reach men, women, and adolescents separately with key messages related to nutrition, NCDs, and healthier lifestyles. IOCC has expanded its health and nutrition team to include both male and female nutritionists who have designed awareness sessions targeting the specific population for each session. IOCC is also collaborating with Jordan's National Centre for Culture & Arts to develop a play and recreational activities for adolescents (of both genders) that shares key messages on nutrition, NCDs, and healthy lifestyles. While women are typically assumed to be more closely involved with the health of the family, particularly children, IOCC's awareness sessions aim to raise knowledge among all household members about NCDs, IYCF, and healthier lifestyle choices. In planning its awareness sessions, IOCC has also taken into consideration factors that may impact the attendance of a particular group. For example, IOCC has ensured that sessions are held at varying times during the day as not to interfere with work or other commitments beneficiaries have, as well as having space for mothers to bring their children with them to sessions. IOCC also invites attendees living around the community centre where the awareness sessions are held so that transportation issues do not negatively impact attendance.

and early 2016 to raise awareness about the impact of NCDs, encourage those affected by these diseases to seek treatment, direct those interested and in need to service providers, and demonstrate ways in which affected populations could mitigate the impact of an NCD they were suffering from or potentially prevent a future disease.

These sessions on NCDs were the first of their kind for IOCC in Jordan and were of great interest to communities with high concentrations of refugees. Aiming to reach a broad audience of those with NCDs, as well as those not suffering from the diseases, IOCC worked through a network of 11 community-based organisations (CBOs) to hold awareness sessions. IOCC collaborated with each CBO to invite Jordanians, Syrian refugees, and others who the sessions would be helpful for, of interest to, and to whose health the session would potentially make a difference. Working closely with these populations on a daily basis, each CBO invited those who would potentially find these sessions most useful.

In total, 1,895 people attended IOCC's NCD awareness sessions through 41 community awareness sessions. Attendees included both men (14%) and women (86%) and represented a wide age group – from young adults to the elderly – of Syrian refugees (60%), Jordanians (39%) and people of other nationalities (1%). All of those in attendance were considered to be vulnerable and were registered for humanitarian assistance with the CBO that invited them. Attendees included those with NCDs, caregivers of people with NCDs, and those without NCDs who could take the information back to their families and focus on prevention.

Community-awareness sessions were held in partnership with a local health organisation, through which session attendees could access free healthcare services. Led by health educators, the sessions aimed to increase men and women's knowledge regarding NCDs, correct previously held misconceptions about these diseases, and advocate for behavioural change related to the

prevention and treatment of NCDs. Through the community awareness sessions, IOCC took the opportunity to highlight the importance of routine health checkups for participants. Health educators provided information to session attendees on the services offered by health clinics and how those services could be accessed, particularly for those in attendance with NCDs or who were concerned that they may potentially suffer from a NCD. While community-awareness sessions focused generally on the primary NCDs that impact Jordanians and Syrian refugees, health educators allowed time toward the end of each session for attendees to ask questions particular to their own health and condition. Health educators provided one-on-one guidance as there was interest and time allowed. While each beneficiary only attended one awareness session, based on post-session surveys, beneficiaries expressed interest in an ongoing series of sessions.

In addition to receiving information during the sessions, health educators conducted necessary screening for NCDs through measuring blood pressure, weight, and height of all participants prior to the sessions so that attendees were better informed on their personal health. This information could be used during the session as health educators explained risk factors for each of the NCDs, as well as methods to prevent NCDs and mitigate their impacts. Examples of information covered during sessions include: promoting physical activity and discussing ways to get exercise when safety or cultural constraints may impact ability to leave the home; learning the food groups and appropriate amounts of each to be consumed daily, as well as how those receiving WFP food vouchers could use the assistance received to purchase nutritious food for the whole family; and smoking cessation in a context where smoking cigarettes and shisha is prevalent among adolescents and adults.

² A cost-of-diet exercise looks at the lowest cost, quantity and combination of local foods a family requires to meet its average needs for energy and recommended intake of protein, fat and micronutrients.

Overall, IOCC found the awareness sessions on NCDs to be a success. Attendees repeatedly asked when additional sessions would be held and identified particular topics that they would be interested in learning more about, such as cancer and issues specific to women's health. IOCC took these recommendations into account, as well as findings of additional assessments on health and nutrition of refugees and host communities members, in designing its 2016-2017 interventions.

IOCC is currently in the process of expanding its work in health and nutrition in Jordan. Based on needs identified and lessons learned from the 2015-2016 awareness sessions (see Box 1 for an example), IOCC is expanding its health and nutrition programme to reach targeted populations with tailored messaging aimed at improving the health and nutrition of both Syrian refugees and vulnerable Jordanians. IOCC will be continuing its awareness sessions at the community level for adults both raising community awareness and linking session attendees with nearby healthcare providers. In the coming months, IOCC will be scaling up its activities in Amman, Irbid, Mafraq, and Zarqa governorates, connecting with new CBOs and reaching new audiences.

While raising awareness about NCDs is important, awareness itself is not enough to address the challenges of NCDs in emergencies, including challenges faced by those affected by the Syria crisis in Jordan. Given the link between nutrition and development of NCDs (Singhal, 2016), IOCC plans to take an integrative approach to educating communities on NCDs through its health and nutrition activities in the coming months, including a focus on IYCF, building the capacity of local healthcare providers to screen for and respond to malnutrition, formation of the peer support groups where NCD and nutrition key messaging will be incorporated into regular meetings and awareness-raising sessions,

and one-on-one IYCF counselling, as needed, along with referrals to specialised healthcare providers with the equipment, medication and expertise to address health concerns, such as NCDs and malnutrition.

Awareness sessions on health and nutrition fill a gap, contributing to community knowledge in the prevention, mitigation, and treatment of malnutrition and NCDs; however, IOCC has found the availability of ongoing and accessible services for those with NCDs is needed, such as counselling from healthcare professionals and access to medications and specialised services. While IOCC health educators have and continue to provide tailored advice to those affected by NCDs during awareness sessions, IOCC has observed a need to provide further assistance to individuals with chronic diseases through specialised care and treatment.

In 2017, humanitarian actors hope to see more coordination efforts toward addressing NCDs in Jordan. Discussions have been held in the monthly Health Sector Working Group, which is chaired by the Office of the U.N. High Commissioner for Refugees (UNHCR) and WHO, about the future of a NCD Task Force in Jordan. Led by WHO and the Government of Jordan (GoJ) Ministry of Health (MoH), the NCD Task Force has been inactive since late 2015. In addition to this mechanism, NCDs are also a topic discussed in the Community Health Task Force in Jordan where humanitarian actors can share information about the pressing issue of NCDs and coordinate a way forward for both Jordanians and Syrian refugees at the community level. While Jordan currently has a strategy for smoking cessation, as well as the National Strategy and Plan of Action against Diabetes, Hypertension, Dyslipidemia, and Obesity, there are a number of actors who are interested in operationalising these plans and doing more to address the impact of NCDs in Jordan alongside the government.

Conclusions

Overall, NCDs have a far greater impact, particularly on those in disaster contexts, than may initially be apparent. In the rush to respond to emergency needs, humanitarian actors must not overlook the importance of helping communities affected by disaster or crisis to address the longer-term, more slowly developing medical needs related to NCDs. A holistic approach to addressing both the immediate identification of diseases and the ongoing and long-term impacts of NCDs must be taken. By bringing NCDs to the forefront of an emergency response, humanitarian actors not only help those affected in the short-term but may also prevent long-term damage to an individual's health, as well as the ability of an affected country to recover and pursue future economic growth.

Looking to the future, IOCC hopes to continue promoting awareness of NCDs at the community level in Jordan and also collaborate with the GoJ, WHO, UNHCR, and other humanitarian actors on supporting individual healthcare, as well as larger health systems and infrastructure, in order to be able to respond to the long-term impact that NCDs have on a population. IOCC will continue to raise the issue of NCDs so that these disease are not overlooked, forgotten, or pushed aside in favour of other health topics that may be more attention-grabbing or seemingly more urgent.

Treatment and education on prevention of NCDs must be integrated into primary healthcare and explicitly addressed by healthcare providers. Investing in services for NCDs will not only help vulnerable Jordanians and Syrian refugees in the short-term, but this investment will also reduce the long-term burden of care and the rising costs of medical treatment that will be needed. As humanitarian actors look at a potential transition in assistance from relief to longer-term resilience, treatment of NCDs must not be left behind.

For more information, contact: Loren Hyatt, lhyatt@ioccc.org

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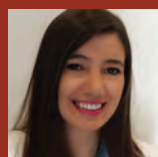
Treatment of malnutrition in Lebanon: institutionalisation with the Ministry of Public Health – steps and lessons learned

By Linda Shaker-Berbari, Pressila Derjany Khoueiry and Dima Ousta



Linda Shaker Berbari works with International Orthodox Christian Charities (IOCC) as Regional Technical Advisor on Health, Nutrition and Infant and Young Child Feeding (IYCF)

for the Middle East region. Between October 2013 and January 2015, she was Country Representative for IOCC Lebanon, overseeing operations in Lebanon. Linda has more than 15 years' experience in community nutrition, including nutrition in emergencies and IYCF.



Pressila Derjany Khoueiry is the Health Programme Coordinator at IOCC. Pressila has a BSc in Nutritional Sciences and University Diploma in Human Lactation and Breastfeeding.



Dima Ousta was the Health and Nutrition Programme Coordinator at IOCC between September 2013 and October 2015. Dima worked as a Consultant for UNICEF in Serbia

and Greece on IYCF-E in 2015 and 2016 response to the Europe Refugee and Migrant Crisis and has recently joined Nurture Project International (NPI) as a virtual volunteer for the IYCF-E response in Greece.

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IOCC providing capacity building training to staffs of the primary healthcare centres on screening and treatment of acute malnutrition

Rana Hage/IOCC, Mount Lebanon, 2016

Location: *Lebanon*

What we know: Between 2011 and 2014, services to treat acute malnutrition among Syrian refugees in Lebanon were scaled up and delivered by IOCC at primary health centre (PHC) level.

What this article adds: From 2015, acute malnutrition treatment services were transitioned to integrate within PHCs, led by the Ministry of Public Health (MoPH) in close collaboration with UNICEF. PHC staff were tasked with screening, referral and treatment as routine activity. IOCC's role transitioned from direct implementation to resource review and update, training (workshops and on-the-job), and mentoring (two three-month periods of support, 2015 and 2016). A significant challenge to integration is competing demands on health workers that limit/preclude screening and treatment, with calls for incentives/more staff (neither are provided). Ongoing training of staff is needed at facility level to refresh staff knowledge and allow for turnover when needed. Therapeutic foods are currently provided by UNICEF to PHCs; subsidised consultation costs are met by families. The leadership and management of MoPH is essential to sustainability; quality assurance of staff and services informed by collation of caseload data and outcomes of treatment is needed.

Background

International Orthodox Christian Charities (IOCC) started its nutrition programme in Lebanon as a result of the Syrian refugee crisis. From 2011-2014, the number of refugees increased and cases of acute malnutrition started to appear. In response, IOCC, with support from UNICEF and UNHCR, initiated malnutrition treatment in primary health care centres (PHCs) in the form of community-based management of acute malnutrition (CMAM) and contributed to capacity-building of the Lebanese Ministry of Public Health (MoPH). This programme was implemented in selected vulnerable localities in all six governorates of Lebanon and described in a 2015 article in *Field Exchange* (Berbari et al, 2015).

This article continues the story of the work by IOCC during and after 2015. It describes programme phase-out and transition of acute malnutrition treatment services to the public health services in Lebanon, aiming to institutionalise them. This was achieved through a preparation and implementation phase involving co-review of programme materials and forms with the MoPH and UNICEF, recruitment of nutrition mentors and internal training of trainers (TOT), training rollout, and coaching, mentoring and monitoring of implementation.

Introduction

During phase 1 of the programme (ibid), IOCC screened 60,000 children under five years of age for acute malnutrition; 2,400

cases were identified and treated. Forty-two PHCs were engaged in the screening and treatment of malnutrition through support from IOCC human resources. Starting at the end of 2015, the MoPH conducted a cost-benefit analysis of the nutrition programmes in Lebanon. Based on this and available data on the nutritional status of children, it developed a recommended integration of activities within its network of PHCs to enable sustainability of activities and preparedness of centres to respond.

IOCC's role accordingly changed drastically from frontline, direct contact with beneficiaries to trainer and mentor for the implementation of an integrated programme. Activities were revised and implemented as per MoPH recommendations. A new programme was developed – Phase 2 – focused on capacity-building and provision of on-the-job support (mentoring) for PHCs within the MoPH network, alongside other non-governmental organisations (NGOs), Relief International and AVSI (www.avsi.org). The programme also involved support to PHCs to report on the nutrition indicators of all children under five years old as part of the Health Information System (HIS), training of mobile team staff of a local NGO on screening and referral of acute malnutrition at the field level, and training a selected number of Ministry of Social Affairs (MOSA) Social Development Centres (SDCs) on screening and referral of acute malnutrition.

In terms of nutritional status, global acute malnutrition prevalence was low (4.5%, SMART surveys, 2012, and 2.2% in the most recent SMART survey of 2013 (UNICEF, 2014). Anthropometric results of refugee children 0-59 months from the 2016 Vulnerability Assessment



of Syrian Refugees (VASyr) data show a GAM rate of 2.3%, which indicates stability throughout the years.

However, the latest 2016 VASyr (WFP, UNHCR, UNICEF, 2016) also reveals significant causes for nutrition concern; in particular, a high disease burden among children under five years old and inappropriate infant and young child feeding (IYCF) practices. While there was a small increase in exclusive breastfeeding (EBF) rate compared with 2015, only 3% of children aged 6-23 months met the minimum acceptable diet; 15% of children aged 6-17 months met the WHO recommended minimum diet diversity thresholds; and 18% of children aged 6-23 months met the WHO recommended acceptable meal frequency. Also, only 62% of children aged 6-23 months were found to consume solid foods.

Until 2015, the cost of treatment of malnutrition, including transportation of families to and from the PHC, was supported by UNICEF, UNHCR and other NGOs. Programme supplies including ready-to-use supplementary food (RUSF) and ready-to-use therapeutic food (RUTF) were provided by UNICEF and distributed through IOCC. UNICEF and MoPH jointly covered the cost of treatment in Phase 2. Supplies were provided to PHCs by UNICEF and provided free to families. A subsidised cost for the medical consultation was paid by the families; Syrian refugees get further subsidised costs from supporting NGOs. In Phase 2, programme data on caseload and nutritional status of children attending PHCs was sent directly to the MoPH by the PHCs, rather than being compiled by IOCC.

Preparation for Phase 2 took place between July and August 2015. It included co-review of all programme materials and internal capacity-building of IOCC to deliver trainings and launch the mentorship programme in 2015. In 2016 a second round of training and mentoring took place, based on the needs identified and requested by MoPH and UNICEF.

Preparation

Review of training and programme material (July-August, 2015)

The development of resource material for screening and management of malnutrition devised in Arabic was an important output of the overall project. This included training materials, treatment forms and referral forms for outpatient and inpatient management of both moderate and severe acute malnutrition (MAM and SAM).

As Lebanon does not have a national protocol for the treatment of malnutrition, the programme drew on international guidelines such as the Harmonised Training Package (HTP)¹ and WHO

Box 1 Overview of training content

Training on screening and referral of acute malnutrition, two days

Day 1:

- Introduction to Nutrition in Emergencies and the importance of preparedness in Lebanon.
- Basics of infant and young child feeding, the International Code of Marketing of Breastmilk Substitutes, Law 47/2008 in Lebanon, and distribution of existing information, education and communication (IEC) materials.
- Anthropometric measurements of acute malnutrition for children under five years of age (theoretical session).
- Use of growth charts.

Day 2:

- Anthropometric measurements of acute malnutrition for children under five years of age (practical session with live simulation exercises)
- Micronutrient supplementation.
- Reporting and use of programme forms.
- Reporting on the HIS (session was covered by MoPH staff).
- Case studies.

Additional parts for one-day, facility-based training on management of acute malnutrition:

- Management of MAM and SAM for children under five years of age.
- Management of acute malnutrition for PLW (added in 2016).

Training on community screening and referral of acute malnutrition – one day

- Introduction to Nutrition in Emergencies and the importance of preparedness in Lebanon.
- Anthropometric measurements of acute malnutrition for children under five years of age (theoretical session and simulation).
- Use of programme forms (referral forms).
- Basics of infant and young child feeding.

¹ GNC, ENN and NutritionWorks (2014). Harmonised Training Package (HTP) version 2. www.enonline.net/resources/htpversion2df

² WHO (2013). *Updates on the Management of Severe Acute Malnutrition in Infants and Children*. apps.who.int/iris/bitstream/10665/95584/1/9789241506328_eng.pdf

Box 2 Nutrition mentor activities

Each mentor covers 10 to 12 PHCs, visiting each PHC once a week or biweekly, as required. The nutrition mentor meets the PHC Director and all PHC staff, explains the details of the CMAM programme, and coaches relevant staff on malnutrition screening and referral. The nutrition mentor engages in screening activities to demonstrate the procedure. In management centres, the nutrition mentor meets with paediatricians to follow up on the treatment of acute malnutrition. On each visit, the nutrition mentor fills out a daily checklist with criteria on programme activities to evaluate the quality of the work within each PHC. On-the-job training is also provided as needed.

Each nutrition mentor sends out an advance weekly schedule detailing planned visits and activities, and submits an end-of-week output report, including quantitative and qualitative data about each centre visited.

Some centres showed positive engagement and initiatives in organising IYCF-awareness sessions at the PHC and the nutrition mentor was always readily available to assist in delivering related information. IEC materials distributed during the trainings were used as reference.

updated guidelines on management of SAM². The programme also relied on experts from the American University of Beirut, who were engaged in the Regional Nutrition in Emergencies Training to adapt the material. At the same time, MoPH with UNICEF have built on the resulting material to develop a national protocol; this has not yet been formalised.

Training material used during Phase 1 was extensively reviewed and approved by MoPH in 2015. In 2016, the same materials were used, with an additional section on nutrition screening and treatment of pregnant and lactating women. Training content is overviewed in Box 1. Two healthcare staff nominated by each MoPH network PHC and selected SDCs attended a two-day training on screening and referral of acute malnutrition. PHCs selected by MoPH to become treatment centres received an additional one-day, facility-based training on the outpatient management of MAM and SAM and referral for inpatient treatment.

Recruitment of mentors and training of trainers (August-October 2015)

To ensure quality interventions and enable simultaneous, standardised trainings across the different regions in Lebanon, an internal, six-day training of trainers (TOT) was organised in 2015 for the IOCC Health and Nutrition team. For the second round of training and mentoring, in 2016 a two-day internal refresher TOT was conducted. The main TOT covered training skills (adult and peer education, development of lesson plans, interactive training skills, etc) and the lesson plans for each of the sessions of the two-day and facility-based trainings.

In parallel, preparations for the mentoring phase were underway, ranging from finalisation of forms, monitoring and reporting tools to the recruitment of 20 nutrition mentors. IOCC built on existing programme forms and tools that were reviewed and approved by the MoPH; re-worked forms were developed in close collaboration with MoPH and UNICEF. IOCC's programme structure and teams were rearranged to accommodate the change from frontline to mentoring role. Recruitment focused on individuals with a nutrition background and CMAM experience from previous programmes in Lebanon (implemented by IOCC, Relief International or Action Against Hunger). All those recruited attended a one-day internal training on mentoring skills and received guidance on the different mentoring cycles and possible scenarios. The aim of this training was to standardise the coaching approach in all PHCs across Lebanon and deliver the same on-the-job support to all staff involved in the integration of CMAM services in the PHCs.

Implementation

Capacity-building and training of all MoPH PHCs (August-October 2015)

As described above, a series of capacity-building trainings (workshops) took place over two periods; August to September 2015, and August to September 2016. Key training activities de-

livered were:

- In 2015, two-day training on malnutrition screening and referral of children under five years old across all areas in Lebanon for 217 MoPH PHCs. In 2016, these were condensed to one-day refresher training – on guidance from the MoPH – and were conducted for 214 MoPH PHCs.
- A total of 427 healthcare providers (nurses, physicians and midwives) attended the training in 2015; 269 attended in 2016.
- A one-day, facility-based training on treatment of acute malnutrition for children under five years old was delivered on-site to 63 PHCs in 2015 and 62 PHCs in 2016.
- In 2016, a one-day training on screening and referral of acute malnutrition was delivered to 85 SDCs under MOSA (90 healthcare providers attended).
- In both 2015 and 2016, IOCC trained field teams from BEYOND, a local NGO, on community screening for malnutrition, both in the North and in the Bekaa Valley. A total of 51 and 101 health staff attended the training in 2015 and 2016 respectively.

Coaching and mentoring of PHC staff (October-December 2015 and October 2016-December 2016)

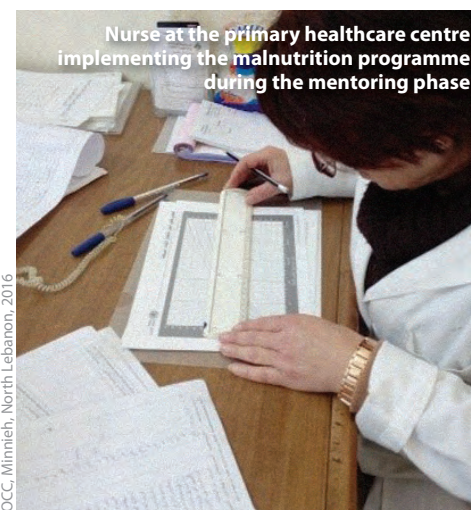
A key component of the programme was the provision of on-the-job coaching and mentoring in 161 PHCs for screening and referral and for screening and management of acute malnutrition in 41 PHCs. In 2015, IOCC provided mentoring to 204 PHCs, AVSI to 10 PHCs in the South, and RI to 11 PHCs (three in Beirut/Mount Lebanon, two in the North and six in the Bekaa Valley), covering a total of 225 PHCs. Mentors from RI and AVSI had attended the trainings of the respective PHCs that they were scheduled to mentor.

The aim of this activity was to provide support for existing staff to carry out new tasks related to screening and treatment of malnutrition and to support reporting on nutrition indicators. All PHC staff who had attended the MoPH training received facility-based, refresher training as the coaching started. One mentor/coach was present at the PHC periodically or as needed. Each nutrition mentor reported back to his/her

IOCC, South Lebanon, 2016



Nurse at the primary health care centre screening for acute malnutrition during the mentoring phase



Nurse at the primary health care centre implementing the malnutrition programme during the mentoring phase

IOCC, Minnieh, North Lebanon, 2016

respective area coordinator. The scope of work of the mentor is described in Box 2.

At the end of the three-month mentoring period, each nutrition mentor completed a narrative report for each PHC, including PHC background information, summary of visits, challenges, solutions, positive initiatives and recommendations. Each report completed with an interview with the PHC director and nurse involved in screening, in order to feedback regarding the integration of services.

On recommendation from MOPH and UNICEF, and given the observed need to provide further support for PHCs, IOCC launched a second stage of mentoring in 2016. Field teams were recruited using the same approach as in 2015. A total of 223 PHCs (62 treatment and 161 screening centres) were supported.

Challenges and lessons learned

Implementation and sustainability of nutrition activities at the PHC level

A number of challenges and lessons learned were highlighted on the sustainability of such activities within PHCs. These included:

The support and endorsement of MoPH is essential for the successful implementation of planned activities by PHCs and compliance with training requirements.

Regular training on screening, referral and/or management of acute malnutrition is necessary as refreshers to trained staff and to provide the opportunity for more staff from PHCs to be trained. This becomes especially important given staff turnover in PHCs. Those trained were not always the ones in charge of implementing the programme at the PHC level; mentors had to provide on-the-job training as needed in order to equip the right staff with the necessary skills. Between the first phase and the second phase of training, a number of staff had changed; therefore, for many, the training delivered by the mentor was their first.

It is important to consider the long-term consequences of providing incentives to healthcare staff for screening and management of acute malnutrition. Providing monthly incentives to PHC staff to take measurements will certainly ensure better staff compliance and motivation, yet incentives may also act as a challenge to sustainability as soon as they can no longer be provided (i.e. when funding is no longer available). Feedback from participants in the training highlighted the need for additional staff in PHCs in order to accommodate and run nutrition activities in a smooth manner. Throughout the mentoring phase, the MoPH decided that incentives would not be paid to PHC staff involved in malnutrition management and that PHCs should provide these services as part of their daily tasks and activities. Thus, provisions must be made within the MOPH's strategy to ensure a proper human

resource structure is in place and that capacity is adequate to run programmes related to child growth.

Reporting and information management is challenging for PHCs who have a limited number of staff and/or who use both written and computerised reporting, as this may create errors. Tablets linked to the HIS have been proposed to be used directly at screening as they are user-friendly and there is less room for error.

Challenges related to the integration of malnutrition services in the PHCs

IOCC staff faced challenges in both mentoring phases. During mentoring visits, PHC staff were constantly overloaded with other PHC activities and barely had time for refresher trainings or for actual screening activities, or even demonstration of screening. With perseverance, nutrition mentors were able to convince the staff of the

So far, implementation has been driven by the availability of ad hoc funding; there is no clear plan regarding steps for a complete phase-out of external support for the activities.

Lack of transportation payments for families and financial coverage of inpatient treatment for cases with complicated SAM were a common challenge to proper case management. MoPH needs to budget for these additional costs when planning for a sustainable integration of malnutrition services in the PHCs.

Recommendations

Recommendations to ensure sustainability of the integration of nutrition services at the PHCs include the following:

PHC staff should be mandated by MoPH to provide malnutrition screening and treatment services. MoPH engagement in routine monitoring and evaluation of PHC staff performance is a priority to assess whether implementation of programme activities is on track and to ensure successful programme continuity. Regular refresher training on screening and management are needed to ensure all relevant staff are trained and updated. Exchange visits of PHC staff conducting screening/treatment with staff in management PHCs should be promoted to allow all to experience the comprehensive programme.

