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### Dedication to Basra Hassan Farah

The ENN would like to dedicate this edition of Field Exchange to Basra Hassan Farah, a Nutrition Specialist with UNICEF who died in a restaurant attack on Friday 17th January 2014, in Kabul, Afghanistan. We also extend sympathies to the family and friends of Dr Nasreen Khan of Pakistan, a UNICEF Health Specialist, who died in the attack, and to the families and friends of the remaining 19 people who were killed. For the past four years, Basra was the Nutrition Cluster Coordinator in Afghanistan. Basra’s death prompted an outpouring of messages in the international community that have been collated by Josephine Ippe, Global Nutrition Cluster Coordinator, who was a longstanding friend and colleague of Basra. While the ENN team crossed paths with Basra just a handful of times, we have such fond and strong memories of her that are testament to her bright and engaging presence and strength of character; a true humanitarian.
There is no single theme for this issue of Field Exchange but lots of interesting and wide-ranging material. A good place to start this editorial is to note the short research piece on the World Bank/UNICEF/WHO joint database on child malnutrition, which has just been updated to include statistics on wasting. The latest report provides the current context in which we all work. In 2012, amongst children under five years globally, 162 million were stunted, 99 million underweight, 51 million wasted, 17 million severely wasted and 44 million overweight. Between 2000 and 2012, the prevalence of stunting, underweight, wasting and severe wasting fell while overweight increased. There is a higher proportion of stunting, underweight, wasting or severe wasting in children under five years in Asia.

Field articles in this issue cover a range of programming areas. An article by Cyrus Shahpar and Leisel Talley at CDC describes an impact study on a Blanket Supplementary Feeding Programme (BSFP) in northern Kenya. BSFPs are increasingly becoming standard practice to address seasonal peaks in wasting in high burden vulnerable countries. However, the evidence base for these programmes and their effectiveness is still weak. The Kenya study involved a prospective evaluation of a BSFP in Turkana and Wajir and was conducted using a longitudinal cohort of non-malnourished children between 6-36 months of age in a group where nutritional status improved, however, a subset of children became malnourished whilst in the programme. Children who had a lower height for weight z score (WHZ) or mid-upper arm circumference (MUAC) or lower dietary diversity upon enrolment were more likely to develop acute malnutrition. BSFP monthly rations were consumed in less than 14 days for more than half of beneficiaries. These findings echo those of a similar study conducted by ENN in Chad that will feature in a future edition of Field Exchange.

On a different note, a field article written by Save the Children Somalia examines the multi-sectoral impact of cash programming. Multi-sector integrated programming has become a bit of a holy grail in the nutrition world and is seen as desirable - if not essential - by many, as nutritional problems are invariably multi-causal. However, multi-sectoral programming is easier said than done for a variety of institutional, funding and professional reasons. This article describes how cash programming enabled beneficiary led multi-sectoral integration involving education, food security and livelihoods impact. These findings have particular resonance given the phenomenal scale of cash programming in the current Syria regional response and the move from cash for food or shelter towards more multi-sectoral objectives.

It is a nice change to feature a contribution from a team of veterinary doctors working with Vétérinaires Sans Frontières Germany in this edition. They describe a goat supplementary feeding and voucher based community animal healthcare programme implemented amongst pastoralists in two drought affected districts of Ethiopia. One of the aims of the programme was to improve child access to animal milk, which they achieved. Child nutrition impact assessment was limited to focus group discussions where benefits were reported. How to strengthen the nutrition impact assessment of nutrition-sensitive programmes is a key question emerging from this article and is the focus of a research piece by ACF mentioned further below.

An article by Concern Worldwide describes a model to provide surge support for community based management of acute malnutrition (CMAM), to meet peaks in demand for nutrition services provided through government health systems in Marsabit County, Kenya. It involves risk analysis, threshold setting, monitoring against thresholds, provision of surge support and scaling down of surge support at health centre level. Small scale surge support has been triggered 11 times by health workers at pilot health facilities between January and September 2013. Surge support included provision of extra staff, relocation of supplies, and more supportive training and supervision.

Another field article to mention, written by Ruco Van Der Merwe at Samaritan’s Purse International Relief, describes a milling voucher scheme for a food aid dependent refugee population in south Sudan. The scheme aimed to reduce ration exchange for milling services and therefore increase the length of time that household rations lasted. Local markets and milling services successfully adjusted to the increase in programme demands. However, an unanticipated consequence was a fall in miller profits due to over-supply of millers.

Special mention must be made to one field article that sparked a lot of discussion before it even graced the pages of Field Exchange, on the topic of infant and young child feeding (IYCF) assessment in small sample surveys. Written by a collective of agency country staff coordinated by Mark Myatt, the work grew from an increasing demand to assess community IYCF practice to inform programming design and monitor impact. Measurement of WHO IYCF standard indicators was limited due to the sample sizes needed. The authors describe an approach piloted in Sierra Leone, Niger and Sudan that involves a composite IYCF indicator to classify IYCF practice as ‘good’ or ‘not good’ amongst 0-23 month old children. Sample sizes were small, less than 210 children. The approach has its limitations duly acknowledged by the authors. Some important technical limitations and concerns are identified in a postscript to the article by UNICEF and WHO to which the authors again respond. The UN comment does reflect some short-comings in the accessibility of technical guidance and shared experience both with and within country programmes – for example, relevant experiences in IYCF indicator rollout in UNICEF are highlighted in the postscript but appear not to have been accessible to the UNICEF staff who co-authored this article. Meanwhile, problems with the WHO IYCF indicators at programming level seem to be partly because they are perceived as complicated, rather than this actually being the case. The ‘collective action’ called upon in postscript is heartening and we hope encourages individual agency responsibility and practical action to support the field more in their work, e.g. the development of user friendly guides on existing IYCF indicators by WHO. This article has sparked a constructive dialogue long overdue and is another reminder of how much innovation in our sector comes from those working “on the ground”. All involved are keen that this exchange proves the start of a technical conversation in some shape or form to fill this gap. Where feasible, the ENN will continue to feature such innovations and facilitate constructive dialogue around contentious technical areas, linking policy makers and programmers.

The research summaries in this issue cover a multiplicity of subjects. Many of these address important operational questions and challenges. However, there are also a couple of articles which shine a slightly less favourable light on the ability of our sector to learn lessons and move forward. We start with the positives.

With nutrition sensitive programming becoming something of a buzz phrase at the moment, we are pleased to be able to summarise an important study on how to make agricultural programming more nutrition sensitive. Based on three country case studies in Burkina Faso, Kenya and Peru the study tries to answer a number of key questions: How do national agricultural policies integrate nutritional issues?

1 See the GNC tribute to Basra at http://www.unicef.org/nutritioncluster/files/GNC_Tribute_to_Basra.pdf
2 See a briefing note regarding the ENN research in Chad at http://www.ennonline.net/post/files/research/briefingon2013final.pdf

From the Editor
What are the main constraints to agricultural policies improving efforts to end under-nutrition? How best could these constraints be alleviated?

On a completely different topic, this edition features a study by MSF which looks at what happens to low WHZ kids not admitted to a feeding programme in Bangladesh where only MUAC is used as a criterion of admission for treatment. Low WHZ children were not admitted but monitored in the community. Findings are interesting on a number of levels as only 6% of uncomplicated low WHZ kids deteriorated, while there were very high levels of ‘spontaneous recovery’ (58%), amongst these children. This particular finding also resonates with the UNN Chad study on a BSFP referenced earlier, where the rate of spontaneous recovery (recovery without targeted intervention) was even higher - approximately 80%.

Another topical study we summarise is work in India by Singh et al which examines the feeding, clinical profile and management strategies for severely malnourished infants under 6 months in an inpatient nutrition rehabilitation centre. They find good outcomes although non-responders are high (approx. 27%), largely due to default. This complements nicely two additional articles on the topic of malnutrition in infants under 6 months. Firstly, a small qualitative study in Malawi investigated expectations of treatment for this age group amongst mothers and families. Interestingly, inpatient treatment was a preferred option based on high expectations (rather than experience) of care. A strong informal community network was identified that could help shape future community-based interventions. The second article by Martha Mwangowwe and Jay Berkeley summarises common challenges in measuring infants under 6 months amongst experienced health workers in Kenya. Strategies to overcome these are identified, revolving around building trust to manage caregivers’ anxiety, and greater attention to detail in measurement.

There is also an interesting and potentially important study comparing outcomes of Lot Quality Assurance Sampling (LQAS) surveys with 30 by 30 cluster surveys. While LQAS confidence intervals were wider, only findings for one indicator were statistically different to findings from the cluster survey, yet LQAS was obviously and significantly a lot cheaper.

The several studies cited above point to knowledge acquisition and progress in our sector. However, two other studies summarised in this issue engender a little less optimism. One study reviews the factors that led to the Somalia famine in 2011 which led to an estimated 275,000 deaths – mainly amongst children. Strategies to overcome these are identified, revolving around building trust to manage caregivers’ anxiety, and greater attention to detail in measurement.

Meeting demand peaks for CMAM in government health services in Kenya

By Regine Kopplow, Yacob Yishak, Gabrielle Appleford and Wendy Erasmus

Regine Kopplow is a Global Nutrition Advisor with Concern Worldwide. She previously worked in various roles in nutrition programmes in Afghanistan, Malawi and Nepal for Concern Worldwide and in Somalia, South Central Somalia for UNICEF.

Yacob Yishak is the Health and Nutrition Programme Director of Concern Worldwide Kenya. He is responsible for the overall coordination of technical and managerial functions of the programme. He has worked with Concern for the last five years in nutrition programming, assessment and research and conducted a number of national and regional trainings in nutrition and mortality assessment. He is a Master trainer in SMART methodology.

Gabrielle Appleford is a freelance consultant working with Concern Worldwide Kenya on knowledge management. She has a technical background in public health and has worked with various organisations on health and nutrition programming in the East Africa region and more widely. She is based in Nairobi, Kenya.

Wendy Erasmus is Concern’s Country Director in Kenya. She is a specialist in mother and child health in developing contexts. Her career in international emergency and development work spans more than twenty years, six of which have been with Concern. She has worked in South Sudan, Rwanda, Burundi, DRC, Somalia and Kenya amongst many others.

Concern Worldwide would like to thank ECHO for their support for the CMAM surge model.

Editorial

The humanitarian community and national governments increasingly recognise that early warning and response are more effective and less costly than late response. In practice, the relationship between warning and response often remains tenuous. Early warning in the 2010/2011 food crisis in the Horn of Africa did not lead to early action and resulted in loss of livelihoods and lives. Concern Worldwide (Concern), who were part of the humanitarian response in the arid and semi-arid lands (ASALs) of northern Kenya, used learning from the delayed response to develop a model of support for community-based management of acute malnutrition (CMAM). This article describes the CMAM ‘surge model’ and its application in Marsabit County by Concern and the Government of Kenya (Gok). The model builds upon Concern’s experience implementing CMAM in emergency and development contexts, and is informed by the organisation’s experience in health system strengthening through its child survival interventions.