Strong endorsement of PHC-level malnutrition activities by MoPH should be ensured by increasing the number of MoPH staff responsible for supervising activities at PHCs. The latter need to be trained on acute malnutrition in all its components, allowing them to become a reference and provide sustainable support for PHC staff.

The MoPH should analyse the data compiled from the HIS to inform on the nutritional status of children in Lebanon and caseload across PHCs and regions on the management of MAM and SAM.

YCF services should be incorporated into the primary healthcare system, which requires capacity-building of health workers to implement YCF counselling and support, incorporation of YCF services into maternal and child health, and strengthened links and referrals with inpatient and outpatient acute malnutrition treatment services.

For more information, contact: Linda Shaker-Barbari, email: lberbari@iocc.org

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Nurse screening for acute malnutrition at the primary healthcare centre

importance of screening, and this resulted in allocating time daily for malnutrition screening. However, this did not work in all PHCs, as shown in the narrative reports submitted to the MoPH and UNICEF. Many of the PHCs still do not actively screen for malnutrition or only screen when the nutrition mentor is present. As noted above, PHC staff were asking for additional staff to be hired to assist with daily duties, as well as incentives to motivate existing staff involved in malnutrition screening.

Some PHCs were quite remote and at times reaching them was challenging for beneficiaries. These PHCs presented very low caseloads of paediatric patients and reported zero cases of screened children monthly.

After the first mentoring phase, the majority of the PHCs did not carry on with the project activities; PHC staff restarted the screening process when the second mentoring phase began.

A journey to multi-sector nutrition programming in Nepal: evolution, processes and way forward

By Pradiumna Dahal, Anirudra Sharma and Stanley Chitekwe



Pradiumna Dahal is a nutrition specialist with UNICEF Nepal and has more than 15 years' experience in public health, nutrition and food security. Having helped formulate major

nutrition policies, plans and strategies in Nepal, he is one of the core experts supporting the National Planning Commission of the Government of Nepal to develop the Multi-Sector Nutrition Plan (MSNP). He is actively engaged in scaling up nutrition in Nepal.



Anirudra Sharma has worked as a nutrition specialist with UNICEF for 17 years, including as emergency nutrition cluster coordinator for the last six years. He has more than three decades

experience with the Government of Nepal, Save the Children and UNICEF. His scope of work has included formulation of national nutrition and health policies, plans and strategy; national programme design on integrated management of acute malnutrition (IMAM); and disaster risk reduction. He is a core expert team member supporting the National Planning Commission in the MSNP development.



Stanley Chitekwe is the Chief of Nutrition for UNICEF Nepal. He has worked for more than 17 years with UNICEF in Africa and now in South Asia. His vision is to treat acute malnutrition and eradicate

stunting. He is a mentor to many young professionals. His focus is on evidence-based, cost-effective programme delivery and using innovations.

The authors would like to acknowledge the National Planning Commission, Ministry of Health and other sector ministries of the MSNP (Education; Women, Children and Social Welfare; Agriculture, Livestock and Birds; Water and Sanitation; and Federal Affairs and Local Development). The authors also sincerely thank the European Union for their generous support to UNICEF for scaling up MSNP in Nepal, as well as the contributions from other UN agencies and nutrition stakeholders, mainly USAID/Suaahara and World Bank, in rolling out the MSNP in Nepal.

Media Hub

An interview (podcast) with Stanley Chitekwe, by Charulatha Banerjee, ENNs regional KM specialist based in India, is available on the ENN MediaHub, www.ennonline.net/mediahub



Launch of roll-out of implementation of MSNP in one of the districts, Kapilvastu, in Western Terai of Nepal

Location: Nepal

What we know: Multi-sector policies and plans are an increasing feature of country efforts to tackle undernutrition.

What this article adds: In 2012, Nepal developed a Multi-Sector Nutrition Plan (MSNP I), a reflection of 30 years of policy evolution. Rollout included restructure and development of national and district/village level coordination and steering committees, technical working groups and pilots in selected districts. Subsequent scale-up was informed by lessons learned. Since MSNP I, resourcing for nutrition-sensitive programming has significantly increased. Stunting prevalence has fallen from 57% (2001) to 37% (2014); an annual rate of reduction of 3.3%. A 2014 report described a participatory and inclusive MSNP development process, enabled by high-level champions. Recommendations to address identified challenges included urgent improvement in nutrition capacity at district and sub-district levels and continued targeted advocacy; actions have been taken. Moving ahead, there is a need to map interventions and their coverage, stakeholders and resources at district level, identifying gaps; and to develop budget codes for nutrition to facilitate tracking on spend. The six-step process of development for MSNP II (2018-2022) is underway, led by the National Planning Commission, Government of Nepal together with UNICEF.

Multi-sector policy development

Multi-sector thinking on nutrition programming in Nepal began back in 1978 with the first National Nutrition Strategy, followed in 1986 by the Second Nutrition Strategy. These were jointly known as Pokhara Declaration I and II (see Figure 1). Subsequently, the Joint Nutrition Support Programme (JNSP) (1989-1992) was the first attempt at multi-sector programming for nutrition. However, due to poor engagement of sectors while formulating the programme and hence poor ownership, the JNSP had limited success. The 2004 National Nutrition Policy proved to be the first effective response. Developed by the health sector, it was immediately implemented through its annual work plan and budget, with key indicators included in the Health Management Information System (HMIS) and monitored.

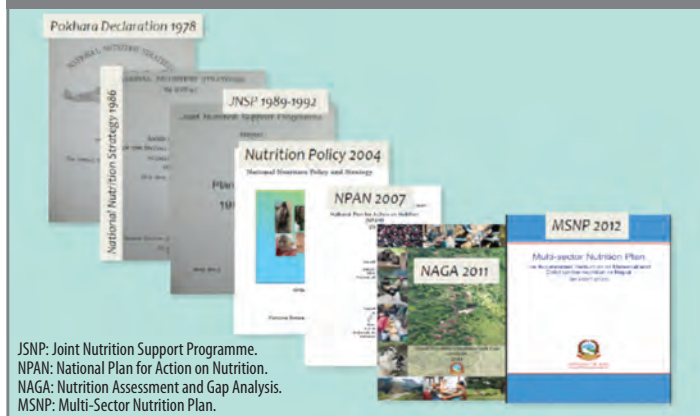
In 2009, the Nutrition Assessment and Gap Analysis (NAGA) identified strengths, weaknesses and gaps in nutrition programming. Primary determinants of undernutrition

identified in the NAGA included inadequate food availability, access and affordability; poor food and care-related behaviours; inadequate food quality/nutrient density; and high prevalence of infection, which reduces food absorption and utilisation (see Figure 2). These reflected the need for a multi-sector approach. Recommendations from NAGA were endorsed by the National Planning Commission (NPC) in 2011 and a Memorandum of Understanding was formally signed between NPC and UNICEF to develop a Multi-Sector Nutrition Plan (MSNP) in Nepal (see Figure 3).

MSNP development and rollout

In May 2011, Nepal joined the Scaling Up Nutrition (SUN) Movement, the fifth country to join and an 'early riser'. This reflected and reinforced the political space and momentum for nutrition in Nepal. In the same year, two national committees on Nutrition and on Food Security were merged into one, the High Level Nutrition and Food Security Steering Committee, chaired by the

Figure 1 Evolution of nutrition policies and plans in Nepal, from the 1978 National Nutrition Strategy to the 2012 Multi-Sector Nutrition Plan



Vice-Chair of the NPC with secretaries of the relevant ministries as members. Various reference groups were formed consisting of government officials, development partners, academia and independent sector experts, to guide multi-sector nutrition reviews and planning in both nutrition-specific and nutrition-sensitive sectors (health, education, governance, WASH and Agriculture). Their defined scope was to review global and national evidences for 'what works'.

Through systematic consultations within and between reference groups, each sector formulated its nutrition objectives and strategies and developed log frames with clear outcomes, outputs and activities. These were later costed and consolidated into one national document – the MSNP – with clear goals and indicators, five-year plans (2013–2017) and ten-year visions (to 2022).

The MSNP was approved by the cabinet of ministers in August 2012 and launched by Prime Minister Dr Baburam Bhattarai in September 2012. Declaration of Commitment for implementation was signed by the NPC, secretaries of the sector ministries, representatives of the United Nations (UN) and development partners, civil society and the private sector.

A high-level coordination committee, chaired by the honourable member of the NPC, was formed at central level to strengthen coordination across government ministries and development partners. In addition, a National Nutrition and Food Security Secretariat was established in 2013 to support the high-level steering and the coordination committee, particularly in strengthening the capacity of sectors in nutrition planning, advocacy, communication, monitoring and evaluation.

Decentralised (district) implementation

The MSNP offered a platform to integrate 'top-down' nutrition plans from the central sector ministries on delivering essential nutrition services, as well as 'bottom-up' nutrition plans made at community and district level that contextualise and prioritise the central plans for implementation. Implementation was planned initially in six districts (Achham, Bajura, Jumla, Kapilvastu, Nawalparashi and Parsa) with a view to gradually

scaling up through a 'learning-by-doing' approach. This was necessary as there was no global guidance on multi-sector, decentralised implementation. Learning was gathered in each district through district-level reviews and at steering committee meetings. A few studies were also undertaken and experiences documented in a review of the MSNP development process in 2014 (see below).

Nutrition and Food Security steering committees were formed initially in all six districts and in village development committees (VDCs); these bodies are proposed in all VDCs, municipalities and districts, in addition to national level. Nutrition 'focal officers' were identified in the districts and trained on MSNP planning and implementation. This model has now been scaled up to cover more than 50 (out of 75) districts as of 2016.

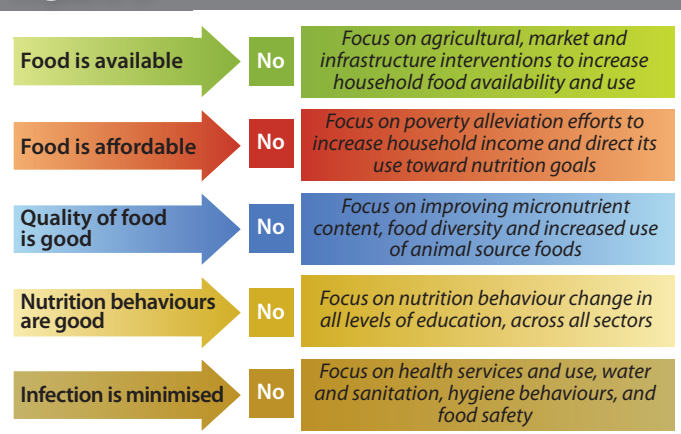
The Multi-sector Nutrition and Food Security Communication and Advocacy Strategy was put in place in 2015 and a national Golden 1,000 Days public awareness campaign was launched in April 2016 to further operationalise the strategy.

Nutrition resourcing and programming

Nutrition budget allocations were determined by analysis by budget heads of different ministries. Cost categories for nutrition-sensitive interventions varied from an estimated 5% to 75% contribution to nutrition. For example, for agriculture, the weighting varied from 10% (e.g. agricultural extension) to 50% for an agriculture and food security project. The cost contribution of nutrition-specific programmes was 100%.

After establishing the MSNP, resources and level of programming on nutrition, particularly on nutrition-sensitive, have significantly increased in Nepal, both through government and development partners. Figure 5 reflects the upward trend in expenditure from 2013–14 to 2015–16. Government funds make up around 40% of all nutrition allocations and closer to 50% of expenditures. Significant projects currently being implemented in line with MSNP include Suaahara II; Feed the Future (USAID funded); Agriculture

Figure 2 NAGA priority determinant model for nutrition



and Food Security Project (AFSP) and Golden Thousand Days (World Bank funded); and the EU-UNICEF partnership for scaling up MSNP.

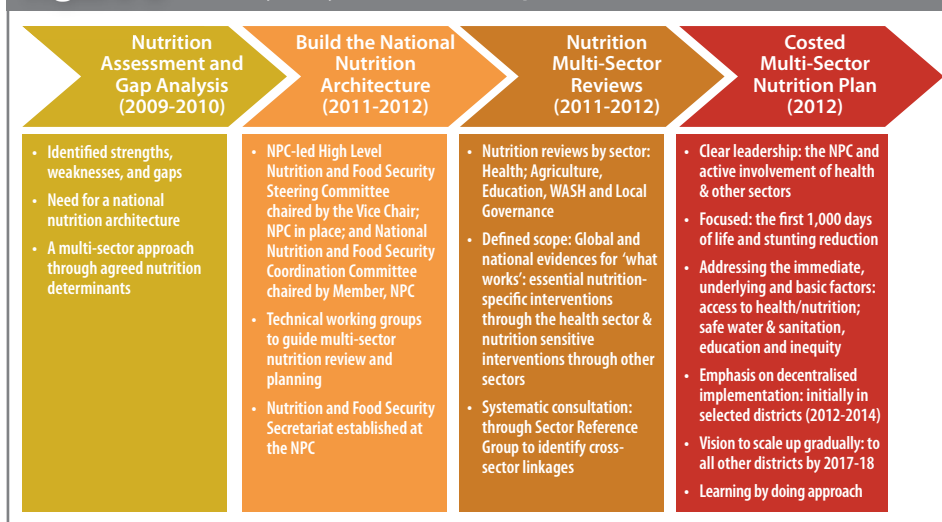
Impact and lessons to date

Although formal evaluation of MSNP has yet to be undertaken, the National Multi-Indicator Cluster Survey (MICS) 2014 revealed that the prevalence of stunting has fallen to 37%, with improvements in infant and young child feeding practices. The average annual rate of reduction of stunting from 2001 (DHS) to 2014 (MICS) is 3.3% (DHS 2001 – 57%; DHS 2006 – 49%, DHS 2011 – 41%). The upcoming national DHS 2017 will shine further light on the impact of the implementation of MSNP on nutrition.

A process of documenting the MSNP was undertaken in 2014 (Shrimpton et al, 2014), which highlighted that the MSNP development process was participatory and inclusive. Furthermore, there is an enabling environment for multi-sector collaboration in Nepal with high-level champions of nutrition. Coordination has improved between stakeholders both at district and national levels. However, the study also highlighted that there is a limited national nutrition capacity, lack of common understanding among all stakeholders and between sectors at central and district level; and need for intensive efforts at district level to ensure effective implementation.

Recommendations included urgent improvement in nutrition capacity at district and sub-district levels and continued advocacy to ensure a consensus-driven results framework for district level decision-making for the MSNP. Acting on these, the 2015 Communication and Advocacy Strategy was one major effort to develop common understanding. The MSNP training manual at central, district and VDC levels was also updated to facilitate this. Regarding capacity development, the MSNP planning Training of Trainers (ToT) has been completed so far for focal officers from different sectors at 17 districts and is planned for the remaining 11 districts by April 2017. The Maternal Infant and Young Child Nutrition Training (as part of health-sector nutrition) was undertaken in more than 50 districts of Nepal through UNICEF, Ministry of Health and partners like Suaahara/USAID.

Figure 3 Summary of key MSNP formulation process



Challenges in implementing the MSNP remain. There is still work to be done to achieve common understanding, commitment and ownership of MSNP by all ministries and stakeholders; a need to mainstream resources and minimise duplication; and rollout of the full MSNP intervention package is needed in all districts. There is limited budget absorptive capacity of the line ministries and a need for continued and strengthened coordination at national and local levels. Furthermore, there is limited institutional and human-resource capacity within sectors at all levels. An effective implementation-monitoring framework for the MSNP is still required.

Next steps

Moving forward, there is a need to map interventions and their coverage, stakeholders and resources at district level and identify gaps.

Periodic financial tracking of investment and expenditure is necessary. The National Planning Commission has now determined that a budget code for nutrition is needed to effectively track investment and expenditure. Nutrition-sensitive costing (proportional allocations to nutrition) to date has required manual analysis by the budget head of different ministries. Budget codes would allow the Ministry of Finance to undertake nutrition-sensitive budgeting at the budget source every year.

The multi-sector architecture at all levels (national, regional, district, municipality and VDCs) needs to be further strengthened and made more functional. For example, committees need to meet more frequently at strategic times, particularly during district-level planning and budgeting, as well as ensure quality of implementation.

The NPC, Government of Nepal has requested UNICEF to lead the process of drafting the new phase of MSNP (MSNP II). This will update and build upon MSNP I, rather than develop a completely new plan. The roadmap for MSNP II (2018-2022) formulation has six steps, already underway:

1. *Deprivation Analysis (By Aug 2016)* – Led

by UNICEF, this was undertaken to understand the current levels and trends of deprivation, including indicators of malnutrition, their severity and where are they prevalent.

2. *Causality Analysis (Sept 2016)* – Causality of malnutrition (including under and over-nutrition) was analysed by context, focusing on three typologies where the prevalence of undernutrition is high and problems are

distinct: the Terai; the Mid and the Far-West mountains and hills; and the rest of the country.

3. *Review of MSNP I Implementation (March 2017)* – A systematic review of MSNP implementation to identify achievements, gaps, lessons learned and best practices will be undertaken by independent expert(s) in consultations with relevant stakeholders. The report is due mid-2017.
4. *Finalising the Theory of Change (March/April 2017)* – Planned.
5. *Finalising the write-up of MSNP II (by mid-2017)* – Planned.
6. *Endorsement/Approval by Government* – Planned.

Thus development of MSNP II (2018-2022) will be informed by reviews, situation analyses, causality analyses, theory-of-change programming and the latest global and national evidence on nutrition.

For more information, contact: Pradiumna Dahal, Nutrition Specialist, UNICEF Nepal, email: pdahal@unicef.org

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Figure 4 The national multi-sector nutrition framework

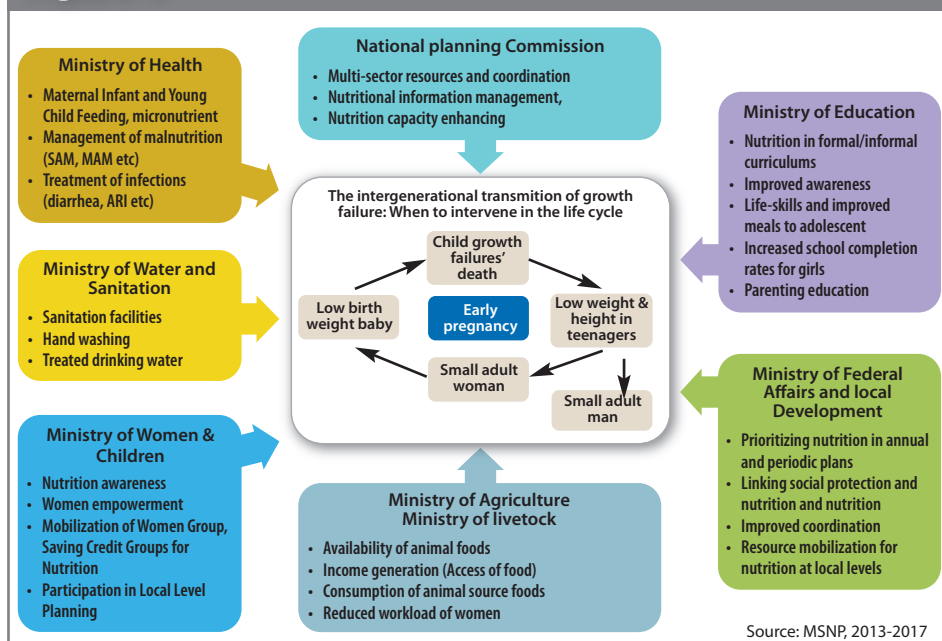
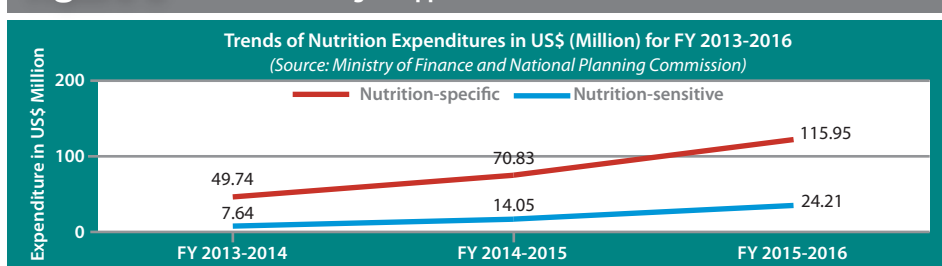


Figure 5 Financial tracking of support for MSNP



New resources from SPRING on evidence-based programming for anaemia



Anaemia is a complex problem with many varied, inter-related causes. Successfully addressing anaemia requires a multi-sectoral approach that is tailored for the specific risk factors in each context, which may vary even between regions and districts within a country. The USAID-funded Strengthening Partnerships, Results and Innovations (SPRING) project recently released two tools that help policy-makers and programme designers to better understand the anaemia situation in their country or local area, and to design appropriate interventions to accelerate the reduction of anaemia.

Landscape Analysis Guidance

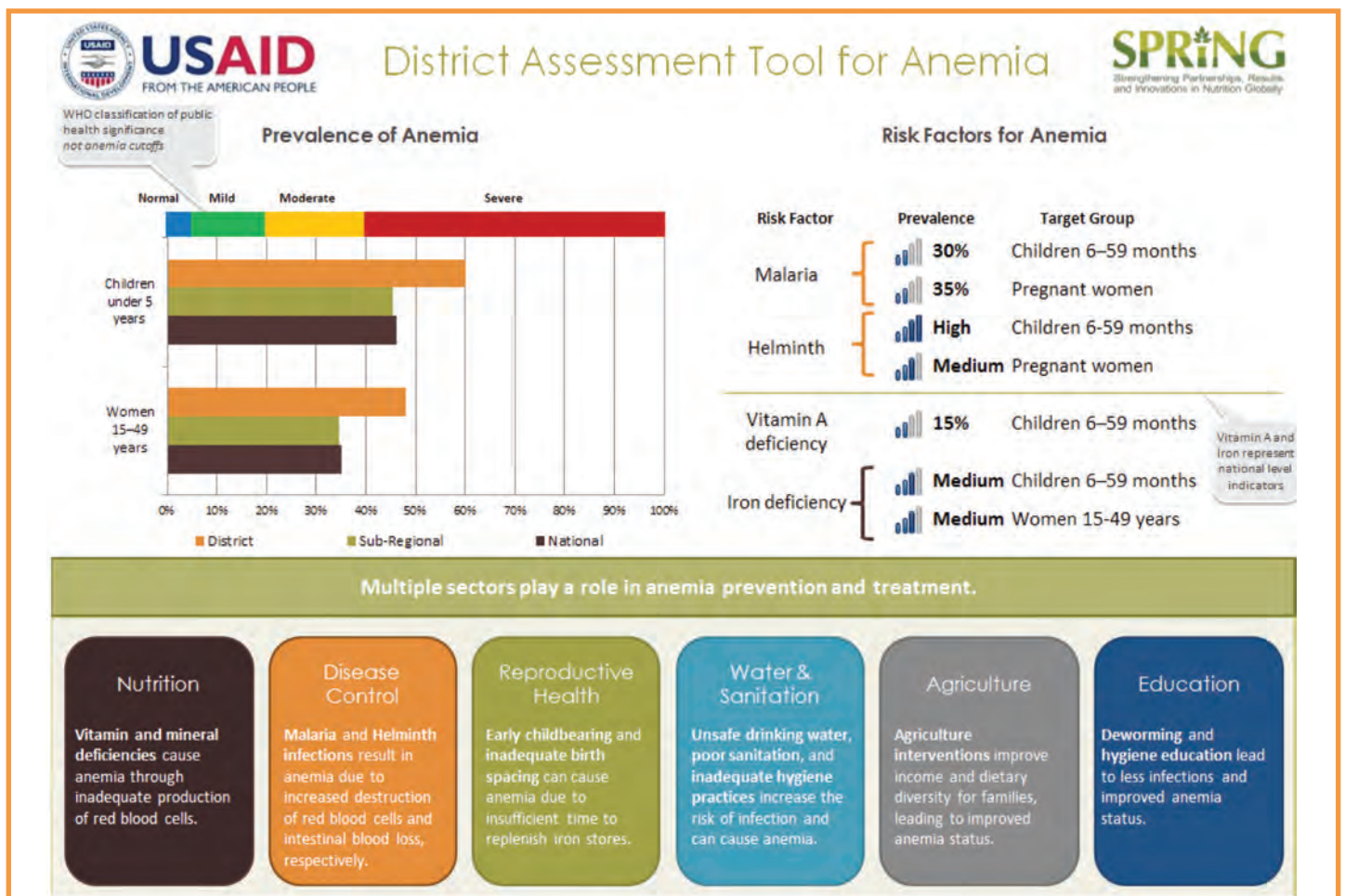
Conducting a landscape analysis to understand the anaemia situation in a specific context is the first step to improving anaemia reduction efforts in countries. In 2016, SPRING released the

guide 'Understanding Anaemia: Guidance for Conducting a Landscape Analysis'. This document presents a step-by-step guide to support government stakeholders and programme implementers in gathering and interpreting anaemia-related data in order to strengthen the use of evidence-based approaches to anaemia prevention and control. This guidance leads users through the process of conducting a landscape analysis for anaemia, providing references and examples to further explain each step. The tool can be accessed in an interactive, online format or downloaded as a PDF: <https://www.spring-nutrition.org/publications/tools/anaemia-landscape-analysis-tool>

District Assessment Tool for Anaemia

The District Assessment Tool for Anaemia (DATA) is a global, Microsoft Excel-based toolkit

that aims to increase awareness of anaemia among district-level actors and help them to prioritise activities to strengthen anaemia programming. The DATA tool identifies the local factors that contribute to anaemia, and helps participants to explore the opportunities and bottlenecks that exist for anaemia programmes in the district. DATA is completed during a two-day facilitated workshop, with active participation from district-level actors from multiple sectors, including health, water and sanitation, agriculture and education. Two accompanying resources, a DATA User's Guide and a DATA Facilitator's Guide, have been developed to guide users and workshop facilitators, respectively. The DATA package was piloted in three countries: Ghana, Uganda and Nepal. The DATA tool and guides are available online: <https://www.spring-nutrition.org/publications/tools/district-assessment-tool-anaemia-data>



Severe acute malnutrition bottleneck analysis tool

A range of surveys and tools is available to gain an understanding of nutrition situations, service delivery performance, bottlenecks and coverage, yet severe acute malnutrition (SAM) information systems are not routinely designed to indicate bottlenecks (obstacles) in effective service delivery coverage in a structured and logical manner.