Background on CMAM

CMAM was adopted as international best practice by the United Nations in 2007 and is being implemented in 60 countries worldwide including Kenya. Although spikes in

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2 The Ministry of Health domesticated the CMAM approach for Kenya. This is referred to as the ‘Integrate Management of Acute Malnutrition’ or IMAM.
3 Concern currently supports CMAM programmes in Chad, Ethiopia, Haiti, Kenya, Malawi, Niger, Rwanda, Sudan, South Sudan and Uganda.
4 Concern has successfully implemented Child Survival programmes in six countries to date: Bangladesh, Rwanda, Burundi, Haiti, Niger and Sierra Leone. In 2012, Concern initiated a Child Survival Programme in Kenya.
In response to lessons and the rallying call for a new design framework for CMAM programming, one that employs capacity-based response thresholds that trigger support based on existing health system capacity; this is reflected in Figure 1.

Over time, through such an approach, it can be expected that health system capacity to manage spikes in cases of acute malnutrition would improve; this would be reflected in revised upwards capacity thresholds and allow for increased attention to other aspects of service delivery, coverage and quality. The model presumes that there is some existing health system capacity and local commitment (of managers and health workers) to HSS. Without base capacity and commitment, the health system could potentially be in permanent ‘surge’ mode, leading to direct service provision by an external agency with no exit strategy in place. Box 1 reinforces the underlying requirements of the model.

**Surge components**

The surge model contains a series of components, which align with and reinforce the WHO’s health system building blocks. These are outlined in Table 1. The capacity of a health system to cope with increased needs for curative care for any disease or condition is a key aspect of HSS. It is also a means of promoting preparedness under a broader DRR framework, especially in areas where populations live in a chronic state of food and nutrition insecurity.

### Contextualising the CMAM Surge Model

In 2010 and 2011, the Horn of Africa had two consecutive seasons with below-average rainfall, resulting in one of the worst droughts in 60 years. This put 12 million people in Kenya, Somalia and Ethiopia in urgent need of humanitarian assistance. In Kenya, this mainly affected the ASALs. In the ASALs, the effects of drought related food insecurity are manifested in high maternal and child malnutrition. Underlying factors which contribute to high levels of malnutrition in these areas include pre-existing chronic and acute food insecurity; poor dietary diversity; poor child care and feeding practices; poor hygiene and sanitation; limited infrastructure, poor health service delivery and market integration; as well as sporadic conflict. Concern was part of the humanitarian response in Marsabit County and was the lead non-governmental partner for health and nutrition in Moyale, Chalbi and Sololo districts.

In most of the affected districts of the county, the emergency response was initiated after the GAM rates were above 20%.

Described, the response was successful in addressing malnutrition through static and outreach provision of health and nutrition services. Post analysis of the response by Concern and District Health Management Teams (DHMTs) revealed that there was a lack of pre-emergency planning (despite slow onset of the emergency and early warning), limited use of available data and contextual analysis and limited understanding of how and when to scale up interventions. Conclusions drawn at the time indicated the need to establish:

- Emergency thresholds as part of disaster risk reduction (DRR) to enable the DHMTs to initiate early response to predictable emergencies.
- Community-based surveillance for early detection of malnutrition (number of cases and trends).
- Indicators and thresholds to facilitate planning and prompt scaling up and down of service provision.

In response to lessons and the rallying call for a new design framework for CMAM programming, Concern and the DHMTs developed the ‘CMAM surge model’.

**The CMAM Surge Model**

**Model principles**

The CMAM surge model is premised on one of the fundamental principles of CMAM, that early detection of malnutrition leads to improved treatment outcomes and fewer cases of SAM, as children are treated before their malnutrition becomes severe. The model affirms that strengthening the capacity of the health system to manage better spikes in demand for services is essential to ensuring quality health services and health systems in the longer term. The model aims to:

- Strengthen the capacity of government health systems to effectively manage increased caseloads of malnutrition during predictable emergencies without undermining the health system, the provision of other services and on-going systems strengthening efforts.

The CMAM surge model prepares the health system to plan for, detect and respond efficiently to spikes in GAM and SAM prevalence and caseload; while it does not prevent malnutrition, it does trigger early action and community mobilisation. It responds to the call for a new design framework for CMAM programming, one that employs capacity-based response thresholds that trigger support based on existing health system capacity; this is reflected in Figure 1.
Surge components

Figure 2 provides a visual representation of the components of the surge model. The figure has been presented as a cycle given the chronic nature of food and nutrition insecurity in the ASALs, due to both seasonal peaks and drought-related ‘nutrition’ emergencies. Steps in the cycle are as follows:

1. Risk analysis: Facilities implementing the surge model analyse the drivers of increased caseloads of acute malnutrition in their contexts. The intention is to facilitate an understanding of what is considered a ‘normal’ caseload and why, when, and to what degree, spikes occur. Both supply and demand-side factors are considered as part of this. These range from seasonal impediments to health seeking behaviour, such as women’s workloads or festivals, to health ‘systems’ issues, such as absent health workers or a lack of commodities. All factors are triangulated to estimate the expected caseload over the year under different conditions and should be reflected in the caseload seen at the facility. Trends may be quite localised, therefore analysis should be conducted with the staff and key community informants at each facility.

2. Threshold setting: Thresholds are developed to indicate a critical number of monthly cases at a health facility, above which the type and scale of support changes. These thresholds are defined by the staff at each health facility and should be based on their capacity to respond to increasing health and nutrition needs. Caseload records (SAM, MAM, malaria, pneumonia, diarrhoea, etc.) of the previous months can help in defining realistic thresholds, as well as drawing from staff experiences during times when service needs exceeded available resources or capacity.

3. Monitor against thresholds: Caseloads are monitored and compared against thresholds on a monthly basis. This is done using hand drawn wall charts. Once a threshold is exceeded, the health facility informs the DHMT, mobilises its own resources, and, if needed, requests additional support, based on a pre-defined and jointly agreed package. This support should enable the facility to cope with an increasing number of patients without compromising the quality of health services.

4. Provision of surge support: The type and level of surge support, and how and when it is scaled up and down, is formally agreed at district level prior to implementation of the model. Surge support is only meant to come in once local resources are mobilised and efficiently used, to fill in the additional gap due to a deteriorating situation. This will allow routine health services to continue without compromising the quality or type of services. Figure 3 outlines the flow of support within the model.

5. Scaling-down surge support: Once the caseload are reducing, support is gradually scaled down until it reaches the pre-surge level. Figure 4 provides a visual representation of the scaling up and down mechanism. Support is triggered by the health worker who is closest to the clients and community.

Application of the CMAM Surge Model

The CMAM surge model is being piloted with DHMTs and health workers in the three districts of Marsabit County – Moyale, Chalbi and Sololo. Activities commenced in May 2012 and continue to date, and are being implemented in 14 health facilities across the three districts. Implementation of the model is part of a larger ECHO funded project. Initiation of the model involved pre-defining the surge support package and agreeing on roles and responsibilities, through formal agreement, between Concern and the respective DHMTs. While these aspects of the model are not featured in Figure 2, the parameters of external support need to be set at the initial stage of implementation and require only periodic review.

Risk analysis: Health facility personnel and DHMT members were supported to identify factors contributing to caseloads of malnutrition seen in the 14 facilities (note, this does not necessarily correlate with caseload in the community). In the context of Marsabit, the following factors were identified: rainfall, conflict, population movement, workload of households and festivals. Stakeholders then developed graphs of recorded caseloads for children with diarrhoea, pneumonia and severe and moderate acute malnutrition, and were trained to interpret contextual factors and relate these to observed number of cases. Through this process, health workers could then better understand which factors increase prevalence of acute malnutrition and which deter health seeking behaviour; from this understanding, spikes in caseload could be predicted.

Health workers also developed an appreciation of the importance of coverage of services and the need to investigate deviations in anticipated caseload. For example, seasonal peaks are expected in July at the onset of the rains when several factors overlap: 1) the number of diarrhoea cases increases, 2) the workload, particularly for women, increases due to agricultural activities, and 3) most households run out of food stocks. Health workers appreciated the need to investigate with the community reasons for any deviations from anticipated caseload during this period. For Marsabit stakeholders, the risk analysis was considered a real ‘eye opener’. It gave them better predictive skills over future events and an understanding of causal factors. The process was so enlightening that the DHMT in Sololo conducted a similar exercise for all health facilities in the district.

Threshold setting: Health personnel were then supported to define capacity thresholds based on their analysis of their own ability to respond to an increase in health and nutrition needs. Caseload records for MAM, SAM, diarrhoea and pneumonia from the previous months assisted in defining realistic thresholds, as well as drawing from past experience. Capacity has multiple factors – the total number of human resources for health, individual qualifications as well as motivations, equipment, supplies, community support, etc. As a result, threshold levels need to be defined by facility. These were then mapped against four phases — normal, alert, serious and emergency. In the case of Marsabit, thresholds were set for both MAM and SAM.

Monitor against the threshold: Monitoring is done on a monthly basis using prepared wall charts to plot caseloads for diarrhoea, pneumonia, MAM and SAM. Data are extrapolated from facility reports, the “source” documents for the Health Management Information System. This exercise does not take long given that the data are already compiled. The thresholds are placed beside the graph and immediately used to compare the recorded cases. In the case of Marsabit, the health facility staff have found the monitoring of caseloads against the thresholds valuable, since it is the only exercise which does not take much time but generates crucial insight. The health staff appreciate that they...
are in the ‘driving seat’ and that they decide when to request additional support. While the response trigger is SAM and MAM in Marsabit, any disease or condition could be used. Figure 5 presents one facility’s event calendar and monitoring data.

The process of regular plotting of admission data against the threshold enables health workers to track even slight changes in their context over time. It allows for gradual intensification of support as and when this is required based on a pre-agreed package. The model therefore promotes data for decision making at facility level and system efficiencies, as external resources serve gap filling requirements for discrete periods of time only. An additional component of the model, one that does not take place at facility level, is community engagement. How effective this component is has significant implications for facility-based thresholds, the accuracy of trend analyses and supply-and-demand-side factors related to service utilisation. Concern is currently testing a community-based surveillance system in order to ensure that trends at health facility level are reflective of the situation in the community. The surveillance system operates through Ministry of Health defined community units – Community Health Committees, Community Health Extension Workers (CHEWs) and Community Health Workers (CHWs).

Proof of concept: Conditions in Marsabit County have recovered since the 2011 drought mitigating the need for ‘surge’ support at scale. However, the model has been ‘triggered’ 11 times by health workers at pilot health facilities between January and September 2013; in one instance, this reached the emergency threshold level. Box 2 provides details on this event.