The approach

The bottleneck-analysis (BNA) approach enables such an analysis and facilitates monitoring of bottlenecks in service delivery. This approach builds on health system conceptualisation of service coverage and is a systematic way to look at the main determinants of effective coverage for interventions in order to identify problem areas and act on them in a timely manner.

BNA involves:

- Identification of bottlenecks to service delivery, root causes and solutions;
- Activity planning for resolving bottlenecks and tracking corrective actions; and
- Monitoring bottlenecks to determine whether actions are effective and support service providers in adjusting actions as needed.

Implementation of the approach to date

To date, UNICEF has facilitated national BNA exer-

cises for SAM treatment services in countries including Kenya, Afghanistan, Pakistan, Tanzania, Somalia, Burkina Faso, Chad and Gambia. In these countries the BNA has provided a structured framework to support effective analysis of bottlenecks in service delivery and an appropriate response plan. The Coverage Monitoring Network also uses the approach to organise quantitative data during coverage assessments and to maintain bottleneck monitoring between assessments.

Further to this implementation, UNICEF, Action Against Hunger, the Coverage Monitoring Network and consultant David Doledec partnered to pilot a series of indicators under the BNA framework. The BNA approach and framework was well received by all pilot partners and there was interest in taking it forward, either at national level or by individual NGO actors, alongside other coverage methodologies. The data visualisation tool was recognised as useful to prompt programme improvement or advocate for change.

The approach is flexible and can be adapted to needs and capacities available; those actors with more resources can add additional investigative exercises to particular determinants as required. The BNA approach may not identify bottlenecks of which implementers are completely unaware, but does indicate the size of the problem. It focuses on the major challenges, their

root causes and the actions needed to overcome them. However, there are aspects of the approach that require further testing and strengthening.

After the initial exercise, whether at district or national level, the indicators (if based on routine data) can be inserted into existing monitoring and evaluation systems. They can then be automatically calculated alongside existing SAM treatment indicators, periodically complemented by more comprehensive coverage assessments.

Next steps

UNICEF HQ, with the support of Action Against Hunger and in collaboration with UNICEF Regional Offices, will continue to extend the BNA approach to additional countries in 2017. Specifically, the stakeholders will:

- Disseminate guidance on how to conduct a BNA exercise which can be used by SAM treatment implementers;
- Strengthen staff capacities on the approach (UNICEF, governments and NGOs) with an emphasis on context-specific practical guidance and advice;
- Increase the evidence base on the indicators, ability of the approach to reduce bottlenecks, and the use of the approach as a routine monitoring tool; and
- Provide support to SAM treatment implementers wishing to conduct a BNA exercise.

For more information, see: www.coverage-monitoring.org/wp-content/uploads/2015/12/BAA-12-08-2015.pdf

Compendium of Actions for Nutrition (CAN)



Nutrition has received considerable attention in recent years with the advent of the Scaling Up Nutrition (SUN) Movement in 2010, the launch of the United Nations Secretary-General's Zero Hunger Challenge in 2012, the Second International Conference on Nutrition (ICN2) in 2014 and a United Nations resolution in 2016 proclaiming 2016-2025 the UN Decade of Action on Nutrition. And the UN Food and Agriculture Organization 2030 Agenda for Sustainable Development includes 17 Sustainable Development Goals (SDGs), recognising improvements in nutrition as a key priority underpinning all SDGs. This has led to renewed

impetus for countries to develop or update multi-sector national nutrition policies, strategies and plans in an effort to scale up nutrition actions and address all forms of malnutrition.

As a result, there has been new demand from countries for a consolidated resource that national governments and other stakeholders can draw upon for multi-sector dialogue around policy, planning, programming, coordination, monitoring, evaluation and implementation of nutrition actions. In response, the UN network for SUN/REACH Secretariat, in consultation with UN partner agencies (FAO, IFAD, UNICEF, WFP and WHO) has developed a new Compendium of Actions for Nutrition (CAN).

The CAN was designed to provide an understanding of the breadth of actions needed to combat malnutrition, facilitate multi-sector dialogue and spur action at country level, particularly on nutrition-related policy and planning. While the compendium does not prescribe a specific set of nutrition actions, it does recognise that prioritisation is critical. Countries must prioritise, based on context, drawing on a robust situation analysis, available evidence and country priorities, in consultation with a range of stakeholders. The CAN is not intended to replace any existing technical guidance; rather, it builds on existing guidance developed by FAO, WFP, WHO and UNICEF and consolidates them into one document to promote a holistic approach to nutrition.

The intended audience is national authorities and supporting partners engaged in multi-sector nutrition governance processes (e.g. SUN government actors, REACH facilitators and SUN networks). Actors can use the CAN to foster participatory, multi-sector dialogue on nutrition-related policy formation. It provides a list of potential nutrition actions for reference by countries in developing context-specific policies and plans. The matrices of actions are presented in a concise and easy-to-use format, accessible to those without a technical nutrition background. The CAN may also be used to facilitate the development of nutrition mapping and information platforms.

Possible actions to combat malnutrition are categorised under Food, Agriculture and Healthy Diets; Maternal and Childcare; Health; Social Protection; and Multi-sector nutrition governance. There are 14 thematic areas, 43 actions, 132 sub-actions and over 200 enabling environment sub-actions. Classification of sub-actions into three evidence categories (synthesised evidence, primary studies and practice-based studies) clarifies the evidence base and identifies research gaps. Where evidence is limited, there are opportunities to advocate for further data to be generated, influencing the nutrition research agenda to strengthen evidence-based nutrition governance.

The CAN is now available in full and summary versions at www.reachpartnership.org/it/compendium-of-actions-for-nutrition

The Lancet/AUB Joint Commission on Syria: Health in Conflict

Summary of article¹

Location: Syria

What we know: The ongoing war in Syria has led to huge costs in terms of lives lost, with gross violations of international law and immense challenges in humanitarian response.

What this article adds: *The Lancet* and the American University of Beirut (AUB) have established a joint commission on *Syria: Health in Conflict* to describe and analyse the extreme humanitarian situation. The Commission will engage a regional and global network of researchers, practitioners and experts to build evidence for its recommendations. It looks to galvanise action all around a cause of shared humanity.

With the war in Syria reaching new levels of human suffering, *The Lancet* and the American University of Beirut (AUB) have established a joint commission on *Syria: Health in Conflict* to describe and analyse the extreme humanitarian situation. Through a lens of health and wellbeing, the initiative aims to assess issues of high mortality and morbidity; disruptions of home, family, settlement and environment; and extensive loss. The Commission's first task is identifying the costs and burden of war and examining the challenges of the international response to the crisis. From this, it will develop recommendations to address the unmet current and future health needs. These cover rebuilding and strengthening the global health response to political conflict, including lessons for future crisis.

Participants at the Commission's first meeting in Beirut, Lebanon in December, 2016, recognised the collective responsibility of the global health community to respond through research, collabora-

tion and advocacy on matters of life and death in conflict, as health professionals in an increasingly violent world.

That many of the events and facts in the Syria crisis are well-known – at least 250,000 people dead (recent estimates exceed 400,000), 13 million Syrians displaced, countless numbers of surviving wounded with amputations and severe burns – underscores the enormity of inaction. The past five years have seen gross violations of international law, such as chemical attacks on civilians, targeting of health facilities and health personnel, and blocking communities' access to food, water and medicine. These methods of war have gone unchallenged and there has been little coordinated action against the perpetrators of war crimes and atrocities. The Commission is a call from the global health community not to stand by but to have its voice heard.

The Syria story, best told by Syrians and other people from the region, is complex, with many

challenges of scope. Some topics, such as the local delivery of aid across conflict lines and transcontinental refugee flows, are global subjects backed by United Nations (UN) Security Council resolutions. Syria's conflict has thrown colonial-era geographical boundaries into question, posing challenges for health intervention. The Commission intends to address the conflict's complexity through engaging a regional and global network of researchers, practitioners and experts to build evidence for its recommendations.

The first report is due in March, 2018. However, due to the urgency of the situation, there will be a number of publications and events at global health meetings throughout 2017 to present interim findings, encourage dialogue and push for change, adding an advocacy dimension at the outset. Whether the Commission is able to achieve its objectives will depend on its ability to inspire and mobilise a global community of researchers, practitioners and policy makers around a cause of shared humanity. Syria is described as the mirror in which the world faces the grim reality of its dismal failure at all levels of politics, law, governance and solidarity. The Commission's intention is to inspire health professionals to call on countries to recommit to protecting humanity from the twin scourges of war and indifference.

The Commission calls on the international community to submit evidence and research to inform the inquiry. Please submit manuscripts through *The Lancet's* online submission system (ees.elsevier.com/TheLancet) and state in your cover letter that your submission is in response to the Commission's call for papers.

For more information, contact Samer Jabbour: Faculty of Health Sciences, American University of Beirut, PO Box 11-0236, Riad El Solh 1107 2020, Beirut, Lebanon, email: j22@aub.edu.lb

¹ *The Lancet*-American University of Beirut Commission on Syria: A new role for global health in conflict and a call for papers. www.thelancet.com Vol 388 December 17/24/31, 2016.

Launch of new SUN Movement strategy and roadmap

On 21st September, the new SUN Movement Strategy and Roadmap for 2016-2020 was launched, marking the second five year phase of the movement. The new strategy and roadmap is the product of a consultative process that spanned SUN countries, multiple United Nations (UN) and donor agencies, along with hundreds of international and national non-government organisations and businesses. It focuses on what countries have identified is needed to transform the momentum gained in the first

phase of the Movement into tangible results. It retains its primary focus on the critical 1,000-day window of opportunity from pregnancy to second birthday. Several tools will help track progress and in 2019, a second independent evaluation to reassess the Movement's relevance, efficiency and effectiveness is planned.

To access the new Strategy and Roadmap, visit: www.scalingupnutrition.org/about-sun/the-sun-movement-strategy/



Global Humanitarian Response 2017

Summary of overview ⁱ



Iraqi families displaced by fighting in Shora, 25 km south of Mosul, arriving at an Iraqi army checkpoint on the northern outskirts of Qayyarah.

UNHCR/Ivor Prickett

A recent global humanitarian overview by the United Nations Office for the Coordination of Humanitarian Affairs (UN-OCHA) reports that, for 2017, humanitarian partners will require \$22.2 billion to meet the needs of 92.8 million people in 33 countries (an increase from \$20.1 billion for 87.6 million people in 37 countries in 2016). This is in stark contrast to the \$2.7 billion called for in the first six inter-agency humanitarian appeals launched in 1992. The last quarter century has seen an overwhelming shift in frequency, scale and magnitude of humanitarian emergencies. Crises in Afghanistan, Burundi, the Democratic Republic of Congo (DRC), Somalia and Sudan have necessitated appeals almost every year. This has also been the case since the turn of the millennium for the Central African Republic (CAR), Chad, Iraq and the occupied Palestinian territory. The report includes a snapshot of the global humanitarian response for 2017, including country response plans, numbers in need and numbers predicted to receive aid.

These countries and many others are immersed in conflict and urgently require a multidimensional response. In Afghanistan, for example, needs are increasing due to massive displacement and protracted conflict. In Burundi, the political crisis continues to deepen and the number of people in need of urgent support has tripled to three million. About 1.2 million people, 80% of them women and children, have fled from South Sudan – the largest refugee movement in Africa. Aid organisations in Syria expect protection and humanitarian needs to grow exponentially if hostilities continue and no political solution is found. In the Lake Chad Basin, Boko Haram violence is causing instability and insecurity and there is little evidence that a political solution is forthcoming. Humanitarian access is severely constrained and has grown in complexity in countries including Iraq, South Sudan, Syria and Yemen. Mines, explosive remnants of war and improvised explosive devices further hamper humanitarian work and threaten the lives of those living in conflict-affected regions.

way it works in order to adapt to the changing operational context to meet the needs of affected people. Six countries will develop multi-year response plans in 2017 to allow partners to address needs arising from protracted crises more effectively. Multi-year planning and the Humanitarian Response Plans are designed to increase greater collective impact and accountability. The report includes summaries of 2017 Response Plans for 25 countries, as well as Refugee Response Plans for four regions.

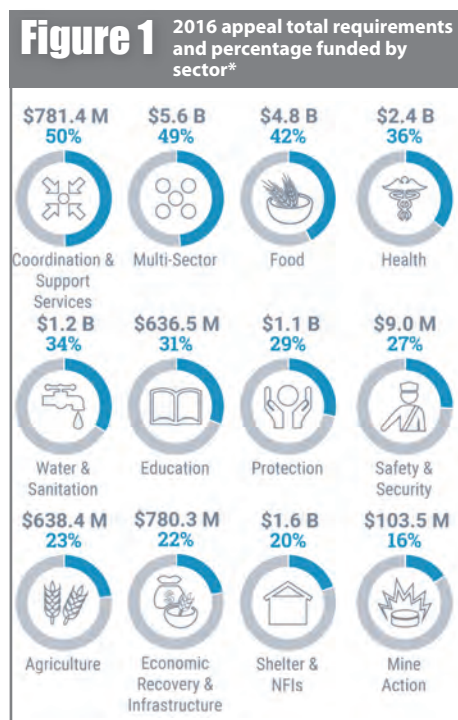
United Nations agencies and partners are relying especially on non-earmarked and multi-year donor support to ensure timely response. Low, delayed and unpredictable funding with strict allocation criteria has serious consequences. In Ukraine, for example, inadequate funding has resulted in major delays, interruptions and discontinuation of critical activities such as mobile health clinics and services in hard-to-reach areas. Maintaining transport links for humanitarian relief for vulnerable people in Mali was seriously challenging in 2016. In Yemen, underfunding, outstanding pledges and bureaucratic impediments limit the reach of humanitarian partners. If sufficient funds are not secured for DRC, 4.3 million people will face heightened risk of morbidity or death due to malnutrition, food shortages and epidemics. Section 3 of the report highlights tools for supporting critical funding, such as the Central Emergency Response Fund (CERF) and the Financial Tracking System for tracking humanitarian aid flows.

The report presents a breakdown of the 2016 overall global humanitarian funding (\$20.4 billion) into percentages funded by sector (see Figure 1). Although nutrition is not presented separately, food insecurity and malnutrition will continue to drive humanitarian need.

Across the Sahel, hundreds of thousands of households live in unacceptably precarious conditions. Food insecurity, acute malnutrition, disease and disasters are a reality for millions. Conflict in the region and in bordering countries has uprooted many people from their homes and livelihoods and forced them into dependency on external assistance. Where chronic vulnerabilities drive humanitarian needs, humanitarians are collaborating with development actors to bring about a “shift from delivering aid to ending needs”. In 2017, transitional Humanitarian Action Plans for Burkina Faso, Mauritania and Senegal will be strategically aligned with resilience and development frameworks.

At the World Humanitarian Summit, the humanitarian community resolved to change the

In 2017, urgent humanitarian assistance will be required in Ethiopia, Somalia, Haiti and Southern Africa due to the El Niño event and its successor, La Niña. In Southern Africa, El Niño caused a 9.3 million-ton cereal production deficit and led to severe water shortages. Here and elsewhere, failure to act on the alarming crises outlined in this Global Humanitarian Overview could lead to a far wider humanitarian crisis, with devastating repercussions to life, livelihoods and security.



*Includes 2.1 billion not yet assigned to a sector

ⁱ Global Humanitarian Overview 2017 (2016). United Nations Office for the Coordination of Humanitarian Affairs (UN-OCHA). www.humanitarianresponse.info/en/programme-cycle/space/document/global-humanitarian-overview-2017-consolidated-appeal-support-people

Operationalising multi-sectoral coordination and collaboration for improved nutrition

Summary of report¹

Reducing undernutrition requires a commitment from multiple sectors, yet there is little documentation on how to collaborate across sectors to reach global goals. The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project investigated approaches to multi-sectoral collaboration for nutrition through a three-country assessment and literature review. A recent report highlights lessons learned by USAID and its implementing partners, and provides a series of recommendations to guide the design, implementation and monitoring of future collaborations.

Building on earlier research on cross-sector working in Senegal, Nepal and Burkina Faso, SPRING worked with three Feed the Future USAID Missions and their implementing partners in Guatemala, Bangladesh and Rwanda to strengthen their vision, plans and approaches for coordination and collaboration around nutrition. Researchers used document reviews, workshops and more than 50 interviews to identify the challenges and opportunities faced by countries in encouraging stakeholders to work together. Despite being at different stages and using various approaches, the countries shared similar obstacles in implementing structures, processes and practices. The report provides both country-specific recommendations and lessons that can be applied to other countries' efforts to strengthen multi-sectoral collaboration to improve nutrition outcomes. 'Coordination', 'collaboration' and 'integration' are used interchangeably, but this report used the term collaboration throughout, with the understanding that coordination is inherent in the term.

SPRING identified six common multi-sectoral collaboration strategies across the countries related to leadership, strategy, communication, accountability, documentation and reporting that also align with key stages in the programme development and implementation cycle.

1. Prioritise collaboration to address nutrition

Collaboration should be inclusive, but leaders have an important role in overseeing the process and are an integral part of an initiative's success. All three countries had champions within the Mission who took the lead in developing the approach. In Bangladesh, one USAID staff member created the working group and documented collaboration efforts. In Guatemala, one initial leader established the Western Highlands Integrated Programme (WHIP), set up monthly meetings and documentation so that only a small amount of operational guidance was needed from USAID.

Rwanda's Mission Director prioritised nutrition by driving the creation of the Community Health and Improved Nutrition (CHAIN) project, so nutrition and community health partners could work together for greater effect. However, implementing partners reported that they do not always understand where they fit in the 'big picture' and, instead, focus on their separate work plans; USAID has an important role in helping the partners see how they can better connect to other activities.

2. Develop a practical strategy

All three countries were struggling to develop a strategy that defined roles and responsibilities across participants, including a system for monitoring and feedback. Observations across the countries suggest that a collaboration strategy for nutrition should be inclusive, understandable, measurable and responsive.

- *A strategy should be inclusive, encouraging participation from all stakeholders to generate consensus from the beginning and foster meaningful engagement.*
In Guatemala, the WHIP held a workshop to finalise a two-year action plan during which participants agreed on common language to include in the strategy, vision and objectives, and defined the roles and responsibilities of the various stakeholders. Convening people at the outset also generated support for the design and implementation of collaboration across and among activities.
- *A strategy should define terminology and expectations.*
Confusion over terminology for coordination, collaboration, cooperation and integration was reflected in differing perceptions of how various activities were working together in Guatemala, and what stakeholders believed they were expected to do.
- *A strategy should impose a time limit and result in a realistic outcome(s).*
An ideal collaboration strategy includes a combination of easy wins to sustain momentum, as well as more ambitious, long-term outcomes. CHAIN partners in Rwanda identified a number of short-term goals, including increased adaptation and use of each other's materials and messages.
- *A strategy should include learning objectives and an understanding of the context in which collaboration is being promoted to guide current and future approaches.*
Interviewees across the countries stated that they felt as though new activities had been designed separately from existing portfolios, and without a sound assessment

of where the gaps were and how the new partners would best fit. By incorporating context assessment and evidence from past evaluations, USAID and other designers may develop collaboration strategies that capitalise on partners' combined strengths.

3. Communicate the strategy's goals and expectations at all levels

Communication at the national level between chiefs of party and Mission staff in the three countries was strong and regular meetings well attended. District-level interviews in Bangladesh and Rwanda revealed that several stakeholders had not heard about initiatives to collaborate, despite structured meetings between senior staff. Many interviewees across all the countries are often unaware of the collaboration challenges that staff in other locations face, suggesting weak communication between central and district levels; there were no formal structures for communicating the purpose of Bangladesh's Agriculture-Nutrition Linkages Group and Rwanda's CHAIN objectives. In contrast, the monthly departmental meetings in Guatemala (there are WHIP coordinating bodies in five geographic departments) are a venue for decentralized collaboration with department-level staff indicating a high level of understanding about what other stakeholders were doing.

4. Hold all stakeholders accountable for achieving the strategy

All stakeholders need clear, documented roles and responsibilities to facilitate commitment and promote effective collaboration.

- *Ensure that collaboration responsibilities are central to everyone's work*
Collaboration requires resources, time, and committed staff to initiate and maintain efforts over time. USAID Rwanda has initiated structures to manage the implementation of CHAIN, which has a project manager who oversees the coordination of the project management team (PMT) and all the activities. Recently, collaboration responsibilities have been included in job descriptions and incorporated in newly awarded activities.
- *Provide autonomy*
In Guatemala, each departmental WHIP committee has the power to institute its own plans which has empowered some committees to take the initiative. In one department, the committee selected a pilot community where a number of partners work, and created a joint one-year work plan, working closely to collaboratively implement project interventions.

5. Share learning & adjust during implementation

A common finding in all three USAID Missions was that partners are working on similar activities simultaneously (e.g., duplicative evalua-

¹ SPRING. 2016. Operationalizing Multi-sectoral Coordination and Collaboration for Improved Nutrition: Recommendations from an in-depth assessment of three countries' experiences. Arlington VA: Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING).

tions, separate social and behavior change materials for nutrition, repeated or overlapping mapping exercises and tools), often duplicating efforts and not working in a cost-effective way. In Rwanda, stakeholders decided to form a technical working group to share tools that could be adjusted to serve others. In Guatemala, the Mission made deliberate efforts to coordinate the monitoring and evaluation processes across partners. Similarly, in Bangladesh, one activity is responsible for organising indicators across the activities.

6. Report on collaboration efforts

Many of the partners in all three countries did not have specific deliverables, objectives, or metrics related to collaboration, resulting in a conflict between their contracts and the request from their donor to collaborate. The discrepancy between mandatory activity targets and a request for collaboration leaves imple-

menters reluctant to allocate time and resources to collaboration. The Missions agreed that it was important to recognise stakeholders' work on collaboration and requested assistance in monitoring their efforts. One opportunity for providing information that would ensure they achieve their collaboration goals is through evaluating joint trainings, common across all countries. The trainings themselves (number of trainings and people trained) are sometimes measured, but rarely are attempts made to measure additional outcomes. Certain benefits of collaboration, like participant satisfaction, are infrequently captured in traditional monitoring systems that focus on quantitative outcomes, but combining qualitative and quantitative methods may more effectively capture the dynamic nature of collaboration.

Conclusion

While collaboration strategies, goals, and mod-

els vary, they often follow a similar life cycle that can be systematically designed, implemented and monitored. The authors suggest that incorporating the recommendations highlighted by this assessment may lead to more successful and sustained collaboration for nutrition. However, well-designed indicators measuring the process and outcomes of collaboration still need to be developed to demonstrate the level of impact that is possible through multi-sectoral collaboration for nutrition.

The authors suggest that incorporating the recommendations highlighted by this assessment may lead to more successful and sustained collaboration for nutrition. However, well-designed indicators measuring the process and outcomes of collaboration still need to be developed to demonstrate the level of impact that is possible through multi-sectoral collaboration for nutrition.



En-net update

By Tamsin Walters, en-net moderator

Over the past three months (Nov 2016 to Jan 2017), 47 questions have been posted on en-net, generating 81 responses. The forum areas for Prevention and management of severe acute malnutrition and Assessment generated most discussions. Eleven vacancy announcements have been posted, which have accumulated 3,390 views on the website.

SAM treatment topics have included use of micronutrient supplementation (www.en-net.org/question/2785.aspx), vitamin A supplementation (www.en-net.org/question/2761.aspx), and deworming in severely malnourished children (www.en-net.org/question/2753.aspx); the latter has been the subject of a number of recent reviews and research which we plan to feature in Field Exchange 55.

In the assessment forum, one contributor sought reasons for higher prevalence of undernutrition in boys than girls observed in Afghanistan; a finding shared by a second contributor from Nepal (www.en-net.org/question/2773). A gap highlighted in one exchange regards mid upper arm circumference (MUAC) cut-offs in pregnant women and at what prevalence does MUAC <230mm become of public health concern. Contributors reflected that while there are plenty of studies showing that short mothers have more difficult labour with higher maternal and perinatal mortality, the effect of nutritional supplementation in these low MUAC women has never been clearly shown (www.en-net.org/question/2745.aspx).

A post in the Infant and young child feeding

interventions forum area, raising concerns regarding a report recommending to make infant formula available for routine distribution in camps for refugees and migrants in Greece, prompted discussions and was picked up by UNICEF in Greece. The matter was taken to the Health working group in Greece, chaired by the Ministry of Health, and the report recommendation subsequently removed in keeping with the country joint statement and operational guidance, which accommodates needs-based, targeted infant formula use.

A December internal review found that 70% of French en-net (www.fr.en-net.org) users over the last six months were from French speaking Scaling Up Nutrition (SUN) countries. The top 10 countries using French en-net are:

- | | |
|------------------|------------------------|
| 1. France (20%) | 6. Congo (DRC) (5%) |
| 2. Senegal (7%) | 7. United Kingdom (4%) |
| 3. Cameroon (6%) | 8. Haiti (4%) |
| 4. Niger (5%) | 9. Belgium (2%) |
| 5. Mali (5%) | 10. Burkina Faso (2%) |

The en-net team has been working to assess the quality of translation and improve the en-net mirror French site over the past few months. Due to ongoing challenges with the automatic translation platform resulting in incomprehensibility of some posts, we are now reviewing every post and correcting the French translation systematically. This means that those subscribed to the French site will receive immediate notification of new posts in automatically-translated French, but within 1-2 days they can visit the website to see the corrected version. We hope this system will lead to im-

provements in user experience and make the site a more valuable resource for French speakers. As usual, we very much welcome feedback on the site and are grateful for any suggestions to make it increasingly accessible and useful for French speakers. All feedback is welcome to post@en-net.org.

Finally, Action Contre la Faim (ACF) recently conducted a study on whether ready to use therapeutic food (RUTF) should be added on the World Health Organisation's (WHO) Essential Medicines list (EML), which concluded that this would be an important step to advance SAM treatment coverage globally. The study is summarised in this edition of Field Exchange. ACF announced their application to the WHO Expert Committee on the Selection and Use of Essential Medicines for RUTF to be accepted to the EML on en-net in early February, and requested the en-net community to get involved through writing letters in support by 24 February 2017. This announcement created a vibrant discussion on en-net; a summary of this exchange is included as a postscript to the ACF article.

To join any discussion on en-net, share your experience or post a question, visit www.en-net.org.uk or www.fr.en-net.org

Contributions

Jodine Chase, Yolande C., Karleen Gribble, Patti Rundall, Adriana Zarrelli, Andre Briend, Mark Myatt, Elisa Pozzi, Ahmad Nawid, Giorgio Cortassa, Mahesh Sarki, Shima Mansor, Andre Briend, Yusuf Abdi Lare, Hamed Abdu, Mushtaq Hassan, Joseph Iotesire, Jessica Bourdaire

NUTRITION EXCHANGE

Issue 7 out now



This seventh issue of Nutrition Exchange (NEX), was released in January 2017, and is available in English, French, Arabic and Spanish. It introduces an exciting new phase in the ENN's development, as NEX is now published twice a year (January and July). This has been made possible by DFID funding to ENN to provide knowledge management (KM) services to the SUN Movement. For Issue 7, ENN's team of regional KM specialists (RKMS) have worked with national actors to support the development of eight original articles focusing on current nutrition issues in East and West Africa and Asia. An article from

Tanzania describes the advocacy work by the local civil society network, PANITA (Partnership for Nutrition in Tanzania), with the country's politicians to raise the profile of nutrition, and an interview with Senegal's SUN Focal Point describes success in increasing the national nutrition budget. Government initiatives at a national level are also captured, with articles describing the passage of Kenya's Food and Nutri-

tion Security Bill; Odisha state's efforts to address anaemia through scaling up fortified rice in school meals; the experience of REACH in strengthening the SUN Movement in Burkina Faso; and the launch of SUN business networks in Nigeria and Niger.

To read these and more, visit www.ennonline.net/nex

The NEX editors are now looking for articles for NEX 8, to be published in July 2017. Visit 'write for NEX' at www.ennonline.net/nex/writefornex or email the editors at nutritionexchange@ennonline.net – they are keen to hear about your experiences of scaling up nutrition at national, sub national and district level.

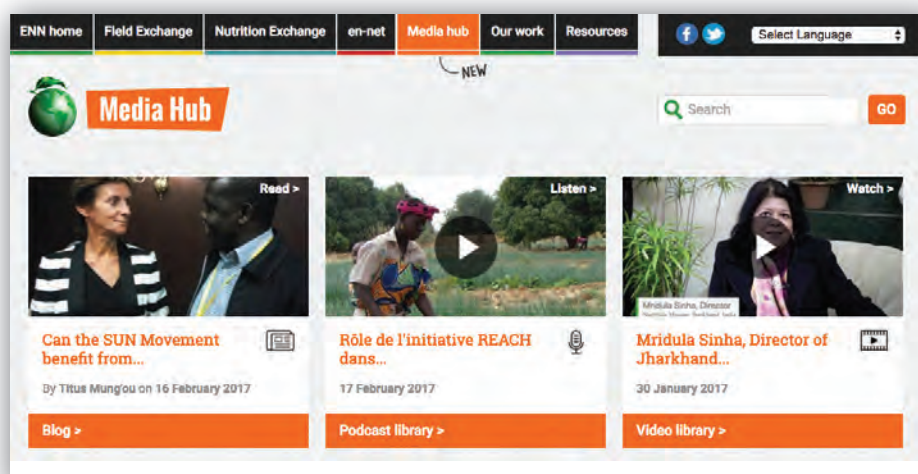
Media Hub

Welcome to the ENN's new Media Hub

In January 2017, ENN launched a new Media Hub – a place where you can read blog posts from the ENN SUN team and other ENN colleagues, or follow our podcast and video channels.

Through ENN's DFID funded knowledge management (KM) project, providing support to the SUN Movement (2015-2020), we have identified the need to be more innovative about how we capture and share learning: a welcome blog by Tui Swinnen, ENN Global KM Coordinator, nicely shares the rationale for this development. The Media Hub will build on what we already do (providing supplementary content for Field Exchange and Nutrition Exchange), will provide regular updates on our work, and will serve as a repository for experiences and learning captured in SUN countries in a range of different media (i.e. videos, blog posts and podcasts). The en-net forum remains the go to site for technical questions and is fully integrated into the hub. Content is available in English and French.

Specific to Field Exchange 54, the MediaHub features a podcast by Field Exchange editors, Jeremy Shoham and Marie McGrath; and inter-



views with two of our contributing authors to the edition. Charulatha Banerjee, ENN's regional KM coordinator based in India, interviews Stanley Chitekwe, UNICEF, regarding his experiences of multi-sectoral nutrition programming in Nepal. Meanwhile, Youssouf Ambarka, ENN's regional KM coordinator based in Senegal, interviews Alain Georges Tchamba, Nutrition coordinator at Cooperazione Internazionale (COOPI), regarding the experiences shared in

his field article on scaling up severe acute malnutrition services in the Democratic Republic of the Congo.

Visit the MediaHub via ENN's home page (www.ennonline.net) or directly at: <http://www.ennonline.net/mediahub>

Welcome to the Media Hub:
www.ennonline.net/mediahub/thewhereforeofthemediahub



Ready-to-use therapeutic food and the WHO list of essential medicines

By Aurélie du Châtelet, Anne-Dominique Israel, Elise Rodriguez, Wisdom Dube, Laetitia Battisti, Magali Garcia, Coline Morin and Natalie Sessions

Aurélie du Châtelet is Advocacy Advisor at Action Against Hunger. This article was compiled by Aurélie with the support of the co-authors listed.

Anne-Dominique Israel is Senior Nutrition and Health Advisor at Action Against Hunger.

Elise Rodriguez is Head of Hunger Advocacy at ACF.

Wisdom Dube is Nutrition Consultant, Zimbabwe.

Laetitia Battisti is Advocacy Officer at Action Against Hunger in Sierra Leone.

Magali Garcia is Advocacy Coordinator at Action Against Hunger in Niger.

Coline Morin is Nutrition and Health Advocacy Intern at Action Against Hunger.

Natalie Sessions is the CMAM Forum Coordinator.

Action Against Hunger has submitted an application to the WHO Expert Committee on the Selection and Use of Essential Medicines for RUTF to be accepted as an item on the Model List of Essential Medicines (EML/EMLc). This application builds on a stakeholder consultation and recent report published by Action Against Hunger and the CMAM Forum that reviewed the inclusion of RUTF on the WHO EML and country-level EMLs. This article summarises the case made by ACF. The WHO Expert Committee has accepted comments on the application from individuals, organisations and governments submitted to 24 February 2017. Discussion on en-net in February, prompted by the application and supporting report, are summarised in this edition of Field Exchange. We encourage readers to continue to contribute to this discussion on en-net or in letters to Field Exchange (Eds).

Background

Severe acute malnutrition (SAM) affects more than 16.2 million children each year (Unicef, WHO, World Bank, 2014), yet only 3.2 million have access to treatment (Unicef, 2015 [2]). Scale-up of high-impact, proven treatments is needed to improve coverage and access across high-burden countries. One critical barrier to expanding SAM treatment services is the acceptance, accessibility and utilisation of ready-to-use therapeutic Foods (RUTF). In some countries and contexts, RUTF is still not fully accepted by community members, while other countries face problems with procurement, storage and supply chain management which impact on availability and use (Unicef, 2009).

One proposed method for improving RUTF access is including the product as a miscellaneous

item on the Essential Medicines List (EML) of WHO and of high-burden countries. This is “a list of minimum medicine needs for a basic health-care system, listing the most efficacious, safe and cost-effective medicines for priority conditions” (Aitken, 2015). It provides a guide to countries on medicines to prioritise for national procurement; national health and nutrition decision-makers tend to rely on the EML as a guide for determining their own national medicine and commodity lists (Aitken, 2015). Thus, placing RUTF on the EML could potentially assist in prioritising the procurement of RUTF and alleviate some of the distribution and supply chain issues.

Discussions on whether RUTF should be placed on the WHO EML began in 2009 and at a conference on government experiences of CMAM scale-up in 2011, the question of adding RUTF

to national EMLs was identified as critical (ENN, 2012). General consensus remained that placing RUTF on the WHO and national lists of essential medicines could be a positive step, but closer investigation was needed.

This prompted an analysis by Action Against Hunger (ACF) on the potential inclusion of RUTF on the WHO EML and national medicines lists. This involved a literature review, two country case studies (Zimbabwe and Nigeria), a stakeholder mapping exercise, and interviews with key informants¹. This article summarises some of the arguments for and against adding RUTF to the EML and suggests next steps. Based on the findings of this study, Action Against Hunger has filed an application for RUTF to be added to the WHO EML².

What are the arguments for placing RUTF on the EML?

There is a substantial body of observational and programmatic data documenting the effectiveness of RUTF

The use of RUTF to treat uncomplicated cases of SAM in children aged 6-59 months is well estab-

¹ The following stakeholders were interviewed: Alison Fleet and Thomas Sorensen (UNICEF), Zita Weise and Hala Boukerdenna (WHO), Hanane Bouzambou and Charlotte Bienfait (formerly WFP), Steve Collins (Valid International), André Briand (independent, formerly IRD & WHO), Odile Caron (MSF), Jane Badham (HKI), Patti Rundall (IBFAN), Stefano Prato (SID), Thomas Couaillet (Nutriset), Anne-Dominique Israël, Rachel Lozano and Danka Pantchova (ACF)

² The full application report is available on the ACF website under the publications section.

lished and has been the recommended treatment approach for more than a decade. The 2007 Joint Statement by WHO, WFP, UNICEF and the UN-SCN endorsed the use of a community-based approach, using RUTF to treat SAM (Maleta & Amadi, 2014). Additionally, the 2013 WHO guideline update for the management of SAM recommended using an outpatient model to treat children diagnosed with SAM who have passed an appetite test and are clinically well (WHO, 2013). Much grey literature and programmatic evidence points to the effectiveness of RUTF. A review conducted in 2006 noted that RUTF is effective in supporting rapid weight gain and safe to use in a community setting; low mortality rates and rapid recovery rates were reported comparable or higher than those achieved in previous inpatient treatment models (Prudhon et al, 2000).

Including RUTF on the EML would assist in prioritising SAM at a global and national level

The WHO EML is a critical tool to identify priority medicines of public health importance. The WHO EML is a guide, not a global standard. However, implicit in adding medicines and items to the list is the imperative that countries should make them available and affordable. In practice, the WHO EML is used as the foundation of many national essential medicine lists (Kaiser, 2006). In addition, high-burden countries often (but not systematically) allocate budgets by priority according to the drugs listed in their EML; thus the integration of RUTF on the list could create political drive to prioritise SAM treatment.

A report by UNICEF in 2015 noted that the inclusion of nutritional products on national EMLs is an important mechanism for fostering integration into supply chains and ensuring quality assurance, and recommended that UNICEF country offices should support governments to integrate all nutrition products for SAM treatment into National EMLs (UNICEF, 2015). Many interviewees assumed EML RUTF listing could help make the product more affordable and available; this has been demonstrated in the past where improved availability of TB drugs were a result of their inclusion in the 2015 amendments to the list (Saez, 2015). In addition, medicines on the EML are prioritised by donors during emergencies. Most key informants suggested it could impact on political decision-making at a national level as it would contribute to greater awareness and prioritisation of SAM treatment at health facility and community levels. This could lead to more resources being allocated to treatment.

Inclusion of RUTF on the EML would lead to improved integration of nutrition within health systems

The potential to support integration is one of the strongest arguments in favour of adding RUTF to the EML. Most key informants agreed that inclusion on the EML would lead to better integration of SAM treatment within health systems, avoid vertical, parallel programmes being created and empower more national authorities to ensure the product is available. Supply chains should not be separated within a health system, especially in light of a health system-strengthening approach.

Government ownership and accountability is critical. This requires that RUTF be integrated within national distribution systems. Additionally, including RUTF on the essential medicines list (and/or commodities list; see below) allows easier integration into national supply systems (easier clearance of supplies at port, government storage at central medical stores, and government-led distribution and logistics). Some countries like Burkina Faso have common lists of essential medicines and commodities that include a broader range of items, such as gloves, syringes, etc.

RUTF on the EML would result in better management of SAM treatment programmes

EMLs can influence the provision of medicines and result in increased availability of essential medicines compared to non-essential medicines, particularly in low and middle-income countries (Yaser et al, 2014). Thus, placing RUTF on the EML could lead to fewer stock-outs as stock management and distribution improves. In Zimbabwe, it was noted that there was better integration of nutrition products into the national distribution system after adding the product to the national EML, as well as improved data availability of stocks and delivery. Distribution is now overseen by the National Pharmacy, although RUTF is stored separately from other medicines. RUTF is now included in the national forecasting and quantification exercise. This exercise allows the identification of requirements, funding gaps and supply forecasting. The current system provides supply-chain management data routinely, which was not the case prior to integration into the national supply chain. The routine data provides reports on stock status, stock-outs and delivery coverage. It helps to reduce the potential for RUTF stock-outs at a health-facility level.

Increased financial resources would be available for RUTF and potentially decrease overall cost

The addition of RUTF on EMLs opens doors for treatment, as governments would be required to allocate adequate budget for the purchase of RUTF. Most importantly, the inclusion of RUTF on a national supplies list would likely ensure there is dedicated national health budget for community programmes that use RUTF. It can also contribute to decreasing the cost of RUTF, which would then allow countries to buy more supplies with the same amount of money. This is based on assumptions that this commitment and demand would stimulate local production of RUTF and that harmonisation of standards could lead to a larger scale of production for bigger producers, decreasing unit costs. However, the cost of local production has been shown to be equivalent to, or higher than, international production standards. However, even if RUTF scale-up is stimulated, significant impact on the cost of RUTF is not clear due to the large fixed cost of raw materials (Nutriset). Thus, more evidence is required.

Inclusion on the EML would assist in changing perceptions around RUTF

In Zimbabwe, EML inclusion led to RUTF being seen more as a therapeutic product. Health workers interviewed reflected that it changed their per-

ception and pushed them to handle RUTF as a treatment rather than merely food. It contributed to raising awareness of treatment, as well as of undernutrition in general, motivating staff. In Tanzania, with RUTF distribution through pharmacies, RUTF slowly started to be seen as a medicine, which helped to control its misuse. Again, its integration into the EML “protects” RUTF from being seen simply as food.

Adding RUTF to the EML is complementary to efforts to have it included on the Codex list

Today there is no official standard for RUTF, which leaves a large gap in the definition and framework of the product. Since 2014, UNICEF has been developing a guideline for placing RUTF on the Codex Alimentarius (Fleet, 2015) as a food for specific medicinal needs. The Codex aims to set regulatory standards to ensure safe and good foods for international trade (Fleet, 2015). It is felt that Codex classification will assist in ensuring the safety of the global supply of RUTF, improve importing and exporting procedures, and build regulatory capacity (Fleet, 2015). While including RUTF on the EML and Codex are independent processes, key informants felt that the processes were complementary. The Codex aims to set standards for quality production and countries have to adopt Codex standards. The WHO EML is a list of safe priority medicines; countries do not have to adopt the WHO EML products on their national EML. Ensuring that RUTF is placed on both the EML and the Codex will assist in improving safety, quality and supply.

What are the arguments against placing RUTF on the EML?

Classifying RUTF as a medicine can be problematic in some countries

Classification as a medicine could imply that the product is a medicine. The challenge is that the recognition of the product as a medicine requires it to go through stringent quality assurance measures which would likely dissuade local producers. Hence, considering RUTF as a ‘commodity’ may be more beneficial (ENN, 2012). RUTF should fall into the general/non-medical category of the WHO EML, labelled ‘miscellaneous items’, which also includes sterilised water. Another risk is that adding RUTF to the WHO EML could be seen as a way to promote a product based-approach to SAM, undermining or distracting from other preventive/mitigating interventions, such as the promotion of breastfeeding. However, treatment and prevention of SAM should be seen as two sides of the same coin.

It may lead to the promotion of other products

The addition of RUTF on the EML could open the door for the promotion of other products on the EML, such as ready-to-use supplementary food (RUSF). However, on examining the EML of countries that had added RUTF recently, none were found to have added RUSF. If RUTF is added to WHO EML and national EML, this risk should be flagged with emphasis that the recommendation only relates to RUTF.

Low capacity of national health systems and pharmacies would be further stretched

Countries which would likely benefit the most from RUTF inclusion on their national EML often experience humanitarian emergencies and have low capacity to implement such measures, as well as low-tech capacity of pharmacies. There is a concern that adding additional services would only serve to further weaken the pharmacies and the health systems in general; this highlights the need for capacity strengthening.

Risk of potential conflicts of interest

The demand for RUTF is expected to increase as more countries add RUTF to their EML. The private sector will benefit from a new 'market'

and become interested in a matter that has been so far a niche market (Persistent Market Research, 2016). The future influence of the private sector will need to be carefully monitored by states and NGOs/CSOs.

Conclusion and way forward

ACF concludes that there is a strong value-add for RUTF inclusion on the EML as a therapeutic food, under the category "miscellaneous item", and with quality assurance criteria of RUTF to be set by the Codex. There is overwhelming programmatic and observational evidence on the effectiveness of the product and its many positive benefits.

Adding RUTF to the WHO EML can act as an initial catalyst in scale-up. Global action could seek to influence countries to integrate the product

into national EMLs, ultimately leading to increased prioritisation of SAM treatment with RUTF, increased budget allocation and improved integration within the health system and supply chain. These are critical factors to increase the availability and access to SAM treatment.

Given this, Action Against Hunger has submitted an application to add RUTF to the WHO EML and has sought support from individuals and organisations for the application. The WHO Expert Committee on the Selection and Use of Essential Medicines will meet from 27 to 31 March 2017.

For more information, contact Aurélie du Châtelet, email: aduchatelet@actioncontre-lafaim.org

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Postscript

By Tamsin Walters, en-net moderator

Contributions on en-net from Sameh Al-Awlaqi, Dr. Charulatha Banerjee, Paul Binns, Bindi Borg, Jessica Bourdaire, Chris, Suzanne Fuhrman, Michael B. Krawinkel, Paul Mabany, Emily Mates, Kalufeny Ngengele, Sonja Read, Yara Sfeir.

ACF announced on en-net (<http://www.en-net.org/question/2799.aspx>) their application to the WHO Expert Committee on the Selection and Use of Essential Medicines for RUTF to be accepted to the EML and requested the en-net community to get involved through writing letters in support by 24 February 2017. This announcement created a vibrant discussion on en-net (<http://www.en-net.org/question/2799.aspx>). Whilst many people support the initiative, several important concerns were raised. These include:

Whether the RUTF composition proposed in the submission would be binding and what might this mean for local production of RUTF and the use of different recipes; sensitivities were raised around the 'commercialisation of malnutrition' aspects. If the standards for manufacture change as a result of the listing, consequences such as increased difficulty and cost of production could potentially create a barrier to access

rather than the intended removal of a barrier. Neither the report nor the submission document adequately addresses this issue.

Why the advocacy initiative is restricted to RUTF and does not include F75 and F100 as well? What are the potential knock-on effects for similar formulations such as Ready to Use Supplementary Foods (RUSF), other Lipid Nutrient Supplements (LNS) products, and formula milk powders?

One contributor queried whether there is sufficient evidence of the sustained success of RUTF-administration when it comes to re-introduce family foods

Whether the "essential medicines" list is the right place or should it rather be on the "essential supplies" list. A previous investigation in Ethiopia found that if the product is considered a medicine, it must be produced under pharmaceutical conditions. This would considerably increase the price of any locally produced product. It would also have to be approved for usage by the relevant country authority; a process which can take several years. There is no analysis in the submission regarding the potential cost increases and pipeline issues that may result from being listed as a medicine.

Concerns regarding the technical information contained in the submission, such as the

"strength" and "therapeutic dose regimen and length of treatment" sections. Protocols are not consistent in application of these aspects and some recent studies have achieved good results with varying doses of RUTF during treatment.

ACF responded that global action could influence countries to integrate the product into national EMLs, ultimately leading to increased prioritisation of SAM treatment with RUTF, increased budget allocation and improved inclusion within the health system and supply chain. These are critical factors to increase the availability and access to SAM treatment. The document submitted does not necessitate restricting the 'dosage' to that recommended in the submission and the composition as listed in the application is not binding. The submission proposes to add RUTF to the list as a 'miscellaneous item', not as a medicine.

While all contributors agree that this is an important debate, the final post called for an enhanced process of engagement on this proposal that enables the considered opinion of a wider group of stakeholders to be heard at the most senior levels. As the outcome is intended to have a global effect, it is important to understand the implications fully, across different countries, and for the conclusions to be supported by more than one organisation.

Recommendations for multi-sector nutrition planning: cross-context lessons from Nepal and Uganda

By Amanda Pomeroy-Stevens, Heather Viland and Sascha Lamstein



Amanda Pomeroy-Stevens is a Research and Evaluation Advisor on the USAID SPRING Project (JSI). While with SPRING she was principal investigator of the

Pathways to Better Nutrition studies and has led work on nutrition financing and nutrition-related, non-communicable disease prevention.



Heather Viland is a project coordinator for the SPRING project at JSI. Prior to joining SPRING she worked as an educator internationally and in Washington, DC.



Dr Sascha Lamstein leads SPRING's work on promoting systems thinking and strengthening for nutrition. Dr Lamstein has over 20 years' experience in health and nutrition projects.

This article summarises work completed by the USAID SPRING Project Pathways to Better Nutrition Research Teams in Uganda and Nepal (Amanda Pomeroy-Stevens, Nancy Adero, Alexis D'Agostino, Hannah Foehringer Merchant, Abel Muzoora, Daniel Lukwago, Diana Tibesigwa, Herbert Mona, Edgar Agaba, Lidan Du, Ezekiel Mupere, Madhukar B Shrestha, Monica Biradavolu, Kusum Hachhethu, Robin Houston, Indu Sharma, Jolene Wun and Manisha Shrestha).

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Location: *Nepal and Uganda*

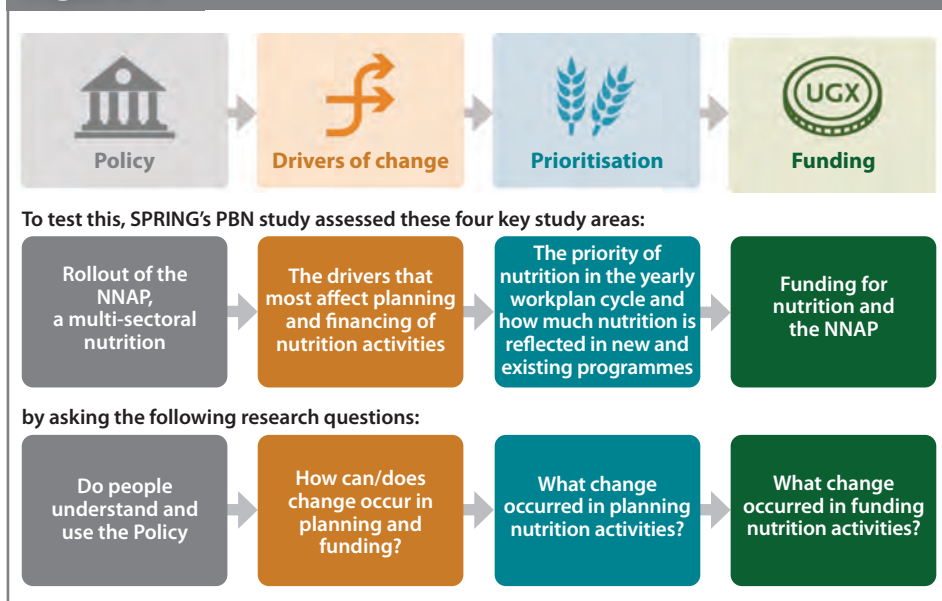
What we know: A multi-sector approach to addressing undernutrition is increasingly reflected in national multi-sector nutrition action plans (NNAPs).

What this article adds: SPRING Pathways to Better Nutrition (PBN) case studies documented successes and challenges in implementing NNAPs in Nepal and Uganda at national and sub-national level. A longitudinal, mixed-methods approach was applied across multiple levels of governance, gathering qualitative and budgetary data over two years. Common drivers of change across both countries included strong multi-sector coordination of nutrition activities that involved national nutrition secretariats and strong advocacy partnerships and communication. Barriers to change included vertical coordination, poor coordination with academia and business, high staff turnover and constrained staff availability. Integrating NNAPs into existing local and national policy and work planning structures, budgeting processes and monitoring and evaluation (M&E) systems remains a key challenge. Linked to NNAPs, increased prioritisation of nutrition across sectors and increased funding allocation for nutrition was observed; however, nutrition spend did not necessarily increase. Lack of clear accounting mechanisms for nutrition-related allocations and spending limited analysis. Cross-country recommendations include: setting long-term goals for scale-up; all partners, including donors and UN agencies aligning with NNAPs; consideration of formal funding mechanisms for nutrition; and embedding nutrition into national strategies, financial reporting systems and M&E mechanisms.

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Figure 1 Study areas and research questions



nancial reporting systems and M&E mechanisms.

Methods

Nepal and Uganda were selected to represent countries with similar nutrition goals but different contexts. They were also chosen because they have been successful, relative to other countries, in reducing undernutrition, developing NNAPs and achieving World Health Organization (WHO) nutrition governance targets (WHO 2014). Two to three districts were selected in a similar fashion in each country. In Nepal, one village development committee (VDC) per district was also selected. The district and VDC selection were not meant to be representative; rather they are examples of districts and VDCs that have already begun the NNAP rollout process and are actively addressing malnutrition.

To answer the research questions (Figure 1), a longitudinal, mixed-methods approach was applied across multiple levels of governance (see Figure 2). Methods are fully described elsewhere (Pomeroy-Stevens, Shrestha et al, 2016; Pomeroy-Stevens, Adero et al, 2016); in brief, SPRING collected both qualitative and budgetary data. Qualitative data were collected primarily through repeated, in-depth, key informant interviews (KIIs), review of minutes from meetings related to the NNAP and weekly analysis of content from major national newspaper outlets. A broad selection of stakeholders was selected for regular interviews, representing the government, donors, UN groups, the private sector, academia, and civil society.