**Box 2: Exceeding the emergency threshold in Debél health centre**

Debél health centre is situated in Moyale district and serves a population of approximately 7,500, including 1,400 under five children and 1,800 women of reproductive age. The facility is staffed by one nurse supported by two CHEWs. In May 2013, MAM cases exceeded the emergency threshold set at 30 new admissions (actual cases = 35). This triggered surge support from the DHMT and Concern. Support included the transfer of a CHEW and secondment of a nurse from the district hospital; the provision of weekly on-the-job training and supportive supervision by the DHMT and Concern, the reallocation of supplies and equipment from another health facility as these were insufficient; and community mobilisation and outreach clinics to the more distant communities. Analysis of the factors contributing to the increased caseload included the following:

- Increased diarrhoea in May 2013
- No general food distribution since March 2013. In addition, the last distribution included maize not rice. Maize is often sold for other commodities as area with inadequate milk which comprises a big part of the children’s diet in the area.
- The nursery was on leave in April 2013 so few admissions were done for that month.

Surge support was gradually reduced and ceased altogether once the case load returned to normal. The response had the additional benefit of securing a CHEW for the facility on a permanent basis and the repair of broken equipment (a mother and child scale).

**Funding modality**

The preparation or set up of the surge model was covered by routine funding secured to support MOH in providing CMAM and general HINI services. Concern’s CMAM support to MOH was mainly funded by UNICEF, while ECHO funded the model development. The setup was low cost, involving a centralised workshop of 1-2 days to introduce the model to MOH at county and district level. In this programme example, the facility level model setup involved two on-the-job training/supportive supervision visits at each health facility. The first visit covered the risk analysis and the second one the setting of thresholds. The model progress was monitored during routine supervision/on the job visits under the CMAM support to MOH, therefore no extra costs were involved.

In preparedness for a large scale up, Concern has estimated what it would cost to scale up each single surge element for one facility for one month and assumed that a specific percentage of months and facilities would require this support in a normal year. To enable large scale up/surge, flexible funding models for integrated CMAM services are required. Donors are showing interest in providing stand-by funds as long as the modalities for their mobilisation is clear and agreed in advance (which this model provides).

**Lessons learned**

The model will be evaluated in 2014 as part of its ‘proof of concept’ so that it may be scaled up or replicated in other ASAL counties. Lessons learned to date include the following:

- Acceptance of the model is closely related to its simplicity
- Incorporating community systems into the

**Conclusion**

Health systems are intended to be flexible systems, able to expand and contract as need requires. Making health systems ‘disaster proof’ should be an aim of all HSS initiatives and is a true reflection of an able system. Given the predictable nature of humanitarian ‘nutrition’ emergencies and seasonal spikes in malnutrition in the Kenyan ASALs, localised capacity is essential. This will require external agencies, such as Concern, to work differently. Government health managers, for their part, will also need to work differently; their pro-active and effective leadership remains crucial both during and after emergencies. The CMAM surge model serves as an effective approach for realigning government and non-governmental roles, those of external agencies and health system ‘stewards’ and operators, for more effective and cost effective provision of CMAM, allowing services to reach more people, at the right time and in the right quantity.

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13 Community engagement can also influence supply-side factors of health care provision such as staff attitudes, their availability, etc.

14 HINI is a package of interventions proven to reduce mortality rates. It includes management of acute malnutrition, vitamin and mineral supplementation, immunisation, de-worming, promotion of appropriate child feeding and hygiene practices, and nutrition education.
Building resilience: nutrition and beyond
By Gabrielle Appleford and Wendy Erasmus

For Concern, building resilience requires systems thinking and adaptive capacity. Experience from implementing the CMAM surge model, described in the previous article, reinforces the importance of both. Making health systems ‘disaster proof’ should be an aim of all system strengthening initiatives and is a true reflection of an able system. This principle applies to non-health systems as well. Concern is currently working on adapting and testing the surge model concept for animal health, social protection, and water resource management systems. Taking the case of animal health as an example, the same surge model components (outlined in Figure 1 of the field article) apply to animal health. An analysis of risk would need to be undertaken to assess the factors that contribute to deterioration of animal health, being sure that there is a clear link between the animal health deterioration and its impact on human health and markets. Once risk factors are identified, thresholds would be set, which, when exceeded, would trigger an appropriate level of response and a standardised, pre agreed package of support. A system of monitoring the situation against the agreed thresholds would need to be developed. In Kenya, this system could be established through the community based disease surveillance approach. Work would need to be done with the County Veterinary Department to design and cost a package of support for each level aimed at averting impact on human health. And lastly, agreement on the scale down of support would need to be negotiated and factored into the model. The same model components and process of model development would be applied to social protection and water resource management, always ensuring adherence to the main four principles of the model: systems strengthening, predictability, demand and context driven, and accessibility.

Working differently requires external agencies, such as Concern, to respect the centrality of government stewards and systems; their role as duty bearers is non-transferable, even in times of crisis. Ways of working that reinforce this mandate need to be strictly practiced. Supporting the process of recognising and claiming rights, as well as holding duty bearers to account, is a role that external agencies can facilitate and should be considered part of a risk management approach. Respecting systems and processes and the centrality of their stewards and operators, also means that performance metrics need to move beyond therapeutic results so that technical quick wins do not undermine, but rather strengthen, systems in the long run. In the case of Kenya, this means that health and nutrition organisations should be measured on how high impact nutrition interventions (HIIN) are achieved and not just on targets reached.

In order for external agencies, such as Concern, to remain relevant – resilient if you will – their technical and operational arsenal needs to expand to incorporate more measures that facilitate adaptive capacity and systems strengthening. The CMAM surge model is an example of such an approach. Being part of the changing conversation, facilitate, through vehicles such as the Food Security and Nutrition Working Group (FSNWG), allows agencies the opportunity to debate, collaborate and innovate so that their interventions remain relevant to the communities and governments with whom they work. A changing context and the changing nature of risk dictate this. It is hoped that this will mean that more agencies are doing the right thing, at the right time, and reaching the right people through the right systems so that the cycle of late response to humanitarian disaster is reversed in the Horn of Africa.

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Postscript

Impact of milling vouchers on household food security in South Sudan
By Ruco Van Der Merwe

Yida refugee camp is located in Pariang County, Unity State, South Sudan. The population primarily comprised of agro-pastoral Nubans – started fleeing to the location in 2011 when fighting resumed in the neighbouring South Kordofan State between the Sudanese Armed Forces (SAF) and the Sudanese People’s Liberation Movement-North (SPLM-N). The initial year and a half of the camp’s existence saw the population rapidly rise to over 65,000; these have largely stabilised since March 2013. Thousands of people arrived to Yida camp with few household assets and in poor general health. Samaritan’s Purse (SP) was the first agency on the ground and rapidly mobilised an emergency response. As the camp population grew, SP partnered with WFP and UNHCR to provide emergency food assistance and nutritional support to the refugees, as well as expanding into water, sanitation and hygiene (WASH) and protection activities.

Mid-2012 saw fluctuations in global acute malnutrition (GAM) rates, which led to several assessments seeking to establish the root causes of continued food insecurity, despite the provision of 100% general food distribution (GFD) rations (SPHERE standard), 100% food assistance coverage of the population in need, and a full array of nutritional services. Investigation found that households were significantly reducing their total caloric intake due to costs associated with...
Location: South Sudan

What we know: Exchange of general food distribution commodities for non-food items or services is common in food assistance and may contribute to food insecurity.

What this article adds: A milling voucher scheme in a food assistance dependent refugee population reduced ration exchange for milling services and increased how long household rations lasted. Local markets and milling services successfully adjusted to the increase in programme demands. An unanticipated consequence was a fall in miller profits due to over-supply of millers. A routine monitoring tool that evaluates programme impact at the miller level and responds to this is recommended.

Methodology
Two weeks were spent in South Sudan meeting with relevant actors, field staff, and beneficiaries. Secondary data covering 12 months were analysed, which allowed for comparison of indicators before and after the voucher programme commenced. The case study used both primary and secondary data from the following six sources:

1. A Rapid Miller Survey: Fifteen out of the 59 certified millers were interviewed. Yida camp is currently divided into 20 blocks; 1 miller each was selected from each of 15 blocks.
2. Market Price Monitoring: SP routinely tracks key commodity and service prices in Yida market. For this specific study, diesel and petrol prices were analysed.
3. Post-Distribution Monitoring (PDM) data: As part of the GFDR, SP routinely carries out PDMs two weeks following the food distributions. Data were collected and analysed from January to September 2013.
4. Nutrition data: This study examined routine admission data from an SP supported supplementary feeding programme (TSFP) in Yida camp.
5. Food-security and nutrition assessments: Analysis of data that had been collected since the establishment of Yida camp (ACF’s Integrated Nutrition and Retrospective Mortality Survey; Samaritan’s Purse and Liverpool Associates in Tropical Health’s Yida Joint Household Assessment; QAS Survey of Key Household Indicators Related to Current Malnutrition Trends; and Yida Interagency Milling Assessment).
6. Focus Group Discussions (FGD): Five FGDs were carried out on October 17th in Yida camp with groups disaggregated as follows: three groups of women, one group of youth, and one group of community leaders. Each group had 8-10 representatives.

Limitations
The data presented in this article should be reviewed keeping in mind several limitations and factors influencing the results.

- Seasonality plays a significant role in Yida camp where the rainy season has traditionally impacted access and mobility. Population mobility is generally limited during the rainy-season months (June–September) meaning that most new arrivals show up during the dry season (October–May). Road access has recently improved following improvements to the Yida-Bentiu route, which has resulted in better availability of goods on the local market and stabilisation of prices. Household-level food production is not currently encouraged in Yida due to its proximity to the border and security concerns.
- Data presented from the PDM and rapid miller assessment is not statistically representative of the entire population and is only intended to give general insights.
- Nutrition is influenced by a host of complex factors so that there may not be a direct causality between the voucher programme and subsequent nutritional outcomes.

Implementation
Targeting
A total of 59 millers were selected to be certified service providers for the camp. Beneficiaries were entitled to redeem their vouchers at any one of the participating certified-milling locations.

Voucher Value
Vouchers were restricted to milling services and entitled each person to mill 3 malwas of cereal (approximately 10.5 kg or 70% of a beneficiary’s rations). The average price of milling 1 malwa is approximately 3 SSP, meaning that the entire voucher value is equivalent to 9 SSP (3 USD) per person per month (Figure 1). Vouchers were distributed according to household size.

Partners
The implementation of the project was divided between five actors. WFP and UNCHR were jointly responsible for printing and providing the vouchers to SP and for monitoring market prices and analysing PDM data. SP was responsible for distributing the vouchers to the beneficiaries and carrying out PDM. Certified millers were responsible for receiving vouchers in exchange for milling services. Equity bank was responsible for paying all the millers in accordance to the number of vouchers they presented. Payments should occur on a bimonthly basis to ensure that millers have enough cash flow for continuous milling operation. In November 2013, SP took over miller payments from Equity Bank.