Publicly available budget data were analysed and validated annually. SPRING’s approach to nutrition budget analysis (which included analysis

of both the allocated budget and the actual expenditures), which was developed for these studies, has now been documented in a user’s guide and tool, available on the SPRING website (www.spring-nutrition.org/publications/series/users-guide-nutrition-budget-analysis-tool).

Findings

While many useful context-specific insights came out of both country studies, some lessons appeared to span both countries.

Drivers of change in nutrition policy and programming

SPRING identified a number of factors that facilitated or hindered the influence of the NNAPs. We call these “drivers of change.” Although there were differences between the two countries, some drivers appeared to be universal across both contexts (Figure 3). In this figure, the drivers of change that cut across both countries are shown in green; those in orange were found only in one country.

Common drivers of change across countries

Multi-sector coordination of nutrition activities:

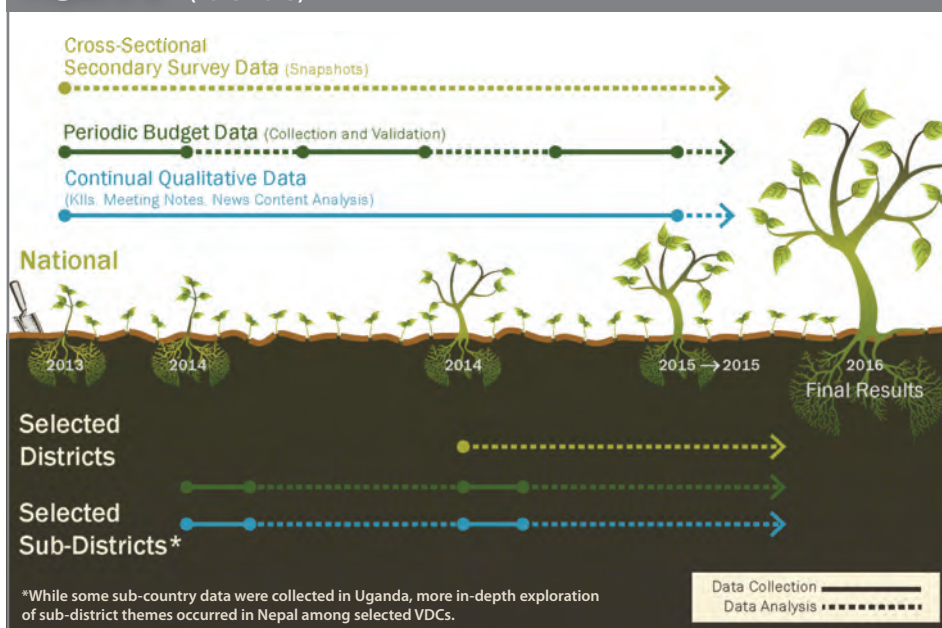
Coordination of nutrition planning, funding and implementation across sectors, stakeholders and government levels was identified by nearly all stakeholders as critical for scaling up nutrition programming. Changes in decision-makers’ behaviours and perceptions, as a result of improved coordination, can make a large difference when it comes to what is prioritised and funded.

Across both countries, stakeholders reported that multi-sector coordination at national level improved during the study period; many attributed this improvement to the NNAP structures. Moreover, there has been greater acceptance of the nutrition secretariats (the NPC in Nepal and the OPM in Uganda) as coordinating bodies. It was also noted that, over the course of the study, working groups or technical committees became more active, with regular coordination meetings and greater participation of different sectors during meetings.

Stakeholders also reported improvement in inter-sector coordination; increased understanding of multi-sector approaches to nutrition and the importance of such an approach to combatting malnutrition; increased understanding of the purpose and content of their NNAP; and increased understanding of each sector’s roles and responsibilities in supporting the NNAP.

Some constraints were also noted in coordination across both countries. Vertical coordination (coordination between national, district and community levels) was identified as a key barrier to implementation of nutrition activities. In both Nepal and Uganda, structures had been established for coordination at the district level and below, but many stakeholders felt that these structures remained isolated from the national level, due to a breakdown in feedback loops, inadequate time given for lower-level work planning and lack of budget flexibility at the local level.

Figure 2 SPRING’s mixed methods approach in Nepal (2014-2016) and Uganda (2013-2015)



*While some sub-country data were collected in Uganda, more in-depth exploration of sub-district themes occurred in Nepal among selected VDCs.

Figure 3 Common drivers of change for nutrition in Nepal and Uganda

Coordination with the private sector and academia was also a struggle. While we did see an increase in private sector organisations' interest in nutrition and the NNAPs in both countries, this had not yet translated into increased engagement. Key informants from private sector organisations in Nepal felt they needed a nutrition focal person dedicated to coordinating private sector actions and meeting with private sector representatives. Key informants from academia were frustrated with the stalled progress and concerned with the lack of engagement of academia. During the study period, the academic and private sector coordination working groups either did not exist, or their creation had stalled and no meetings were convened.

Human resources: An important driver of change in how nutrition is prioritised and funded is the level of human resources that are committed and made available for nutrition. Human resources include all people engaged in nutrition, including clinical and community providers, policy makers, programme managers and support staff at every level in every stakeholder group.

High staff turnover was one of the biggest human-resource constraints in both countries, across all levels, stakeholder groups and sectors. This was also true of the NNAP focal positions, with just under half of these positions turning over in both countries and an additional position in Uganda and two positions in Nepal going vacant during the period of the study. This affected institutional memory and commitment to nutrition and contributed to delays in spending funds earmarked for nutrition.

Staff availability was another universal human-resources issue. This particularly affected government staff and provider and policy-making positions in hard-to-reach areas. This shortage of staff meant that often one person had to hold several positions, leading to burnout and reducing staff interaction on key NNAP committee meetings.

Advocacy for nutrition: Advocacy for nutrition is a critical driver in convincing governments and development partners to prioritise and al-

locate funds for nutrition. Advocacy was an area in both countries where we saw regular multi-sector activities and regular partnerships between the government, funders (donors and UN groups) and CSOs. Both countries saw major advocacy milestones during the study period, including the launch of advocacy and communication working groups and strategies, and successful lobbying for new nutrition activities. Beyond that, the successes and formation of efforts varied quite a bit.

Another universal aspect was the desire and need for advocacy to happen at many levels, from grassroots to the highest echelon. In both countries there was persistent concern about how to fully engage parliamentarians and other high-level champions in the nutrition effort.

Sustainable structures: To maintain momentum for nutrition or accelerate progress, structures and processes for planning, funding, implementing and monitoring nutrition activities must be in place. Stakeholders have an important role in ensuring that nutrition is embedded in existing local and national policy and work-planning

structures, budgeting processes and monitoring and evaluation (M&E) systems in order to ensure sustained commitment to nutrition.

We heard a lot about the importance of building nutrition into existing systems in both countries, especially financing and M&E structures (planning structures were also discussed but often in more indirect terms). Both countries were considering options for creating more permanent financing mechanisms (including tracking codes, budget lines and pooled funds), but only Nepal had instituted a budget line designated for nutrition by the end of the study.

Building nutrition indicators into M&E strategies and structures seemed a particularly difficult issue in both countries. Despite what appeared to be significant effort and discussion both before and during the study period, the NNAP M&E frameworks in both countries had still not become operationalised as of 2016. Some of the difficulties that crossed over in both contexts included sensitivity on who has to report M&E data to whom across sectors and stakeholder groups and how to develop or strengthen reporting up from the districts and below.

Successes in understanding and increased priority of nutrition across sectors

Understanding is pivotal to creating high-level coordination and implementation at scale. We found that, over the course of the study, understanding and use of the NNAP by all nutrition stakeholders increased. This included not just understanding the purpose and content of the NNAPs, but also understanding each stakeholder group's roles and responsibilities for supporting the policy. We also found that NNAPs expanded or increased knowledge of nutrition as a multi-sector issue, addressed by nutrition-specific and nutrition-sensitive actions, at least down to district level. This appeared to be facilitated in both countries by local and regional trainings coordinated by nutrition secretariats.

SPRING, Nepal, 2016



Speakers in the case study dissemination event in Nepal, 2016

Regarding the extent to which nutrition was seen as a priority, it appeared that one of the main mechanisms to indicate this (and translate it into action) was to name nutrition as a priority in sector or organisational strategy documents.

In Nepal, three of six sectors had nutrition as a named priority by the end of the study and the education sector had elevated it to core theme (which doesn't designate funding but increased the visibility of nutrition within the ministry). These changes came about after months of internal discussions, advocacy for nutrition and changes to internal organisational structures (including creation or promotion of nutrition units and creation of nutrition staff positions).

In Uganda, there was increased activity to move toward including nutrition as a named priority in strategy documents by three ministries (Ministry of Agriculture, Animal Industry and Fisheries (MAAIF); Health (MoH); and Trade, Industry and Cooperatives (MTIC)), although this had not resulted in formal inclusion as of 2015.

Few major changes were noted in the way nutrition was included in strategy documents for donors and UN groups, but this is in part due to the five-year life of many UN policies and strategies. Ministries often noted the NNAP's influence on their sector strategy, whereas donors and UN groups were more likely to cite the global nutrition agenda for any changes to their strategy documents.

Challenges in tracking and spending nutrition funding

SPRING posited that increased prioritisation of nutrition should, in theory, increase allocations and spending on nutrition activities. In general across both countries, we did see that where there were clear increases in priority (through inclusion of nutrition in strategy documents and advocacy and approval for new nutrition activities), increased funding was also allocated for nutrition.

This was particularly true for Nepal, where increased planning and priority for nutrition resulted in steady increases in nutrition-related allocations of about 17 per cent per year, with a quarter of this funding dedicated to new NNAP-related activities.

In Uganda, where nutrition is not identified as a named priority in sector plans, no new activities were planned, resulting in no new nutrition-related funding over time. Nutrition-specific allocations made up between 11 and 32 per cent of these totals, depending on the country and whether allocations were run within the government budget or not. In both countries, even when allocations increased within a sector or organisation, it did not always result in more available funding, because actual spending on nutrition did not always increase. However, measurement of this gap was complicated due to missing expenditure data.

Across both countries, there was a lack of clear accounting mechanisms for nutrition-related allocations and spending, especially for funding from external development partners (EDPs) that is managed outside the official government budget. Tracking this "off-budget" funding is a challenge faced by many countries, not just Nepal and Uganda (D'Agostino et al, 2016). Both Nepal and Uganda launched Aid Management Portals during the course of this study to help deal with this limitation and Nepal updated its development cooperation policy to try to ensure better reporting. Within government, a few ministries have created nutrition and/or food security units, divisions or departments, which help to clarify where to find nutrition-related funds.

SPRING was able to analyse on-budget spending data and we compared these findings to qualitative data on stakeholder's perceptions of why allocations were not fully spent. While some context-specific factors came into play, the two primary reasons given in both countries for money not being fully spent were delayed release of funds to projects (due to delays in

ministries authorising the budget releases) and procurement delays at the local level (due to the lengthy bidding and proposal process required for any activity involving purchase of capital investments or commodities). These factors led to delays of multiple months in both countries, effectively reducing the length of the financial year and the time to spend allocations.

Cross-context recommendations

Country-specific recommendations can be found elsewhere (Pomeroy-Stevens, Shrestha et al, 2016; Pomeroy-Stevens, Adero et al, 2016). Here, we have compiled recommendations that applied across both study contexts. While this does not mean they are applicable to every country with an NNAP in place, the recommendations may provide useful insights to countries at similar stages of the policy-making process.

Take a long view of scale-up. Nepal has a long history of incorporating nutrition into its plans, so it may be easier for countries with an existing nutrition focus to develop a plan and incorporate spending. The UNAP in Uganda, on the other hand, is the first truly multi-sector NNAP; therefore more time may be needed to achieve the goal of reducing undernutrition. Several stakeholders mentioned how important it is to sustain commitment to scaling up nutrition and noted that it may take until the end of the second or even the third iteration of UNAP before large-scale changes in undernutrition status are evident (Pomeroy-Stevens et al, 2014). These observations suggest that nationwide scale-up of nutrition programmes will take longer than the full tenure of the next five-year nutrition plan. Governments implementing similar NNAP should set longer-term goals and targets (e.g. over 15 to 20 years) for how and when to scale up nutrition programmes fully.

Reach the lowest level. Local-level policy and decision makers are key assets to help increase understanding and the importance of nutrition across multiple sectors, especially in urban development and education. Their increased awareness will help generate demand for nutrition in the local planning process. Both Nepal and Uganda faced obstacles to achieving improved understanding and prioritisation of the NNAP at the lowest level (i.e. the sub-district and community level) due to staff availability, lack of NNAP operational guidelines and lack of NNAP M&E guidance for nutrition (Adero et al, 2016; Biradavolu et al, 2016). Other countries need to plan how to reach this level as they design their NNAP and NNAP operational guidelines.

Build sustainable structures. While both Nepal and Uganda have embedded NNAP coordinating bodies within the government, much of the planning, financing and monitoring of NNAP activities is done ad hoc on a year-to-year basis and often outside government structures like sector planning documents, the budget and information systems. Although it is sometimes easier and quicker to build systems for planning, financing and monitoring NNAPs outside these



Participants in the case study dissemination event in Nepal, 2016

existing structures, it is vital to build long-term, systemic commitment for nutrition within them. Consider how to embed nutrition into planning strategy documents, financial reporting systems and M&E mechanisms.

Address constraints on human resources for nutrition. Insufficient human resource is not unique to nutrition; many major international initiatives are dedicated to finding solutions for this issue. What is unique to nutrition is a lack of dedicated training pipelines, professional support services and standardisation of core curriculum. Government funding will be necessary to address some of these issues, but EDP support is also needed. Innovative solutions are needed to prevent staff who are already in nutrition positions from leaving. This could be done through incentive programmes, procedures for hand-off of existing positions and targeted training to ensure staff feel prepared to do their job. Any increase in dedicated nutrition funding could also provide a more consistent resource envelope for nutrition-related positions in both government and non-government organisations.

Launch monitoring and evaluation frameworks. In both countries, M&E frameworks were not launched until the end of the plan. The complexity of these frameworks will encourage lengthy deliberation, but countries who want to learn from the experience of Nepal and Uganda may want to launch a draft M&E framework earlier, even in the first year of the NNAP, and then allow for iterative editing to make sure that at least those indicators most crucial to decision-making and evaluation are being collected from the start of the NNAP. The ability to show what has been accomplished by the NNAP (either through simple counts of those served or more long-term nutrition outcomes) is one of the most important ways to keep stakeholders motivated.

Align with NNAP. All partners working in nutrition should align planned activities with the NNAPs. Evidence indicated that while EDPs in Nepal and Uganda (particularly donors and UN groups) gave substantial support to nutrition activities, they seemed primarily to follow their own global agenda for nutrition. EDPs working in other countries with NNAPs should increase their efforts to align and support those plans.

Embed nutrition in sector and organisational plans. One way to help partners remember to incorporate the prioritisation of the NNAP is to use it as a guiding document to reframe sector and organisational plans to get everyone on the same page. In addition, the more policies and plans that list nutrition as a priority, the more likely that greater funding for new activities will be allotted. Commitment to nutrition can be accelerated and sustained if it is included as a top priority in each sector's investment and development plans and within each district's development plans. The specifics of this recommendation may need to be adjusted to each country's planning structures and documents, but the essence remains that nutrition needs to be embedded in each sector.

Use budgets as planning tools. We found that some ministries and CSOs were not using budgets as an integral part of their nutrition-activity planning process. Increasing the usage and budget literacy of nutrition technical people would increase demand for accurate and timely spending data.

Invest in key drivers of change. When governments put money towards something, it attracts other sources of funding because it demonstrates a government's commitment to that idea. Countries looking to operationalise their NNAPs should explore how to seed-fund key drivers of change. This could be done by providing funds

or other non-monetary commitments to establish and maintain coordination mechanisms, human resources and advocacy activities, and embed nutrition into existing structures.

Consider formal funding mechanisms for nutrition. While it is not necessary for governments to establish formal funding mechanisms like a budget line or a tracking code for nutrition, it is important for countries with NNAPs to explicitly state how the NNAP will be financed and how to monitor allocations and spending throughout the policy cycle. Some form of routine nutrition budget tracking must be put into place to increase transparency and accountability for nutrition spending. Peru and Guatemala are good examples of routine nutrition-budget tracking within government reporting systems (Victoria et al, 2016).

Conclusions

Even the most comprehensive multi-sector NNAP must influence key drivers of change before it can create improvements in prioritising and funding nutrition activities. The findings from the PBN studies indicate that the governments of Nepal and Uganda and their partners have made positive progress toward multi-sector coordination of nutrition work and that NNAPs have been influential in fostering such coordination, as well as other country-specific changes in advocacy and sustainable structures for nutrition. In the case of Nepal, this led to new nutrition activities and greater nutrition-related funding. While these studies only covered two country contexts, we believe that some useful lessons can be learned from their experiences and recommendations provided from the PBN case studies can help in many other countries that are planning and implementing multi-sectorily.

For more information, contact: Amanda Pomeroy-Stevens, email: heather_viland@jsi.com

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Samaritan's Purse, South Sudan, 2016

Woman in Unity State demonstrating ingredients for a diversified meal

Using care groups in emergencies in South Sudan

By Peter Ndungu and Julie Tanaka



Peter Ndungu is a Nutrition Programme Manager with Samaritan's Purse South Sudan. He manages the Blanket and Targeted Supplementary Feeding

Programmes and the Care Groups IYCF project. He previously worked with MSF in nutrition programmes in South Sudan and Nigeria. Peter is a trained clinician and is currently completing his Masters in Public Health.



Julie Tanaka is the Senior International Nutrition Advisor for Samaritan's Purse. She helps field offices around the world with programme design, proposal review,

implementation, nutrition surveys, trainings, monitoring and evaluation, and emergency relief.

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Location: South Sudan

What we know: The Care Groups Model is a common approach to achieve social and behaviour change.

What this article adds: A Care Groups project targeting infant and young child feeding (IYCF) behaviour change was initiated by Samaritan's Purse in South Sudan in 2015. Escalation in violence soon afterwards led to adaptation of the care groups model to the emergency context (characterised by a transient population and short-term funding). The core delivery structure of Programme Coordinator, Supervisor, Promoters, Lead Mothers and Neighbourhood Women was retained. The main adaptation was to have open groups, allowing mothers to join and leave groups at will, enabling continued access for those displaced. Project staff identified beneficiaries at household level (looking for saturation registration of target group). Informal communication networks facilitated easy flexibility and adaptation. Smaller groups worked best. An endline Knowledge, Attitudes and Practice (KAP) survey found improvements in IYCF practices; endline SMART found a deterioration in nutritional status of children, indicative of prevalent food insecurity.

Background

On December 15, 2013, violence erupted in Juba, South Sudan, following fighting between government and opposition forces. The violence rapidly spread to other parts of the country, causing displacement of an estimated 1.5 million people. Ongoing military campaigns have been concentrated in three key strongholds across the county: Jonglei, Upper Nile and Unity State. Samaritan's Purse (SP) is currently working in various counties within Unity State and Upper Nile State, serving at-risk populations with WASH (water, sanitation and hygiene), food security, livelihoods and nutrition interventions. The nutrition interventions include a stabilisation centre (SC), outpatient therapeutic programmes (OTP), targeted and blanket supplementary feeding programmes, general food distributions, mother-to-mother support groups and care groups.

The county in Unity State where Samaritan's Purse implemented a Care Groups project is one of the most affected counties in the ongoing South Sudan conflict. Fighting has continued to have devastating effects on the population, leading to loss of life, destruction of property and infrastructure, and massive population movement. Most of the men are engaged in military activities, with women acting as head of the household. This has increased women's workload and caloric expenditure, which in turn has increased their risk of malnutrition. Moreover, now that women are carrying out many roles, the amount of time they are able to spend feeding and caring for their children has decreased, which increases children's risk of malnutrition. Agriculture is the county's primary economic activity. The people are nomadic agro-pastoralists who engage in both agriculture and the rearing of livestock, especially cattle. Fishing is also a

major part of people's livelihoods. The population is very transient. The men often move around to look for pastures for their livestock and for military activities. The women frequently move location to look for food or to access healthcare.

Project context

An Initial Rapid Needs Assessment (IRNA), conducted by Samaritan's Purse in March 2014, indicated that many of the internally displaced believed that because mothers did not have enough food, they could not produce enough breastmilk. This led to children as young as four months old being given undiluted animal milk to supplement breastmilk. Because of the lack of staple foods, mothers were unable to introduce adequate complementary feeding. Consequently, some children over six months old were relying solely on breastmilk for nutrition. Children aged 6-23 months were not meeting minimum dietary diversity requirements or minimum meal frequency requirements. This information, combined with the lack of previous infant and young child feeding (IYCF) interventions, indicated the need to promote IYCF practices in the target county.

On December 15, 2015, Samaritan's Purse started a Care Groups project in five payams¹ in Unity State. A few months before implementation began, fighting in the county escalated because control of the town switched from opposition to government forces. The county was greatly affected by the conflict because of the ethnic profile and militarisation of residents. After many were killed, people from the area fled into the swamps. Some lived there for weeks, others for months, drinking dirty water and eating wild foods

¹ The second-lowest administrative division, below counties, in South Sudan, with a minimum population of 25,000.

such as lily pods. Samaritan's Purse decided to proceed with the planned Care Groups project, even though the situation had changed from a protracted emergency to a more acute emergency context.

Care Groups approach

The Care Groups project proposed to reduce nutrition-related morbidity and mortality through the promotion of IYCF practices and behaviour-change services to women of reproductive age (WRA) aged between 15 and 49 years. Optimal IYCF practices were encouraged and women were empowered to overcome key barriers by developing creative solutions in the circumstances. Mother-in-laws and grandmothers, who play an influential role in child-rearing, were incorporated into the project during home visits.

The Care Groups Model was selected to deliver the proposed IYCF activities, given the evidence base behind using Care Groups for social and behaviour change. Many tools and resources compiled by practitioners of the model, and its capability to reach 100% of target beneficiaries, have made it one of the best-practice methodologies in promoting social and behaviour change for health and nutrition projects. Given the escalation in conflict with a now more transient population, and since only one-year funding was available (U.S. Office of Foreign Disaster Assistance (OFDA)), the Care Groups Model was adapted to fit the acute emergency context more practically.

A Knowledge, Attitudes and Practice (KAP) survey was conducted at the outset to provide a baseline of IYCF practices and was used to inform the development and focus of the training manual. A two-stage cluster sampling methodology was used for a total sample size of 1,132 caregivers of

children aged 0-23 months. In the first stage, clusters were selected using probability proportional to size (PPS). The Expanded Programme on Immunisation (EPI) method was used in the second stage for household selection. Results of the KAP survey revealed that 19% of children sampled met minimum dietary diversity requirements, 28% met minimum meal frequency standards, and only 26% had a minimum acceptable diet. Of the infants included in the survey, 35% were found to be exclusively breastfed, with a majority receiving breastmilk along with other liquids, including water and yogurt. Focus group discussions revealed local myths about babies needing oil and water for digestion before six months of age, gaps in knowledge around a woman's breastmilk supply, cultural beliefs around what constituted proper 'children's food', and issues with women's time and workload that made breastfeeding and responsive feeding difficult.

A SMART survey was also conducted to supplement the KAP baseline survey. A sample size of 430 was used for children aged 6-59 months. The global acute malnutrition (GAM) prevalence was 16.1% [(12.1- 21.0, 95% C.I.)] and the severe acute malnutrition (SAM) prevalence was 2.4% [1.3-4.5, 95% C.I.]. The fact that the GAM prevalence was above the WHO emergency threshold highlighted the acute needs in the area. Stunting prevalence was 13% [9.3-17.4, 95% C.I.] The survey findings indicated poor health-seeking behaviours by the caregivers, with only 39.3% seeking assistance. This is likely due, in part, to the fact that only one primary healthcare unit was in operation in the county and healthcare access was particularly difficult for more remote villages. The Crude Mortality Rate (CMR) was 2.78 deaths per 10,000 per day [2.22-3.47, 95% C.I.], while the U5 Mortality

Rate (U5MR) was 0.71 deaths per 10,000 per day [0.27-1.85 95% C.I.]. The CMR mortality rate was above the WHO emergency threshold.

Care Group structure

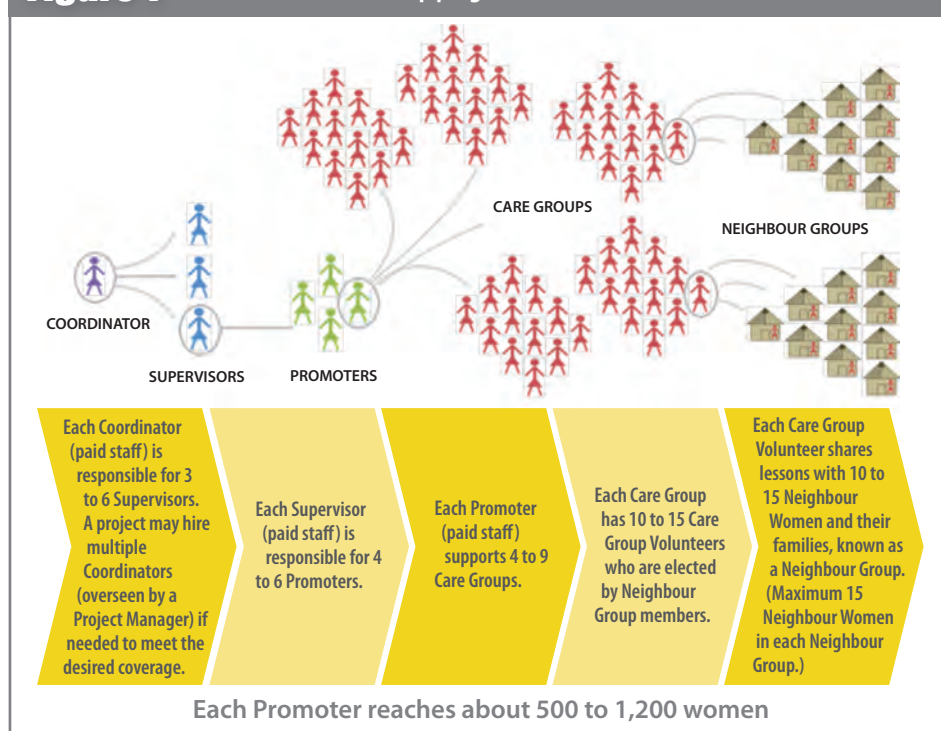
In the Care Group model, paid staff (Promoters), are trained by the Programme Supervisors and the Programme Coordinator (see Figure 1). The Promoters would, in turn, train Leader Mothers (LMs), who are formed into Care Groups. These LMs then train Neighbour Women (NW), either in Neighbourhood Groups or in one-on-one, bi-weekly sessions, with messages they are taught by the Promoters. This cascade model relies on the strength of LM volunteerism and usually achieves greater coverage of the target population and greater behaviour-change results than traditional mothers' club methods. Because of its intense monitoring and evaluation, preparation work and comprehensive coverage, this approach is not usually employed in an emergency context.