Process
1. Receiving Vouchers:
   - Every month, SP in partnership with the local WFP office, submitted a VRN (voucher-release note) to WFP Juba. The VRN is based on the anticipated beneficiary case-load for the upcoming month, as determined by UNHCR’s registration figures. WFP

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Figure 1: Voucher value

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Field Article

was responsible for delivering the vouchers to the field location before the distribution cycle begins. Upon delivery, vouchers are counted, verified, and signed over to SP.

2. Distributing Vouchers:
Voucher distribution was integrated into the existing GFD system to improve cost-efficiency and accountability. The distribution process in Yida used UNCHR’s innovative rapid food-distribution system, which integrates bar-code scanners during the distribution process. In order to receive their ration, beneficiaries had to present their ration card, which had a bar-coded strip on it. This strip was scanned upon entrance into the GFD area to pull up a photo of the individual for visual verification. Once a beneficiary was visually verified, the bar-coded vouchers were scanned and the vouchers were linked to that specific household. If it was a household size of four, then the software required four vouchers to be scanned (one per person); if household size was seven, then seven vouchers; etc. At the end of the GFD, distribution records were compared with voucher-inventory records for accountability.

3. Payment:
Once all of the distributions were completed, a final voucher distribution figure was presented to WFP, along with empty voucher books and any remaining vouchers. Equity bank was then notified of the final amount to be transferred and coordinated with WFP and the millers to arrange for an appropriate time to carry out the cash transfer.

4. Reporting and Monitoring:
Project output with regards to vouchers received, distributed and returned, was monitored in the same way that food-commodity stocks were tracked and inventoried. Voucher impact at the household level was also monitored. This was accomplished via monthly post-voucher-distribution monitoring. Monitoring typically occurred two weeks after distribution.

Market conditions
The area surrounding Yida camp is extremely prone to flooding during the rainy season, which led to significant access constraints. The 2011-2012 rainy seasons saw camp access reduced almost exclusively to air support. Significant road work was done, which has since allowed for semi-reliable access to the nearest regional town and market of Bentiu, approximately three hours away by road in the rainy season. The camp itself has one primary market and three secondary markets that function on a daily basis. There are generally a wide variety of goods including primary commodities (cereals, pulses, and oil), livestock (cows, goats, and sheep), and fuel (diesel and petrol), although seasonal fluctuations do exist. The markets primarily serve the refugee population, although there is a very small host community that also access them. Most goods that reach Yida are sourced from Bentiu. There are no banks or money-transfer services available in the camp. Cell phone network provision by Zain has significantly improved, although no mobile money-transfer system exists in South Sudan. The map in Figure 2 gives a general idea of community assets, including grinding mill locations, in the camp.

Impact
Millers
One of the primary concerns facing the voucher programme was whether there would be market impact as a result of accessibility during the rainy season. In order for the project to function effectively, millers would require access to key inputs, such as diesel, petrol, machine parts, and maintenance services. If markets were not well integrated, or were inaccessible due to the rain, market disruptions would be likely. Millers were asked based on previous experiences, what were the major factors contributing to price fluctuations for their milling services. Both direct inputs of fuel and maintenance were stated to be the primary contributing factors; only 27% of millers felt that overall prices were indirectly affected by access (see Figure 3).

Using routine data collected from market price monitoring at Yida’s primary market, the survey was able to evaluate the impact that the voucher programme had on petrol and diesel prices. Figure 4 displays the commodity-price trends over time, where the red dots indicate the month in which the voucher programme commenced. There was inflation for both commodities (increase of 66% for petrol and 35% for diesel) between the months of May and July. This was likely due to initial increase in demand related to the programme beneficiaries, but also additional demand in relation to prepositioning for the rainy season. After July, markets stabilised and adjusted to the new levels of demand.

An interesting finding from the study was that major improvements in access to Yida (compared to previous years) resulted in a stable market environment. Most millers noted that they could source fuel directly from Yida market (93%) without having to seek out regional markets (7%). Also, 77% of all millers could access maintenance for their equipment from within the camp, either by servicing the equipment themselves (12%) or finding someone locally to do it (65%).

Millers further noted that access was not limited to the dry season only; 100% reported being able to access fuel at least occasionally during the rainy season. Most of the millers (93%) prepositioned fuel stocks in anticipation for the rainy season. The improved accessibility addressed a lot of the initial concerns regarding an increase in milling service demand within an insulated market.

The initial assumption was that the increase in demand for milling service would have an overwhelmingly positive impact on the millers. In reality, the miller survey showed that 60% of millers believed that business actually got worse. Millers reported an average decrease in profits of 41%, or 62% of SP (see Figure 5), and an average reduction of two hours of operation per day (from 10 hours to 8 hours daily). There is the potential for

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4 This term describes where a vendor prices commodities at a level much higher than is considered reasonable or fair. This often happens after a demand or supply shock and tends to be relatively short term and affect essentials.
Some recall bias, as the question regarding average weekly profits was conducted after the programme was already operational. The assessment itself did not examine the reasons behind the decrease in business, however discussions with project staff suggested that this was primarily due to an increase of milling-service providers during the project start up, as well as pre-voucher price-gouging that inflated profits. This would explain the decrease in profits as business was spread out across an over-supply of milling-service providers and prices for milling services became fixed.

All of the millers surveyed felt that the current payment system was not functioning well and asserted that this was due to delayed payment. Several millers reported running out of prepositioned fuel stocks resulting in a temporary closure of business until they were paid and able to restock. Additionally, millers noted a lack of adequate information being communicated by the partners in regard to schedule of payment or reasons for delays. It appears that there was little differentiation between the roles of SP, WFP, UNHCR, and Equity Bank; the perception of poorly managed payment schedule negatively affected all partners. All of the millers stated that they preferred the current system of vouchers for cash as the transfer modality, over banks or alternative systems. Overall, the millers were unwilling to consider alternative cash-transfer modalities, although this was probably influenced by the unreliability of the existing transfer process.