In this Samaritan's Purse Care Groups project, the paid Promoters were trained on the Care Group model protocols, IYCF behaviour change and participatory training methods. The six IYCF topics that were covered were: timely initiation of breastfeeding (colostrum feeding); exclusive breastfeeding for the first six months; complementary feeding after six months with soft foods and gradual increasing of amounts and density with age; continued breastfeeding up to two years; adequate feeding with breastfeeding/meal frequency three to four times a day; and balanced diet for children (healthy diet, fewer infections).

Due to the 12-month project implementation timeline, the programme found that the most expedient way to carry out the Care Groups census, used to identify beneficiaries and place them in groups, was to conduct house-to-house visits. A 'Household Level Selection' approach was used in which Promoters entered villages to systematically count 11 adjoining households (HHs). Women of reproductive age identified in each of the 11 adjoining HHs were registered for participation in the Care Groups project. Promoters covered every geographical area in the villages to ensure that all the women in the target group were accounted for. Among these HHs, the women would gather among themselves to appoint their own LM. They typically selected women who had confidence, commanded respect and trust, and were good public speakers. A total of 320 LMs were selected to form 32 Care Groups. Each Promoter was allocated eight CGs (80 LMs), in the payams they resided in. This ensured that Promoters did not walk for long distances to train, monitor and offer supportive supervision to the LMs. Each LM would reach her 10 NW through Neighbourhood Group meetings.

In traditional Care Groups projects, Neighbourhood Groups usually have a set number of

Figure 1 Structure of a Care Group programme²



² The Technical and Operational Performance Support Program (TOPS) 2016. *Care Groups: A Reference Guide for Practitioners*. Washington, DC: The Technical and Operational Performance Support Program.

Figure 2 Improvement in key WHO IYCF indicators

Indicator	Baseline	Endline
Timely Initiation of Breastfeeding	75%	85%
EBF (Exclusive breastfeeding for the first six months)	35%	74%
MDD (Minimum dietary diversity)	19%	59%
MMF (Minimum meal frequency)	28%	58%
MAD (Minimum acceptable diet)	26%	33%

women who do not change. For this emergency context, these groups were left open to accommodate women who moved; this was the most significant adaptation made to the Care Groups model for the emergency context. Throughout the one-year project period, the women remained transient, due to the slow trickle of displaced returnees and subsequent flooding in the area (requiring Promoters to use canoes to reach LMs). This meant that some LMs and NW were displaced from their original groups. To ensure that the women continued to receive behaviour-change messages, the LMs would trace the movement of the displaced women and connect them to Neighbourhood Groups in the locality where they moved, with assistance from the Promoters.

In addition to learning helpful health and nutrition information, displaced women were able to find a support structure in their Neighbourhood Groups that helped them in their transition. Displaced LMs were allocated NW for new groups if existing groups reached capacity. The tracing of population movement relied heavily on informal information channels, with Promoters and LMs sharing information via telephone and the grapevine of women who left and new women who arrived. These informal conversations allowed everyone to triangulate information and ensure everyone was accounted for.

Results

Even though the IYCF project in Unity State was only one year as opposed to the typical three-to-five year lifespan of a Care Groups project, it achieved significant results. The endline KAP survey was conducted with a sample size of 470 children aged 0-23 months using a two-stage cluster sampling methodology. The first stage used PPS to randomly select the clusters; the second stage used simple random sampling to select households. The results showed the improvement of key WHO IYCF indicators (figure 2).

The endline SMART survey sampled 432 children aged 6-59 months and found a GAM prevalence of 19.6% [16.1-23.6, 95% C.I.]; a SAM prevalence of 3.6% [2.4-5.5, 95% C.I.]; and a stunting prevalence of 13.6% [10.7-17.2, 95% C.I.], indicating a deterioration and highlighting the need for greater coverage of acute malnutrition treatment services. Although the security situation stabilised during the year, a disrupted planting season and problems with flooding continued to plague the county, perpetuating a tenuous food security situation. It

is likely that IYCF improvements are attributable to the Care Groups intervention and not due to a significantly improved external environment or other interventions that were started in the previous year.

In total, the Care Groups component within this larger, multi-sector project had a budget of US \$345,402. The project:

- Trained 320 LMs on six IYCF topics, which they passed on to 320 neighbourhood groups, reaching 3,832 NW.
- Conducted two cooking demonstrations for 320 LMs; topics covered included hygienic handling, preparation and benefits of foods for nutrition.
- To ensure correct messages were passed on to the beneficiaries, IYCF promoters carried out 400 supervisory contacts with LMs during the trainings conducted in the community.

Lessons learned

In an emergency context, the census must be conducted in the most expedient way possible, given the limitations on time and length of funding. Using 'Household Level Selection' of beneficiaries allowed project staff to identify beneficiaries and place them in groups, and still allowed for 100% coverage of the target group and a group-nominated LM. This method worked well with transient populations in an emergency context, when it was not possible to get accurate

and up-to-date lists of beneficiaries from community leaders.

Because of the saturation approach of the Care Groups model, all the women in the target age range (15 to 49 years of age) or target status (e.g. pregnant women) within a geographical area are registered to participate in the project. This methodology works well in areas where there may be tension among different socioeconomic, ethnic or livelihood groups, since it prevents workers from subjectively excluding some of the more vulnerable women from the project.

Allowing for shifting Neighbourhood Group membership enabled the project to adapt to population movement caused by insecurity and flooding. Frequent meetings and communication between project staff and beneficiaries allowed for the informal communication networks that facilitated easy flexibility and adaptation of the Care Groups when the displacement occurred and there was an influx of IDPs. This is why it was easy to connect NW to new groups.

In transient communities and those with frequent conflict, it is good to assign fewer women of whom the LMs are in charge. Neighbourhood Groups typically have between 10-15 NW, but it is best to limit the numbers of NW to around 10. This will allow the groups to accommodate more people if there is displacement, especially if there are expected seasonal displacements that happen on an annual basis. To prevent disruptions in the group leadership structure, LMs who relocate should appoint a replacement LM to lead the Neighbourhood Group.

For more information, contact: Julie Tanaka, jtanaka@samaritan.org

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Woman in Unity State cooking her meal

A child enrolled in an outpatient therapeutic programme



Save the Children, Ethiopia, 2016

Assessing the differences in the scale of nutrition response efforts to El Niño in Ethiopia

By Getinet Babu, Alexandra Rutishauser-Perera and Claudine Prudhon



Getinet Babu is a humanitarian nutritionist with over 12 years' extensive international and

national experience in the sector and is currently a nutrition advisor in the Humanitarian Surge Team with Save the Children UK.



Alexandra Rutishauser-Perera, has 11 years of experience in both humanitarian and development

contexts and is currently the global humanitarian nutrition advisor with Save the Children UK.



Claudine Prudhon PhD is a researcher in humanitarian infant and young child feeding in emergencies with

Save the Children UK.

Location: *Ethiopia*

What we know: Ethiopia suffered the worst droughts in decades in 2011 and in 2016, requiring nutrition emergency response.

What this article adds: Save the Children has compared the 2011 and 2016 nutrition responses. The severity of the drought was greater in 2016. The Government of Ethiopia led the humanitarian effort, supported by partners including UNICEF, WFP, OCHA, NGOs and donors. There was a significant improvement in the 2016 response compared to 2011 in terms of government leadership, programme coverage and quality of intervention. Humanitarian nutrition partners' commitment to the country humanitarian coordination mechanism was strong. There was greater nutrition staff capacity in-country, a reflection of capacity-building since 2011. As a result, more children were screened in 2016 (13 million) compared to 2011 (3.3 million) and the nutrition response reinforced existing community systems, rather than taking the form of direct implementation. Persisting challenges include capacity limitations at multiple levels, reporting and referral pathways between sectors, and the need for a more comprehensive nutrition response.

Context

In Ethiopia 80% of the population relies on rain-fed agriculture or pastoralism. In 2015-16, the country experienced one of the worst droughts in decades, driven by El Niño; eastern areas were particularly affected (see Figure 1). The most recent previous drought was in 2011, when two consecutive seasonal rains failed, impacting the southern, eastern and north-eastern parts of the country (Somali, Afar, East and Southern Tigray, Southern Oromia and SNNPR) (see Figure 2). This article compares and contrasts the nutrition response to the droughts.

Projected needs

In the 2015-16 response, estimates of those in need of urgent food assistance rose from 2.9 million

in January 2015 to 9.7 million (10% of the total population) in August 2016¹. An additional eight million people were benefitting from the Productive Safety Net Programme (cash and food support). Projected acute malnutrition caseloads for under-fives and pregnant and lactating women were higher than previous years, including the 2011 drought year, and expected to rise (see Table 1).

Twenty-one biannual standard nutrition surveys (BANs) were conducted between December 2015 and January 2016 (Afar, Amhara, Tigray, SNNPR and Oromia regions). Of the four classifications

¹ Mid-year review of the 2016 Humanitarian Requirements Document.

Figure 1 Prioritisation of emergency relief beneficiaries in Ethiopia, July 2011

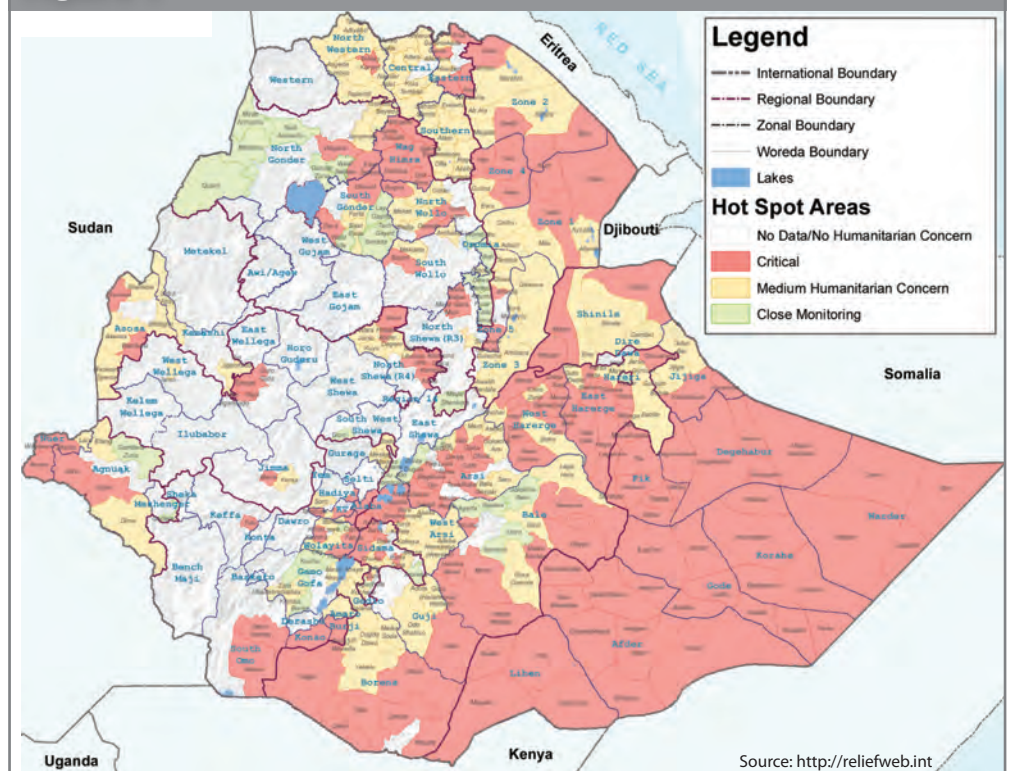
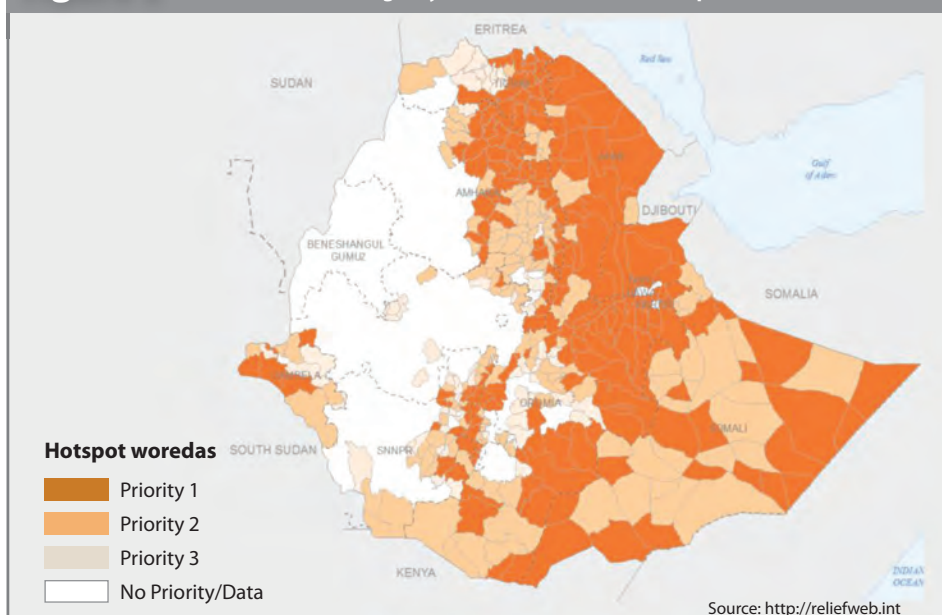


Figure 2 Prioritisation of emergency relief beneficiaries in Ethiopia, March, 2016



used to describe the nutrition situation, two out of 21 surveys were classified “critical”; four “serious”; 11 “poor”; and four “normal” or “typical” (see Table 2 for a selection of survey results). In addition, Ethiopia has an established early warning system, involving “hotspot” nutrition and food security data collection and classification systems, similar to the Integrated Food Security Phase Classification (IPC). In July 2016, a total

of 420 hotspot priority 1 to priority 3 districts were identified, compared to 347 in June 2011 (see Table 3 for 2016 breakdown).

Modalities of the 2016 response

Coordination

The Government of Ethiopia led the humanitarian response, supported by partners including

UNICEF, WFP, OCHA, NGOs and donors. The Government activated the Multi-Agency Coordination (MAC) and Incidence Command Systems (ICS) taskforce, which was expanded to include representation from humanitarian and donor partners. The MAC provides strategic guidance and coordinates response at national level. The ICS facilitates and coordinates response at regional and zonal levels. Sector efforts are coordinated by taskforces established in each line ministry. For example, water, sanitation and hygiene (WASH) assistance is coordinated by the Ministry of Water, with support from UNICEF through the WASH Emergency Task Force (ETF)/WASH Cluster. Health and nutrition assistance is coordinated by the Federal Ministry of Health (FMOH) with support from the Health and Nutrition Taskforce and ENCU.

The 2015-16 response reflected lessons learned from the 2011 response, with new or improved systems in place. Key elements of the 2015-16 response included:

Treatment of severe acute malnutrition (SAM): Community-based management of acute malnutrition (CMAM) services are delivered through the Health Extension Programme to treat severe acute malnutrition (SAM). Escalation in caseload beyond capacity of health facilities was met by scale-up of supportive interventions, involving training, quality assurance (supervision), human resource management and strong coordination with the district-level health department. (For an example of such scale-up, see field article by GOAL in this edition of Field Exchange).

Logistics support to improve access to therapeutic food, drugs and medical supplies:

Supplies of ready-to-use therapeutic food (RUTF) to cover 75% of estimated need and F-75 and F-100 therapeutic milk and medications were supplied by UNICEF and the zonal/district health offices. Nutrition partners provided logistic support and additional supplies as needed. During the first half of 2016, 194,8923 cartons of RUTF were dispatched to the regions.

Strengthening of referral systems linking services to communities: Nutrition-sector partners supported hospitals, health centres, health posts and mobile health and nutrition teams (MHNTs) and strengthened referral systems between outpatient therapeutic programmes (OTPs), stabilisation centres (SCs) and community screening points. Vitamin A supplementation (VAS) was combined with screening and referral of malnourished children. Treatment facilities expanded; as of September 2016, SAM services were available at 14,903 OTPs and 1,527 SCs, as well as 49 MHNTs nationally.

Screening: Since 2012, the FMOH has implemented Child Health Days (CHDs), a joint programme supported by UNICEF and WFP. District-level health office and health extension

Table 1 Estimated humanitarian needs in 2015/16 and 2011 drought responses

	2016 revised HRD	2011 revised HRD
People in need of food assistance	9.7 million	4.5 million
Child < 5 years and PLW in need of MAM treatment	2.36 million	708,921
Children < 5 in need of SAM treatment	420,000*	328,750
Screening for malnutrition caseload	13 million	3.35 million

HRD: Humanitarian requirements document

*2016 figures might have been more accurate if more experts had been involved in the calculation of needs.

Table 2 Selection of nutrition surveys conducted in Ethiopia in 2015/2016

Region	Zone	Woreda	Partner	Date of Survey	GAM (95%CI)	SAM (95%CI)	CMR/ 10,000 persons/day	U5MR/ 10,000 persons/day	Stage of Alert
Tigray	Central	Tanqua Abergele	Tigray DPPB	13-23 December 2015	11.0% (8.4-14.3)	0.4% (0.1-1.2)	0.14 (0.06-0.31)	0.13 (0.02-0.94)	Serious
Afar	Zone 1	Adaar	DPFSPO	18-25 Jan 2016	12.5% (10.1-15.3)	0.5% (0.1-2.0)	0.06 (0.01-0.25)	0.00 (0.00-0.00)	Serious
	Zone 5	Hadeleala	DPFSPO	27 Jan-2 Feb 2016	7.7% (5.6-10.4)	0.0% (0.0-0.0)	0.08% (0.02-0.31)	0.00 (0.00-0.00)	Poor
Amhara	N. Wello	Gubalafto	DPFSCO	14-31 December 2015	9.0% (7.2-11.2)	0.3% (0.1-1.2)	0.11 (0.05-0.25)	0.15 (0.02-0.14)	Poor
Amhara	S. Wello	Dessie Zuria	DPFSCO	21 December, 2015-2 January 2016	10.0% (7.5-13.3)	0.5% (0.1-2.0)	0.13 (0.06-0.26)	0.25 (0.03-1.82)	Serious
Oromia	Borena	Miyo	ODPPC	15-31 December 2015	6.4% (3.9-10.2)	1.4% (0.6-3.0)	0.00 (0.00-0.00)	0.00 (0.00-0.00)	Poor
Somali	Shabale	Kelafo	Somali DPPB	29 December 2015-8 January 2016	19.7% (16.5-23.4)	2.6% (1.6-4.2)	0.46 (0.22-0.83)	0.33 (0.08-1.33)	Critical

² Priority 1 is equivalent to ‘Humanitarian Emergency’; Priority 2 indicates ‘Acute Food and Livelihood Crisis’; and Priority 3 indicates ‘Moderate Food Insecure or Chronically Food Insecure’.

³ UNICEF Ethiopia emergency info graph, March 2016.

Table 3 Classification of hotspot priority districts (2015/16 and 2010/11)

Period of classification	Hotspot classification			Total district
	1	2	3	
2015/16				
	1	2	3	
Dec-15	186	155	89	430
Mar-16	128	107	98	333
Jul-11	172	138	37	347
2010/11				
Dec-10	77	123	103	303
Mar-11	128	107	98	333
Jul-11	172	138	37	347

workers implement quarterly campaigns of VAS and deworming and nutrition screening of all under-fives and pregnant and lactating women (PLW), with referral as necessary. The CHD mechanism was used as the screening/referral mechanism through 2015 and the first quarter of 2016. At the start of the second quarter, the Government agreed to increase screening by health extension workers (HEWs) to a monthly schedule in all priority 1 districts in Amhara, SNNPR, Oromia, and Tigray regions to improve timely admission and reduce food-sharing at household level. In practice, capacity challenges in many districts, particularly Afar and Somali regions, delayed screening, hotspot classification and consequently response.

Management of moderate acute malnutrition (MAM): WFP supports the Disaster Risk Management and Food Security Sector (NDRMC) to deliver supplementary rations of corn-soya blend (CSB) and oil to MAM cases. In 2016, WFP was responsible for the provision of targeted supplementary food (TSF) rations for all priority 1 districts; rations were distributed through existing government systems. Since monthly screening began in Q2, delayed submission of information to WFP delayed WFP distribution of commodities to the affected population scheduled for the first quarter of the response and impacted on the formal release of the updated list of priority hotspot woredas by the Government. When released, the number of priority 1 districts had increased considerably, from 186 in December 2015 to 219 in March 2016.

Infant and young child feeding (IYCF): UNICEF and a number of nutrition agencies identified gaps in IYCF programming and in January 2016 UNICEF requested a technical rapid response team specialist⁴ on IYCF in emergencies (IYCF-E). Several tools were developed, including guidance for Mother-Baby Areas and Mother-to-Mother Support Groups, an IYCF-E curriculum module for HEWs, and an IYCF-E multi-sector integration document. A workshop was organised with several ENCU members, which oriented the development of a national IYCF-E workplan.

Beneficiaries reached in 2015/2016 response

The nutrition situation and response was closely monitored by MOH/ENCU/ NDRMC in collaboration with nutrition partners using monthly TFP admissions, ad hoc surveys, updating hotspot woreda lists and examining nutrition responses. Analysis of these data indicated that the nutrition situation deteriorated considerably in most of the El Niño-affected districts of Somali, Afar, Amara, Oromia and SNNPR. A total of 195,351 SAM cases were admitted in over 14,568 TFP sites between January 2016 and July 2016 (88.6% reporting rate; see Table 4). This comprised 33,817 cases in SNNPR; 88,270 in Oromia; 18,368 in Somali region; 29,086 in Amhara; 16,669 in Afar; 6,868 in Tigray; and 2,273 in other regions. By the end of the third quarter of 2016, the TSFP had reached 1,208,917 moderately malnourished children and 1,258,718 PLW.

Comparing actual and projected caseloads in the first semester 2016, the total TFP admissions between January to June 2016 was 173,105 (89.1% reporting rate), 23.5% less than the projected caseload (226,400) for that period (Humanitarian Requirements Document (HRD), June 2016). The projection prevalence was estimated based on existing screening data (coverage above 80%) from the second round of 2015 screening data (July to December 2015) and taking into account hotspot classification. Taking into account the context, response and underlying causes of malnutrition from July-December 2015 and based on the projections for the future context and underlying causes of malnutrition, prevalence increased by a factor of 2. Incidence was estimated, based on historical programme data: MAM in-

cidence of 1.6 and SAM incidence of 2.6. The actual SAM caseload was affected by seasonal variation in SAM admissions due to MAM treatment (most MAM cases was treated during the second and third quarter and contributed to less SAM caseloads). Some SAM admissions were not captured (89.1% reporting rate).

Key areas of difference between 2011 and 2016 responses

Table 5 outlines the distinguishing features between the 2011 and 2016 drought responses. In the 2016 response, there were more trained manpower/nutrition staff to focus on emergency nutrition. Recognition of community engagement as a key service delivery strategy was demonstrated by a strong community outreach support system, involving HEWs and health development armies (HDAs), who played a key role in implementation of government services. This is a reflection of capacity-building by FMOH and nutrition partners from 2011 onwards. As a result, many more children were screened in 2016 (13 million) compared to 2011 (3.3 million) and nutrition partners could respond by reinforcing existing community systems, rather than setting up new ones. Another important area of progress in the 2016 response was the inclusion of IYCF-E in the planning and emergency resource mobilisation and allocation. IYCF-E was also included in some priority response areas, although later than warranted. Government leadership and coordination was much stronger in 2016, and significant government resources were allocated; government provided over US\$200 million of emergency support, including a first instalment of US\$97 million to support food distribution in early 2016⁵.

Challenges and lessons learned

Ethiopia has made steady progress over the last ten years, dramatically improving child and maternal mortality and making huge strides towards globally agreed targets. While drought increased the vulnerability of millions of people, the 2016 government-led response, with strong UN, NGO and donor support, ensured recovery in the hardest-hit communities and has helped build longer-term resilience of systems and people.

⁴ <http://techrrt.org/>

⁵ Periodic Monitoring Report 2016. Humanitarian Requirements Document, Ethiopia, covering 1 Jan to 30 June 2016.

Table 4 National monthly TFP admissions and performance (Jan-July 2016)

Country	Month	Admission	Cure	Death	Default	Non-responsive (NR)	Medical Transfer (MT)	Total discharge	% Cure	% Death	% Default	% NR	% MT
Ethiopia	Jan-16	27,081	28,184	58	507	180	272	30,462	92.5%	0.2%	1.7%	0.6%	0.9%
	Feb-16	29,738	27,016	56	568	201	283	29,495	91.6%	0.2%	1.9%	0.7%	1.0%
	Mar-16	31,047	26,471	41	464	150	309	28,984	91.3%	0.1%	1.6%	0.5%	1.1%
	Apr-16	29,336	24,760	40	509	154	306	27,471	90.1%	0.1%	1.9%	0.6%	1.1%
	May-16	28,706	26,471	48	503	159	300	29,024	91.2%	0.2%	1.7%	0.5%	1.0%
	Jun-16	27,197	25,385	64	458	161	230	27,979	90.7%	0.2%	1.6%	0.6%	0.8%
	Jul-16	22,246	21,700	70	473	69	242	24,193	89.7%	0.3%	2.0%	0.3%	1.0%
		195,351	179,987	377	3,482	1,074	1,942	197,608					

Table 5 Main differences in 2016 and 2011 drought responses

	Package/benchmark (simplified parameter)	2016	2011
Emergency nutrition response	<ol style="list-style-type: none"> 1. Community mobilisation and active acute malnutrition case finding 2. Treatment of MAM (SFP; either blanket or targeted) 3. Treatment of SAM (OTP; without complications) 4. Referral of SAM (with complications) 5. Provision of VAS 6. Provision of micronutrient powders 7. Monitoring of breastmilk substitutes (BMS) distribution 8. Provision of IYCF-E package <ol style="list-style-type: none"> a. IYCF Rapid and Full Assessment b. IYCF Counselling (one-on-one) c. Skilled support to early initiation of breastfeeding d. IYCF support to children in difficult circumstances e. Support and follow-up of children aged 6 to 23 months enrolled in the CMAM programme f. Support feeding of infants <6 months in SC g. Monitoring of BMS distribution 	<p>Nutrition partners provided minimal support, mostly technical and logistical, as CMAM services were delivered directly through the Health Extension Programme to treat SAM.</p> <p>Provision of IYCF-E package across the response, although inconsistently applied.</p> <p>Monthly Mid Upper Arm Circumference (MUAC) screening.</p> <p>WFP provided supplementary food for three months to most of the priority 1 districts implemented by government structures.</p> <p>Mobile health and nutrition service for hard-to-reach areas of Afar and Somali.</p>	<p>Nutrition partners provided full support of CMAM services, often directly and replacing HEWS.</p> <p>No provision of IYCF-E package, as routine IYCF activities are delivered through the health extension programme package.</p> <p>Quarterly MUAC screening (Enhanced Outreach Strategy).</p> <p>Nutrition partners provided supplementary food in coordination with WFP.</p> <p>Mobile health and nutrition service for hard-to-reach areas of Afar and Somali.</p>
Coordination of emergency nutrition responses in hotspot district	Effective coordination, monitoring and supervision of nutrition package to ensure prevention of gaps and overlap and maximise opportunities for inter-sector integration.	The Government activated the MAC and ICS and sector taskforces. Nutrition and health assistance coordinated by FMOH with support from the Health and Nutrition Taskforce and ENCU.	The nutrition assistance was coordinated by ENCU with support from the health and nutrition task force and NDRMC.
Number of SAM admissions		195,351 ⁶ (6 months)	250,538 ⁷ (9 months)
Number of MAM admissions (< 5 years old)		1,208,917 ⁸	618,924 ⁹
Number of MAM admissions (PLW)		1,258,718	319,076
Performance of emergency TFP services in Ethiopia	Benchmarks (national guideline): Cure rate>75%; Death rate<5% and defaulter rate<15%.	Cure rate 91.1%; death rate 0.2%; defaulter rate 1.8% ¹⁰	Cure rate 83.8%; death rate 0.6%; defaulter rate 4.3% ¹¹

Resource shortfalls constrained humanitarian operations during the first half of 2016; in particular in Amhara, Oromia and Tigray regions that did not receive TSFP during quarter 1 due to commodity-distribution delays related to information delays. The growing food insecurity challenges necessitated urgent reinforcement of response efforts and scaling-up of operations by all actors, including mobilisation of additional resources.

One key intervention area was the service delivery mechanisms to provide treatment for SAM cases. Humanitarian partners supported health facilities, with HEWs providing the service. However, given the high caseload, nutrition partners could have considered a fuller provision of CMAM services, especially for priority 1 districts. This approach would have helped HEWs focus on routine activities and protect the community element of SAM treatment.

It is important that responses in hotspots do not focus solely on health facilities and that the emergency response is comprehensive; in both 2011 and 2016 most nutrition partners focused on treatment of severe malnutrition. Key future considerations include integration of emergency nutrition responses with WASH and health where needed; capacity-building of health staff and improvement of infrastructures for provision of TFP services; maximised and more timely IYCF-E support; strengthened monthly nutrition screening and expansion to the worst-affected Afar and Somali regions; and improved monitoring of the response with timely TFP reports and coordinated surveys.

Government and humanitarian actors should invest in clear reporting, referral and follow-up

systems/pathways for cases of nutrition, health and child protection concern; there were gaps in household follow-up of such cases in the 2016 response. Additionally, capacity of the health and nutrition sector at regional, zonal and district levels, including the multi-sector emergency preparedness committees and the emergency rapid response teams, was not adequate and would have benefited from more technical support. For example, the emergency preparedness committees provide nutrition early warning information; however in some regions they did not report increased cases of malnutrition, related to capacity constraints. Continued capacity-strengthening is vital at all levels through training, development of guidelines, technical and financial support and provision of communications materials.

Donors and nutrition agencies were not always able to respond to the hotspot classification updates. The significant increase in priority 1 hotspots in early 2016 (from 186 to 219) came as agencies were still submitting proposals for the previous hotspot caseload. Intervention delays were partly due to the time taken for federal and state authority signatures of necessary regional MoUs. Irregular screening data submission to WFP led to late distribution of supplementary foods for eligible MAM cases, especially in Somali and Afar regions where capacity is particularly lacking. While changing distribution and screening modalities helped, operational and logistics constraints persisted in the face of an accelerated distribution schedule.

Although IYCF-E interventions were implemented in some high-priority districts, they were limited in scope and did not cover all priority districts due to late prioritisation of IYCF-E by donors and most agencies and lack

of agency expertise. IYCF-E interventions were not successfully integrated into OTPs. Development of a minimum response package tool by the NTWG, to harmonise IYCF-E with CMAM programming and other sectors such as child protection would have helped. For future preparedness, it will be vital to organize nationwide IYCF-E trainings to improve the capacity of governments, UN agencies and NGOs.

Conclusion

Responding to the nutritional needs of an emergency-affected population requires a commitment to a coordinated and collaborative approach among a collective of key actors. There was a significant improvement in the 2016 response compared to 2011 in terms of government leadership, national response, and coverage and quality of interventions. Humanitarian nutrition partners' commitment to the country humanitarian coordination mechanism was excellent. Most actions were aligned with agreed priorities, used shared expertise and ensured that the nutrition response was based on sound and informed decision-making. This helped avoid or resolve gaps and duplication. Despite considerable progress, challenges remained. The 2016 response benefitted greatly from lessons learned and subsequent actions taken post-2011 drought; lessons from 2016 should inform preparedness and future response.

For more information, contact: Getinet Babu, email: g.babu@savethechildren.org.uk

⁶ 2016 UNICEF TFP data Jan-Jul 2016.

⁷ ENCU quarterly bulletin; total TFP Admissions, Jan-Sep, 2011.

⁸ 2016 WFP TSFP data Jan-Oct 2016.

⁹ ENCU quarterly bulletin; total MAM Admissions Jan-Sep, 2011.

¹⁰ 2016 UNICEF TFP data Jan-Sep 2016.

¹¹ 2011 ENCU report for 2nd & 3rd quarter.

Impact evaluation of Realigning Agriculture to Improve Nutrition (RAIN) project in Zambia

Summary of evaluationⁱ

RAIN Project in Zambia



Concern Worldwide

Location: Zambia

What we know: Evidence is lacking on the impact of agricultural interventions, alone or combined with nutrition and health interventions, on child nutrition and stunting prevalence.

What this article adds: A rigorous impact evaluation of the Realigning Agriculture to Improve Nutrition (RAIN) project in Zambia was conducted to examine nutrition impact of two interventions (agriculture-only and agriculture-nutrition) on children under two years of age. Interventions were delivered to mothers by new Smallholder Model Farmers (agriculture) and existing Community Health Volunteers (nutrition) via community groups and home visits. Impacts were mixed. No impact was found on: stunting prevalence (primary objective), which declined in all three groups; IYCF practices; caregiver health; and nutrition knowledge. Positive impacts were found on: agricultural production; women's empowerment; household food security; and child wasting (Ag-only study arm). Low participation of target mothers, especially around health; low delivery of groups and home visits, especially by CHWs; and general improvements in government health services may partly explain findings.

Introduction

The Realigning Agriculture to Improve Nutrition (RAIN) project (2011 to 2015) designed, implemented and evaluated a model of multi-sectoral integration of agriculture, nutrition and health interventions to reduce stunting in children. It involved a partnership between Concern Worldwide, Mumbwa Child Development Agency (MCDA) and the International Food Policy Research Institute (IFPRI). The project was set in Mumbwa district in Zambia's Central Province, and aimed to increase year-round availability of, and access to, nutrient-rich food at the household level. It targeted children during the critical first 1,000-day period from conception to 24 months of age. Community-based interventions were delivered to mothers in the programme by two cadre: female Smallholder Model Farmers (SMFs), who passed on agricultural trainings and inputs to groups during monthly meetings; and existing Community Health Vol-

unteers (CHVs) who received additional nutrition and health training that was delivered to groups.

The project involved a unique, integrated model that realigned service delivery at district, extension and community levels to promote synergy and optimise impact on stunting. A rigorous evaluation was included to document process and impact to inform replication and scale-up.

RAIN evaluation: objectives, design and analyses

The primary objective was to assess the impact of two different RAIN intervention packages (Agriculture only and Agriculture-Nutrition) on stunting among children aged 24-59 months, who were exposed to the RAIN interventions for the maximum period of time. To capture impacts of the RAIN project on key infant and young child feeding (IYCF), children between 0-23 months of age were also sampled. Other

secondary objectives assessed included maternal nutrition and health knowledge, women's empowerment and agricultural production.

The RAIN project evaluation was a hybrid, cluster-randomised design with two intervention groups and a non-randomised comparison group. The three study arms were:

1. **Agriculture only (Ag-only) group**, which included agricultural interventions implemented by Concern Worldwide and its partners.
2. **Agriculture-Nutrition (Ag-Nutrition) group**, which included both agriculture and nutrition/health interventions implemented by Concern Worldwide and its partners.
3. **Control group**, which had access to standard government agriculture and health services, and where Concern Worldwide carried out no implementation activities.

Sample size estimates were powered to detect a reduction in the prevalence of stunting of eight percentage points and a 0.2 z-score difference in the mean height-for-age z-score (HAZ) between any two study groups. About 1,000 households per arm with a child aged 24-59 months were sampled at baseline for a total sample size of 3,044 households. At endline, the two RAIN intervention arms were oversampled by approximately 20% (a sample size of 1,200 households per arm) to account for potential limited intervention exposure at the household level (a total sample size of 3,536 households). Data collection included a household questionnaire, collecting

ⁱ Jody Harris, Phuong Hong Nguyen, John Maluccio, Adam Rosenberg, Lan Tran Mai, Wahid Quabli and Rahul Rawat (2016). Realigning Agriculture to Improve Nutrition (RAIN) project: Impact evaluation report. International Food Policy Research Institute (IFPRI): Washington DC. www.concern.net/sites/default/files/media/resource/rain_endline_survey_report_final_version_may_2016.pdf

information on nutrition outcomes and determinants of malnutrition at the child, maternal and household level, and child anthropometric measurements.

Three sets of analyses were conducted:

- Estimation of impact of the RAIN intervention arms compared to the Control group and to each other on the primary impact indicator (stunting).
- Estimation of impact of the RAIN interventions on secondary outcomes, i.e. IYCF practices; maternal nutrition and health knowledge; women's empowerment; and agricultural production.
- Decomposition analysis to examine various social, behavioural and economic factors as potential drivers of change in linear growth and stunting over time.

Results

Intended exposure to the project interventions was defined as participation (whether and to what extent a household was participating in RAIN project components) and delivery (RAIN implementation being received as planned). Overall participation was 31% in the Ag-only group and 34% in the Ag-Nutrition group; approximately 50% of all households receiving medium or high levels of programme delivery. In terms of intensity of delivery, SMF attendance at RAIN groups was high (approximately 90%), but CHV attendance was low (38-45%). Additional home visits to provide one-to-one support for gardening and IYCF counselling and support were more limited still: SMF home visits were not happening as often as planned (45% and 53% of households were visited by an SMF in 2015 in the Ag-Nutrition and Ag-only arms, respectively), and CHV visits occurred even less often (13% in the Ag-Nutrition arm).

Programme impacts

Nutritional status

The prevalence of stunting decreased significantly in all three study groups of children aged 24-59 months. However, the differential decline in

stunting was in favour of the control group, with a significantly greater decrease compared to both RAIN interventions groups. This suggests a null impact of the RAIN project interventions on stunting during the 1,000 days window of opportunity. Levels of wasting increased significantly over time for all three study groups, although analysis suggests the Ag-only study arm had an overall protective effect on wasting.

Respondents' perception of their household food security (using the household hunger scale) decreased significantly over time for all groups and among confirmed RAIN beneficiaries. There was a significant decrease in the prevalence of "little to no hunger" in the Ag-Nutrition group compared to the Control group, and a significant increase in the level of "moderate hunger" in this group. At the same time, the Ag-Nutrition group had significant positive impacts on household dietary diversity, with an increase of about one food group, based on a 12-food group scale.

IYCF

All breastfeeding-related IYCF indicators were high across all three study groups at endline, but complementary feeding practices were sub-optimal, ranging from approximately 25-30% for the minimum acceptable diet to 60% for minimum meal frequency. Overall, there was no attributable programme impact on improving IYCF practices in both intent-to-treat and per protocol analyses; the only impact was higher consumption of legumes/nuts in both intervention arms compared to control.

Caregiver health and nutrition knowledge

Overall, IYCF knowledge increased over time; improvements in breastfeeding knowledge over time were significantly lower in the Ag-only group when compared to the Control group. The knowledge of timely introduction of complementary food was significantly higher in the Ag-Nutrition arm compared to the control arm; this was most notable for animal-source foods.

Women's empowerment

There were clear impacts of the RAIN interventions on different domains of women's empowerment. In particular, significant programme impacts were found in the Ag-only group compared to the Control group on social capital, asset access, financial empowerment and perception of equality. The Ag-Nutrition group had significant programme impacts compared to the control group on social capital only. There was a clear shift over time in women's involvement in decision-making in agriculture across all study groups, with greater change in the RAIN intervention groups compared to the control group.

Agriculture production

Overall, the RAIN interventions had a significant impact on several different dimensions of agricultural production and availability of nutritious foods during the year. Both the Ag-Nutrition and the Ag-only arms had greater increases over time compared to the control group on the total number of foods produced, total number of agricultural activities engaged in by the house-

holds and number of months producing vitamin A-rich foods and dairy.

Discussion and conclusion

Overall, the RAIN project had mixed impacts. No discernable impacts were found on reducing the prevalence of stunting, improving IYCF practices or improving caregiver health and nutrition knowledge. The project had consistently positive impacts on agricultural production; impacts on different domains of women's social and economic empowerment and women's empowerment in agriculture; impacts on household food security as measured by household dietary diversity, and a potential protective effect on child wasting.

In general, where there were significant programme impacts, the magnitude was larger in per-protocol analyses among confirmed RAIN beneficiaries. There appears to be little to no additional benefit of the Ag-Nutrition arm compared to the Ag-only intervention arm for the impacts achieved.

Low programme coverage is one possible factor contributing to the lack of consistent impacts. Only a third of eligible households surveyed had joined a women's group, the main point of entry into the RAIN project. Home visits by SMFs and CHVs, a critical component, were also lower than anticipated. Agriculture frontline workers (SMFs) were more active than the health workers (CHVs) in groups and home visits, which is reflected in the improved agriculture outcomes compared to nutrition and health outcomes. Only 12-16% of households had both high participation and high levels of programme delivery.

The SMFs, a position created specifically for the RAIN project, were initially more incentivised through RAIN's provision of agricultural inputs than the CHV positions that already existed in the community and which did not receive similar incentives until after 2014. In addition, CHVs serviced the entire community, whereas SMFs were working specifically with RAIN groups, and information provided by SMFs was novel, while CHVs delivered existing messages.

Study design limitations include the inability to accurately account for elements beyond the RAIN project interventions, such as general improvements in government health services across the district. Between baseline and endline, there was increased access and use of government-run health services across all study groups, as well as receipt of health and nutrition counselling services. It is plausible that these directly impacted health and nutrition knowledge and IYCF practices to a degree that prevented detection and attribution of RAIN interventions, over and beyond general increases.

In conclusion, the results of RAIN's impact evaluation contribute important lessons to the limited evidence to date from similar interventions. Of particular note are the impact of the RAIN intervention on agriculture production and women's empowerment.



RAIN Project in Zambia

Concern Worldwide

Agency profile

ADRA_DRC



Name:	ADRA (Adventist Development Relief Agency)
Address:	12501 Old Columbia Pike, Silver Spring, Maryland, 20904, USA
Email:	sonya.funna@adra.org
Website:	www.adra.org
Year founded:	1956
President:	Jonathan Duffy
No. of HQ staff:	100
No. of staff worldwide:	5,000+



ENN interviewed Sonya Funna Evelyn, Senior Director of Programs and Innovation at ADRA International, and Natsayi Nembaware, the Senior Technical Advisor for Nutrition at ADRA International (Maryland, US). Sonya has worked for ADRA for over nine years, while Natsayi took up her post in July 2015.

The Seventh-day Adventist Welfare Services (SAWS – the first iteration of ADRA) was formed in 1956 in response to disasters in South America and the Middle East. During the late 1950s and '60s, SAWS mainly responded to emergencies and worked through its church structures in up to 35 countries. Funding came from humanitarian donor agencies and private contributions. In the mid-1980s, SAWS began changing its focus to longer-term and sustainable development, as well as responding to emergencies, and became the Adventist Development and Relief Agency (ADRA), which now works in 139 countries. ADRA offices range from very small (five staff or less) to very large (600 plus). This shift towards a developmental approach was underpinned by improving access to longer-term, development-type funding, as well as the desire to have a more sustainable impact on poverty and vulnerability. ADRA has over 20 support offices that are involved in fundraising for the organisation, with programming often supported by multiple donors. For example, in one country office there can be multiple ADRA donor offices supporting programming.

ADRA operates as a community-based development agency and focuses predominantly on five sectors: health, nutrition, WASH (water, sanitation and hygiene), education and agricultural and livelihoods. Many ADRA programmes are integrated and holistic in nature, and address key determinants that lead to poverty and lack of well-being. In humanitarian contexts, the predominant sectors of focus are shelter and WASH. The integrated approach requires planning with all sectors at the outset. Where possible, those

planning interventions are encouraged to adopt a nutrition lens, e.g. considering dietary diversity and homestead food production as part of agricultural programming. ADRA often innovates or adapts programmes to context, but always with an eye to an exit strategy and the belief that government or other development partners will take over programming. Where possible, government (at central, regional and local levels) is involved in programme design and set-up. ADRA “thinks about the end right at the beginning” and programme designs are based on analysis of the barriers to desirable outcomes.

Nutrition has always been a key focus of ADRA. Although in the past it has usually been a component of health programming, it is now becoming a sector in its own right. ADRA undertakes a wide range of nutrition programming. Infant and young child feeding (IYCF) and maternal nutrition are a core part of programming, often delivered through mother’s and/or father’s groups. Programming often includes training of community health workers (CHWs) in growth monitoring and referral, taking place at facility level. ADRA is also involved in micronutrient supplementation programmes and support to antenatal and postnatal care services. In emergencies, the focus tends to be on IYCF, although provision of foods are also common, e.g. corn soya blend (CSB), cereals and pulses, as well as cash voucher programmes. ADRA has also implemented Community-based Management of Acute Malnutrition (CMAM), for example in Ethiopia, and moderate acute malnutrition (MAM) programmes, e.g. in Madagascar.

ADRA utilises SPHERE standards to assess programme effectiveness and has a number of technical working groups (TWGs) that bring together experts from different countries. There are currently seven TWGs which attempt to synthesise agency working experiences, including sharing resources and guidance developed by programmes. In the near future, these TWGs will be further rationalised to four (health, education, DRR (disaster risk reduction) and livelihoods). They will maintain a similar internal knowledge-management function. There is an online facility whereby countries can share information, as well as a quarterly newsletter that highlights research and TWG findings. ADRA

also conducts primary research, often in collaboration with research institutions such as academia. At global level, ADRA belongs to other technical groups and umbrella organisations like the Core Group (www.coregroup.org).

In emergencies, ADRA typically works as part of the nutrition cluster coordination mechanism. At global level, it is a member of the global nutrition cluster (GNC). Natsayi says they are seeing increasing levels of conflict and disaster globally and very often, nutrition may not be seen as a priority by donors and other stakeholders. IYCF is a real challenge in emergencies, especially where there are migrant populations in transit, and the unpredictable impact of climate change is problematic as they are witnessing protracted droughts and flooding in many countries. Both Sonya and Natsayi see governance as critical to effecting an adequate nutrition response, while preparedness in these contexts has to be strengthened. ADRA knows that communities contribute a lot in these contexts and that it is important to tap into their experience and learn from it. Communities know about resilience.

ADRA is a unique, faith-based organisation and both Natsayi and Sonya explained that their connection to the church often enables a response in conflict situations where other agencies cannot respond. Churches are based in the community and have an intrinsic network which can be accessed and deployed to good effect. At the same time, the religious element or basis of ADRA is completely independent from the practical development and emergency work the organisation does. While ADRA’s faith and belief system may provide motivation and encouragement to staff, the programming is entirely technical and has no religious elements. Sonya and Natsayi emphasised that ADRA’s overriding aim is to reach and support the most vulnerable populations and that they are just as likely to support populations of Islamic faith as they are to support Methodists or Adventists.

The interview left us with a strong sense of ADRA as an organisation with integrated, community-driven action at the heart of emergency response. We look forward to featuring some of the organisation’s learning in Field Exchange in 2017.

Mercy Corps cash programming in the Greece migrant crisis response

By Alan Glasgow



Alan Glasgow is Mercy Corps Director of the European Migration Response. In 2015, Mercy Corps established its European Migration

Response to meet the urgent needs of thousands of refugees and migrants who were travelling from Turkey to Greece and through the Balkans.



Hassan and his family receive a cash transfer from Mercy Corps staff members in Katsikas camp, Ionnina

Sara Hylton for Mercy Corps

Location: *Greece*

What we know: Cash as a humanitarian response mechanism has grown in significance over the last decade.

What this article adds: In response to the Greece migrant crisis, Mercy Corps responded in 2014 with a clear strategy for a cash-based response, informed by recent experiences and enabled by government collaboration and private sector support and partnerships. Support of Mastercard allowed for start-up and innovation on the use of cash in a highly complex and fluid situation to meet the needs and the context. Mercy Corps is now responsible for roughly 25% of all cash programming among the refugee response in Greece and its islands (distributing €600,000/month). Over half of cash (54%) is spent on food. Cash programming has allowed for greater dignity, autonomy and cultural sensitivity to needs. Learning informed other agency and donors responses; a cash working group now coordinates response and the shared distribution mechanism makes for an efficient, equitable response.

From 2014 onwards, Greece and its islands faced a challenge like they have never previously encountered and for which they, and the humanitarian community, were ill-prepared. Wars and economic crises in countries across the Mediterranean Sea and beyond, resulted in a tide of people on the move across the globe on an unprecedented scale. Greece, with its position as a gateway to a prosperous and stable Europe, became the one of the first shores upon which waves of citizens landed, displaced and in possession of only that which they could carry.

When Mercy Corps arrived in Greece in August 2015 to assess the conditions and begin to

provide support in helping refugees and the Greek people face this modern crisis, thousands of people were moving through the country each day, onwards to find refuge in other European countries. In our rapid assessment of the situation, our staff and volunteers on the island asked themselves, “how can we provide for a transient population who can only use what they can carry?”

Cash

Using our expertise in the humanitarian sector, and the growing significance of using cash in the humanitarian context for the past decade, the answer was surprisingly simple – to give refugees the money to buy what they need,

when and where they needed it. Pre-paid cards provided to each family unit or individual refugee or migrant, pre-loaded with a monthly sum with which they could buy the items they and their family needed.

Cash as a humanitarian response mechanism has been growing in significance for more than a decade, with Mercy Corps first implementing it in response to the Indian Ocean tsunami in 2004. We made the strong case for cash programming as a best fit for dealing with the crisis in Greece and we were the first organisation to start using cash in the country. As an organisation, we took a stance that said that people have the right to move and claim asylum where they

wish to do so, and cash helps to protect them and do so in a more dignified way.

We used the blueprint from smaller programming we were running in Serbia and Macedonia, we moved it over to Greece and scaled it up. Initially, because of good links with the local government and with the help of partners such as Airbnb, Google.org, Mastercard, TripAdvisor Charitable Foundation and private philanthropists who generously supported Mercy Corps' innovative approach to this humanitarian situation, we were able to push ahead with the type of programming that we recognised matched the nature of the crisis most.

As a firm believer in the efficacy of cash programming, over the last decade, Mercy Corps has implemented schemes in 31 countries including Syria, Ukraine, Haiti, Niger, Yemen and Uganda. Indeed, since 2014 we have distributed over £36 million in cash programming to more than 400,000 households. In each context, an assessment is undertaken to determine whether local markets are suitably functioning to undertake cash programming and, if so, which form will be most efficient. One of the many advantages of this practice is that it can be adapted depending on the needs of the people and situation. Some examples include distribution of paper vouchers, mobile money transfers, or pre-paid debit cards that can be used to withdraw cash around the world. Some programmes even include cash-for-work initiatives.

When our programming first began on the two Greek islands, it was a light touch response to complement the responses from volunteer-led, and other organisations, which were already underway. Beginning on the islands of Lesbos and Kos, refugees were spending all of two or three days in Greece as they transited on towards northern Europe. Their 'expenditure basket' (the amount of money received per individual) was primarily calculated on the basis of the cost of a ferry ticket to mainland Greece.

Box 1 Walaa's story

One family that cash has helped in Greece is Walaa and her children. After a rocket landed on their house and set it on fire, along with her eight month old daughter Fatima, Walaa knew that they had to escape Syria. She fled in early 2016 with her three children. They walked across the desert for two days to Turkey's border, where smugglers took them across the country and the Aegean Sea. They arrived in Greece on the 19 March, one day before the EU-Turkey deal came into effect.

Walaa's children will carry their scars for years but with the Mercy Corps cash support, she can afford to buy some healthy food, especially for Fatima as she needs special, soft food, since she has difficulty chewing and swallowing, and clean clothes for the children. Two years after the attack, Fatima cannot speak, hear or walk. Half of her head is covered in scar tissue where her hair never grew, and her legs are covered with the web-like scarring of burned skin. She needs a special stroller to stretch out her legs and have a better quality of life. Walaa also uses the cash to create little moments of joy for the children, such as purchasing a treat of peanuts and soda for her other children. "So they can forget the hunger and the horrible days they've lived. So they can be happy," she told our team.

Initially, the programme targeted the most vulnerable cases, which saw over 1,600 cards distributed in the first six months of the programme benefiting more than 3,500 individuals. Cards for adults were topped up with €90 and for families, €250 and saw, €291,700 being distributed. In doing so, we aimed to reduce the negative coping mechanisms that those under stress may have felt the need to turn to. While the Greek government was providing food and shelter, some people had no source of income for transportation, medicines and additional food so there was a concern that some might turn to other ways of coping such as drugs, prostitution, and violence.

When things changed

Then in March 2016, the anticipated EU-Turkey deal was struck between the European Union and Turkey. This followed the closing of borders by some European countries, and radically changed the nature of the crisis. According to the deal, Turkey agreed to send one Syrian refugee to Europe for permanent resettlement in return for accepting one refugee or migrant

who entered Greece by crossing the Aegean Sea. This had the effect of closing the Greek route into Europe, halting the flow of refugees and migrants through the country, turning the transient population into a static one.

The deal had various implications on Mercy Corps' programming. With the halting of the journey of many refugees and migrants, they effectively became stuck in Greece and therefore Mercy Corps had to pivot the programme quickly from targeting the most vulnerable, to all individuals in the camps who Mercy Corps was responsible for helping. Part of this decision involved the recognition that refugees and migrants living in such proximity to one another made it practically impossible to isolate certain individual for cash programming without creating a level of tension among the residents of the refugee camps.

Mercy Corps was the first organisation to set up cash programming in Greece, from our cash office in Lesbos we met families like Walaa's (see Box 1) on a daily basis. We undertook distributions in camps across Greece – on the islands, in Attica and in the northwest district of Ioannina. Depending on size, families receive up to €340 each month via a pre-paid card, while an individual receives €90 a month. They can withdraw the money to spend in local markets and shops, or could use it in any place where there is a POS (point of sale) machine and the card is topped up each month following an interview and analysis of needs.

As we shared our learnings with other agencies and the UNCHR, gradually they began following Mercy Corps' leadership, along with other donors, including the European Commission's Humanitarian Aid and Civil Protection department (ECHO).

Overcoming challenges

A key partner of Mercy Corps cash efforts until December 2016 was Mastercard, who gifted us free cards and helped set up a cost-efficient delivery mechanism. While initially we had hoped to be able to capture POS information for all those using the cards, due to the scale of the



Walaa, 23, and her three children were (May 2016) living in a hotel designated as a camp for the most vulnerable refugees

programme, we had to adjust our monitoring and evaluation methods. This meant that part of the process included interviews with refugees and migrants each month before and after they received their cards in order to analyse their spending habits and the impact that the card were having on meeting their basic needs.

Through this data analysis, we have been able to track the changes over time and within groups in how the funds are used. Although food is provided at the camps which are run by the Greek Government, buying additional food remains the majority use of the money, standing at 54 per cent in the November 2016 report, clothing at 15 per cent, communication on 9.5 per cent, medical expenses at 6.5 per cent and after that transport and miscellaneous costs come in. Ninety-five per cent of cardholders said in November 2016 that their safety has either improved (60 per cent) or remained stable (30 per cent) due to the receipt of cash.

Implementing the scheme across different demographics, nationalities and social groups has required that staff think flexibly to overcome challenges. We can often have up to 20 different nationalities arriving on the islands and Mercy Corps has staff to cover five of the main languages spoken: Arabic, Farsi, Urdu, French and English. It is an unusual situation to have this many different languages in one place and to have to programme accordingly. In addition, there are different capacities which different people have to use the electronic cards and machines, and our training accompanies any cash distribution.

Unaccompanied minors (under 18 years) are another group to be considered, and they currently receive alternative assistance such as accompanied shopping or a gift card or voucher to spend.

Through our cash transfer programme in Greece, we have seen the dignity and autonomy that the cash has provided refugees, allowing individuals to spend their money and how social differences such as gender and culture affect spending habits. Women spend relatively more on clothes and medicines while men have higher rates in transportation and communications. Afghans have higher expenditures in clothing, and medical expenses, Pakistanis in communication and Syrians on food.

In Ramadan we saw families saving up their money to go out and eat in the evenings at a restaurant; the cash gives some sense of normality to their existence instead of living simply off of government and army handouts.

Mercy Corps is now responsible for roughly 25 per cent of all cash programming among the refugee response in Greece and its islands, currently distributing around €600,000 a month at our seven locations. Since December 2015 a total of 16,828 beneficiaries have received a share of €2,849,100 on the Greek mainland and islands. This money not only provides dignity and choice to refugees and migrants, but supports the local economy – shops and markets – as

well as the livelihoods of Greek shopkeepers. An additional benefit is the increasing goodwill from shopkeepers who view refugees and migrants with some cash in their pockets as customers and not always as an additional burden.

Harmonising cash programming across Greece

As in many humanitarian settings, organisations in Greece involved in the refugee response have formed working groups to coordinate our activities in order to address common problems. The cash working group collectively sets the ‘expenditure basket’ funds received each month by individuals, and this calculation remains a function of needs established through our collective research. Such is the relative ease of cash distribution that it is much more straightforward to coordinate operations among the organisations at work in the country, making the response quick, efficient and equitable.

The working group is building towards a unified and streamlined response across the different organisations and there is a real desire, especially as more donors are committing more funds to cash, that there is standardisation of cash programming across Greece.

All organisations are now using the same standard operating procedures in order to harmonise cash programming across the country, and we’re now using the same provider called a ‘PFS’ or Prepaid Financial Service, which is a partner of Mastercard. This harmonisation of cash programming across all organisations means that we can provide more joined-up and better services for refugees and migrants receiving cash through the programme, even if they should move from camp to camp.

Cash for the future

It is not news that globally, there is unprecedented humanitarian need – the world is spending around £15 billion a year responding to 125 million people devastated by wars and natural

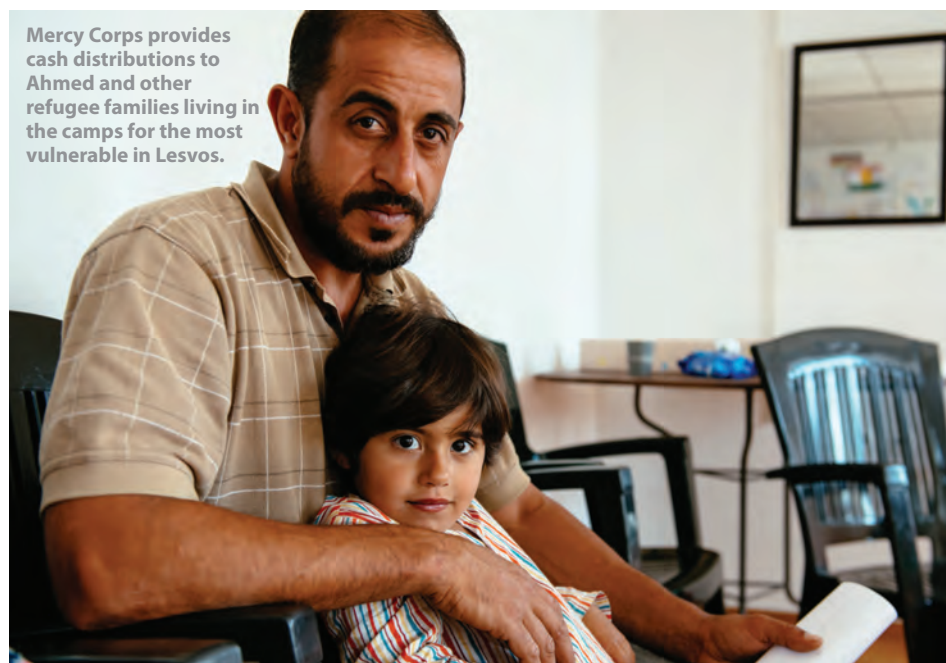
disasters. Unfortunately, we’re not even coming close to keeping up with the needs. But we are also in a time of unprecedented new opportunities: new technologies, new kinds of partnerships with global business, new research into what works (and what doesn’t) and a new profile of those we’re trying to help. Increasingly we are supporting educated, mobile and urban populations. What Mercy Corps was able to do in Greece, with the support of Mastercard, was quickly start-up and trailblaze the use of cash in a highly complex and fluid situation to meet the needs and the context.

In 2016, the UN Secretary General called for cash to be the default method of support for crisis-affected people where the situation allows, and Mercy Corps has committed 25 per cent of our humanitarian programming to cash by 2018. While cash is largely accepted as a form of humanitarian response, we must do more to ensure that it is considered as a starting point. Similarly, more must be done to win the public and donors’ trust of accountability around cash.

Mercy Corps firmly believes that cash is an integral component to bridging the divide between urgent relief and longer-term recovery and we are working to improve the policy environment for increasing cash-based assistance through the World Economic Forum’s principles for public private partnerships.

Time and time again, when we ask people who are benefiting from Mercy Corps’ cash programme, what difference it makes to them – they say that the little amount of money “helps them to live”. They don’t always mean literally, but rather it support their well-being, allows them to feel some sense of normalcy and hopeful about their options. For a programme that already makes good economic sense, this furthers its tremendous value.

For more information, contact: Amy Fairbairn, Media and Communications Manager, email: afairbairn@mercycorps.org



Mercy Corps provides cash distributions to Ahmed and other refugee families living in the camps for the most vulnerable in Lesbos.

Mastercard experiences during the humanitarian response in southern Europe

By Paul Musser and Sasha Kapadia



Paul Musser is Senior Vice President of Humanitarian, Development & Donors, Mastercard. Paul Musser leads

the team responsible for Mastercard's humanitarian and development solutions. His work focuses on creating and implementing innovative business models and technology solutions leveraging a shared value approach. His clients and partners include UN agencies, international NGOs and funders. Current examples of projects he and his colleagues are working on include the Mastercard Lab for Financial Inclusion in Kenya, commercialising the new electronic aid voucher service known as Mastercard Aid Network, and developing new approaches to data privacy, identity and financial inclusion enablement. Musser possesses more than two decades of payment and senior leadership expertise.



Sasha Kapadia serves as Director, International Development, in Mastercard's Public Private Partnerships

division. In her role, she works with humanitarian and development organisations to jointly deploy programmes that showcase the ability of electronic payments to transform lives. Notably, she helped build the Mastercard Aid Network, a digital voucher platform designed to work in remote areas, and launch prepaid programmes for refugees in Southern Europe. Prior to Mastercard, she worked at the U.S. Department of State in the Office of Afghanistan Affairs and the German Marshall Fund of the United States. She is a graduate of the Fletcher School, where she focused on fragile and failed state development, and New York University.

Following the issue of a cash distribution debit card, a Mercy Corps team member helps Walaa, 23, and her three children withdraw cash from an ATM.



Corinna Robbins for Mercy Corps

Location: Southern Europe

What we know: The private sector is playing an increasing role in the humanitarian and development sectors; one keen area of innovation is around cash programming.

What this article adds: Mastercard has worked with public and non-profit partners to enable safer and more efficient aid (cash) distribution in recent emergencies. Innovations include Mastercard Aid Network, a digital voucher platform, and Mastercard Send, a means to distribute funds via mobile phones. In Southern Europe in 2016, Mercy Corps launched a pilot programme in partnership with Mastercard and the Serbian Ministry of Labour to distribute prepaid debit cards to eligible refugees traveling through Serbia, the first programme in the region. Due to its success, Mercy Corps and Mastercard launched a complementary cash transfer programme in Greece to provide basic assistance to refugees - currently accounting for 25% of all refugee cash programming in Greece and its islands. Going forward, Mastercard sees a focus on the "customer" experience, that of both Mercy Corps and the refugee, as critical to the success of a public-private partnership.

Nearly four years ago, Mastercard brought together a group of aid organisations for a joint workshop under the assumption that the private sector could play an important role in spurring new innovations for the humanitarian and development sector. We quickly discovered that we had a lot to learn about payments in the humanitarian context.

To bridge the knowledge gap, we took the same approach we use with our banking partners - we focused on listening to their needs. That approach has proven to be successful. Working with public and non-profit partners, we have empowered more than 2.5 million vulnerable people - the vast majority of them refugees across Africa, Asia, and Europe in countries including Kenya, Jordan, Lebanon, Serbia, Yemen, Nepal, Ethiopia, Mozambique, Niger, Nigeria, Greece, and the Philippines - through faster, safer and more efficient aid distribution.

Instrumental to our success has been the ability to provide flexible solutions tailored to meet our partners' needs in a variety of contexts. During our consultations with international non-governmental organisations (NGOs), we heard about the difficulty to reach recipients in an effective and efficient way. They needed an aid delivery mechanism that leveraged local economies and enabled recipient choice.

We created the Mastercard Aid Network, a digital voucher platform that utilises chip cards, Android devices, and an easy-to-navigate app, in

response to this need. It helps streamline aid delivery, even in remote environments, since it operates offline and does not require partnerships with additional service providers. Since its launch in the autumn of 2015, the Mastercard Aid Network has been rolled out by Save the Children, the International Rescue Committee, Mercy Corps, and World Vision all around the world.

In a similar vein, we have also adapted our disbursements technology, Mastercard Send, with the American Red Cross to distribute funds to drought-affected families in Indonesia via their mobile phones for the purchase of water and other items. The pilot programme provided a safe and convenient way for beneficiaries to access aid so that participants could spend the funds on what they needed most.

However, it is our prepaid technology that has made the biggest impact on supporting the needs of refugees.

Providing refugees with mobility, flexibility and dignity

In 2013, the World Food Programme (WFP) and Mastercard rolled out a "digital food" programme in Lebanon and Jordan to deliver food assistance to Syrian refugees so they could access food locally through Mastercard branded prepaid cards. Loaded at the beginning of each month, the cards are used to purchase food from more than 400 local shops, boosting the local economy and providing Syrians

with access to fresh produce, dairy products, poultry and meats. Since the money is automatically transferred onto the cards, refugees need not wait in line to receive their benefits.

In Southern Europe beginning in February 2016, Mercy Corps launched a pilot programme in partnership with Mastercard and the Serbian Ministry of Labour to distribute prepaid debit cards to eligible refugees traveling through Serbia. Families received cards with a value of about €210 euros, and individuals approximately €70 euros, and the funds could be used to make purchases to meet immediate needs. Mercy Corps' program was one of the first in the region to use an international cashless payment mechanism to respond to the refugee crisis.

The cards were distributed to Syrians, Iraqis, and Afghans whose travels had taken them to Serbia, with an emphasis on reaching the most vulnerable: people with disabilities, the elderly, women traveling alone and those in financial need. In one case, a woman traveling on her own asked where she could buy eyeglasses upon receiving her card. In another example, a pregnant woman temporarily residing at a refugee camp quickly used her Mastercard prepaid debit card to help feed herself and her unborn child.

The programme was designed so that cards came pre-loaded with the estimated funds families would need to buy essential supplies and obtain shelter over the 72-hour period typically spent in Serbia. During the pilot, approximately €66,900 euros were distributed to nearly 400 families and individuals. Within the first month, more than €52,957 euros was spent on such items as transportation, food, medications and lodging.

Based on the success of the pilot programme in Serbia, Mercy Corps and Mastercard launched a complementary cash transfer programme in Greece in March 2016 to ensure refugees could cover their basic needs. This programme began on the islands of Lesbos and Leros, where nearly 1,000 people living in shelters for extremely vulnerable people were provided with cash assistance via prepaid cards. The programme expanded to five camps on the mainland in Greece. Mercy Corps is now responsible for roughly 25 percent of all cash programming among the refugee response in Greece and its islands, currently distributing around €600,000 a month at seven locations. A total of 16,828 beneficiaries have received a share of €2,849,100 on the Greek mainland and islands.

When we began discussing potential solutions with Mercy Corps for the delivery of aid to refugees, rapid response was the primary factor. Mercy Corps wanted to provide a solution to quickly address refugee needs, so we determined that the best course would be to leverage existing infrastructure.

We identified two potential options: mass distribution of anonymous gift cards or personalised prepaid cards. While the gift cards were attractive because they did not require "Know

Your Customer" (KYC) due diligence, they didn't allow for ATM withdrawals, a must for Mercy Corps. KYC is a process by which financial service providers obtain information about the identity of its customers in order to ensure that services are not misused. In addition, only up to €250 could be loaded onto the gift cards with no option to reload funds. With the personalised prepaid cards, the limit for loads is much higher and programme participants could access ATMs. Only a small amount of information such as name and birthdate would be captured.

At Mastercard we believe innovation not only occurs when you build something new, but can also happen when you are able to leverage existing technology in a new way. Working with Mercy Corps, we modified a programme typically used by employers to distribute employees' wages electronically via a card. In the humanitarian setting, Mercy Corps was the "employer" distributing funds to refugees. Mercy Corps distributed unrestricted cash to refugee recipients via a prepaid debit card. These cards were not branded with Mercy Corps' logo or that of a donor – refugees were indistinguishable from any other payment card holder, providing the dignity of interacting in the local market as locals would. They also had the freedom to use the cards wherever Mastercard is accepted, regardless of geography or type of shop.

The cards were issued in partnership with a bank in the United Kingdom, and Mastercard worked directly with Mercy Corps on the programme implementation. The funds were bulk loaded onto the cards via the Mastercard platform.

What we learned

In August 2016, executives from Mastercard joined Mercy Corps and other corporations, including TripAdvisor and Airbnb, on a field visit to Greece. We wanted to better understand the conditions and needs within the refugee community, assess the impact of our solutions, as well as learn how we could do more. The trip was eye opening.

Nothing can prepare you for such an experience – hearing first-hand accounts from refugees on their plight, abandoning all they knew for safety and protection. For example, while visiting Pikpa, a small but inspiring camp on the island of Lesbos, two small children played in their tent while their mother recounted the harrowing journey from Pakistan, the pain of starvation and losing her father to criminals along the way. She still doesn't know his ultimate fate.

Later we heard the story shared by parents of four boys who, on the day they left Syria, needed to make the unimaginable choice of leaving one 10-year-old behind because he could not be found at the moment they needed to leave. Again, they live with no knowledge of his fate.

Even in these terrible circumstances, there is some relief. Humanitarian organisations are making significant contributions to put lives

back together and help Greeks build inclusive communities for these refugees.

During the trip, we gained fundamental insight into how our prepaid card programme was working on the ground, which will allow us to make improvements and identify best practices for future programmes. Three concepts – the "customer" experience, end-to-end delivery, and need for flexibility – resonated as keys to success.

It goes without saying that operating within a humanitarian context poses unique challenges. We learned that joint implementation with the partner is necessary to ensure sound practices are being followed to minimise risk and create efficiencies.

We found out that our platform should accommodate various needs that arise over the course of the programme. While ATM access was a requirement for programme implementation, cash withdrawals didn't allow for line of sight into how and when the funds were spent. Mercy Corps used the reports from Mastercard's platform to gain insight into programme participant purchases, and as such, the needs of the population. ATM functionality, however, could not be turned off in the midst of the programme, so Mercy Corps relied on self-reported data on cash spending, a less than ideal scenario.

Mercy Corps believes cash-based transfers are the most rapid, efficient and dignified manner of providing humanitarian assistance. Even a small amount of cash lets people choose how they prioritise their individual needs, in addition to offering a measure of protection.

Programmes like Mercy Corps' infuse cash into the local economy, fostering economic and social ties between the host population and refugees. If the money is not immediately spent, it is not lost. The implementing agency can re-allocate the funds for other purposes at a later time. In-kind programmes that distribute food baskets or blankets lack this flexibility.

Over the course of more than a year working together on these prepaid programmes, Mercy Corps and Mastercard made significant strides to improve the lives of refugees, and at the same time, learned critical lessons that can be applied to future programmes. As a result, both organizations have generated industry recognition for their efforts and demonstrated leadership among peers in this space.

With Mastercard's support, Mercy Corps was one of the first international NGOs on the ground to run electronic cash-based programmes. Mercy Corps provided Mastercard with a better understanding of the needs of the sector, which will inform our product development process. In fact, Mastercard is in the process of building a fit for purpose humanitarian prepaid product that incorporates feedback from partners like Mercy Corps and the World Food Programme.

For more information, contact: Sasha Kapadia, Director, International Development, email: sasha.kapadia@mastercard.com

People in aid

UNICEF



Signing of the Declaration of Commitment for implementation of the Nepal Multi-sectoral nutrition plan by high Government officials and development partners (see field article).



Refresher training of health workers on management of severe acute malnutrition in infants under six months of age in the malnutrition ward, Barisal Medical College Hospital, Bangladesh, facilitated by icddr,b scientists (nutrition science division) and national trainers from the hospital (see research article this issue).



Save the Children, Bangladesh

Editorial team **Office Support**
 Jeremy Shoham Claire Reynolds
 Marie McGrath Clara Ramsay
 Judith Hodge Peter Tévret
 Chloe Angood Judith Fitzgerald
 Nick Mickshick Viktorija Nesterovaite

Design
 Orna O'Reilly/Big Cheese Design.com

Website
 Phil Wilks

Contributors for this issue:

Alain Georges Tchamba	Kerstin Hanson
Tine Frank	Cecilia Ferreyra
Emily Keane	Nuria Salse
Natalie Roschnik	Didier Tshialala
Colleen Emary	Cristian Casademont
Melani O'Leary	Rebecca Grais
Laura Snyder	Helena Huerga
Alan Glasgow	Diane Holland
Paul Musser	Paluku Bahwere
Sasha Kapadia	Kate Sadler
Loren Hyatt	Sarah Jones
Linda Shaker-Berbari	Aurélie du Châtelet
Pressila Derjany Khoeiry	Anne-Dominique Israel
Dima Ousta	Elise Rodriguez
Pradiumna Dahal	Wisdom Dube
Anirudra Sharma	Laetitia Battisti
Stanley Chitekwe	Magali Garcia
Amanda Pomeroy-Stevens	Coline Morin
Heather Viland	Natalie Sessions
Sascha Lamstein	Sonya Funna Evelyn
Christoph Andert	Natsayi Nembaware
Zeine Muzeiny	Myriam Ait Aissa
Hatty Barthorp	Anastasia Marshak
Sinead O'Mahony	Helen Young
Peter Ndungu	Anne Radday
Julie Tanaka	Bridget Fenn
Getinet Babu	Nicki Connell
Alexandra Rutishauser-Perera	Pilar Charle
Claudine Prudhon	Bernardette Cichon
Willie Ganda	Mathias Altmann
Sonja Read	Freddy Houngré
Jennifer Pietropaoli	Lieven Huybregts
Philip Moses	Stephanie Stern
Heather Forrester	Melchior de Roquemaurel
Abbi Sage	Charulatha Banerjee
Elizabeth Hohenberger	Ambarka Youssoufane
Dawit Mekonnen	Diane Holland
Florence Tapié de Céleyran	Mark Myatt

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Front cover

Taking blood sample during ENN-led study arm of REFANI research, Pakistan, 2016; Zubaida Metlo/REFANI, Pakistan

About ENN

ENN is a UK registered charity, international in reach, focused on supporting populations at high risk of malnutrition. ENN aims to enhance the effectiveness of nutrition policy and programming by improving knowledge, stimulating learning, building evidence, and providing support and encouragement to practitioners and decision-makers involved in nutrition and related interventions.

ENN is both a core team of experienced and academically able nutritionists and a wider network of nutrition practitioners, academics and decision-makers who share their knowledge and experience and use ENN's products to inform policies, guidance and programmes in the contexts where they work.

ENN implements activities according to three major workstreams:

Workstream 1: Experience sharing, knowledge management and learning. This includes ENN's core products: *Field Exchange*, Nutrition Exchange and en-net, as well as embedded knowledge management within two key global nutrition fora (the Scaling Up Nutrition Movement (SUN) and the Global Nutrition Cluster (GNC)).

Workstream 2: Information and evidence on under-researched nutrition issues. This comprises ENN's research and review work on filling gaps in the evidence base for improved nutrition policy and programming.

Workstream 3: Discussion, cooperation and agreement. This includes a range of activities for discussing and building agreement and consensus on key nutrition issues. It includes ENN's participation in and hosting of meetings, its activities as facilitator of the IFE Core Group and its participation in the development of training materials and guidance, including normative guidance.

ENN's activities are governed by a five year strategy (2016-2020), visit www.enonline.net

The Team



Jeremy Shoham and Marie McGrath are *Field Exchange* Co-Editors and Technical Directors.



Carmel Dolan and Emily Mates are Technical Directors.



Chloe Angood is a nutritionist working part-time with ENN on a number of projects.



Tui Swinnen is ENN's Global Knowledge Management Coordinator (SUN Movement).



Charulatha Banerjee is ENN's Regional Knowledge Management Specialist for Asia, based in India.



Ambarka Youssoufane is ENN's Regional Knowledge Management Specialist for West Africa, based in Senegal.



Peter Tévret is ENN's Senior Finance Manager, based in Oxford.



Clara Ramsay is the ENN's Finance Assistant, based in Oxford.



Judith Fitzgerald, is the Operations and Mailing Assistant at the ENN.



Orna O'Reilly designs and produces all of ENN's publications.



Phil Wilks (www.fruitysolutions.com) manages ENN's website.

Field Exchange supported by:



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ENN

32, Leopold Street, Oxford, OX4 1TW, UK

Tel: +44 (0)1 865 324996

Fax: +44 (0)1 865 597669

Email: office@enonline.net

www.enonline.net