**Households**

Data for the evaluation of voucher impact on household food security primarily came from FGDs, PDMs, and nutritional data. All FGDs noted that the voucher programme resulted in their food rations lasting longer. Groups noted that rations are lasting between 4-7 days longer every month, since they no longer had to sell or exchange rations for milling services. One FGD noted it has improved feeding for young children, since they can now easily serve them porridge. The PDM data corroborates information from the FGDs (Figure 6). Cereals were reported to last on average four days longer (24 rather than 20 days) following the start of the voucher programme.

Prior to the voucher programme, households were exchanging approximately 27% (average across FGDs) or 8.1 days of rations for milling services. Since the voucher programme started, that figure had dropped to 2% (average across FGDs). One FGD noted that 10% of beneficiaries sell or exchange their vouchers when they desire access to alternative goods or foods (such as meat and onions). The “youth” FGD added that vouchers could be exchanged for food with millers at a rate of one malwa of ground sorghum for one voucher.

Nutritional data from the SP TSFP programme was collected and analysed to see whether any patterns arose in connection with the start of the voucher programme. Average TSFP new admissions (Sept 2012-Oct 2013) declined by 165 per month following the start of the voucher programme although attribution cannot be assumed (see Figure 7).

**Recommendations**

Pre-voucher market assessments should carefully consider whether supply meets programming demands, but also ensure that the project does not encourage the oversupply of services. The Yida case highlighted that a rapid and unchecked increase on supply side can actually have a net-negative impact on profits for service providers.

Millers voiced the need for routine information on the status of payments and project updates. This would be an easy component to integrate into all future voucher programmes and will likely result in higher confidence in the partnership.

Apply “do-no-harm” principles to all actors involved in the project cycle. Ensure payments are done on time, and include a penalty in contractual agreement for delayed payments. The Yida case exposed the fact that some millers were suffering business losses due to delayed payments and an inability to find capital to restock milling inputs. NGOs and business partners should be held accountable to ensure that their performance does not negatively impact the markets and individuals they are intending to assist.

It would be beneficial to integrate a routine-monitoring tool that evaluates programme impact at the miller level and allows for process adjustments.

**Conclusion**

The findings from this assessment indicate that the voucher programme has improved household food access. Households are significantly less likely to exchange their ration for milling services and rations now stretch an extra 4-7 days per month. Despite initial concerns regarding market integration and access due to Yida’s remote location, the majority of millers indicated routine access to goods on local and regional markets. The markets have been able to adjust to the new levels of demands for programme inputs (fuel and maintenance services). Future milling programmes should carefully consider the millers as a key beneficiary group and ensure monitoring tools are in place to routinely evaluate project impact on their businesses.

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**Location:** Burkina Faso, Kenya and Peru

**What we know:** There is increasing international interest in linking agriculture with nutrition. At national level, countries are aligning agricultural policies with nutrition. Traditionally, the agriculture sector is evaluated on the basis of its contribution to income generation and economic growth; accountability for nutrition is weak.

**What this article adds:** In Burkina Faso, Kenya and Peru, there are constraints to putting into practice the commitments made at policy level on nutrition-sensitive agriculture. In agricultural programmes, nutrition is not prioritised, is poorly understood, is not integrated into monitoring systems, is poorly coordinated and lacks funding. There are examples of good practice to help overcome these constraints such as basic and on-the-job training initiatives, agricultural information systems that integrate nutrition indicators and screening, and the potential for nutrition results-based budgeting across sectors.

A recent report by Action Contre la Faim (ACF) focuses on the challenges of making food systems deliver better nutrition outcomes. It aims to assess to what extent the global agenda on nutrition and agriculture is actually translating into action at country level, based on three country case studies conducted in Burkina Faso, Kenya and Peru that answer the following questions:

- **How do national agricultural policies integrate nutritional issues?**
- **What are the main constraints to agricultural policies improving efforts to end undernutrition?**
- **How best could these constraints be alleviated?**

Linking agriculture with nutrition and improving the nutritional impact of agriculture programmes and interventions is the topic of a growing international agenda. However, agricultural development does not automatically result in improved nutrition at the household or community level. In fact, while agriculture provides food and income it also requires investments, physical workload, time, etc., which compete with other uses that might also impact (positively or negatively) on nutrition.

There are seven main pathways between agriculture and nutrition, which show that agriculture can have both positive impacts and potential negative impacts on nutrition, particularly with respect to women’s use of time and control of income (see Table 1). Agricultural policies should maximise positive impacts while mitigating negative impacts with appropriate measures.

Burkina Faso, Kenya and Peru have recently committed to improving the alignment of their agricultural policies on nutrition outcomes. There is a double challenge to be taken up at country level: integrating agriculture as a key sector in national, multi-sectoral, undernutrition reduction strategies while also mainstreaming nutritional concerns, objectives and actions into sectoral agricultural policies, to increase their sensitivity to nutrition. In the three studies, it was found that there is actually a lag between what is increasingly being promoted at the international level and the responses of actors in the field. Even in countries that have ambitious multi-sectoral strategies against undernutrition, the agriculture sector has not necessarily dedicated a high priority to nutrition. In particular, the research found that the main constraints to unleashing the potential of agriculture for nutrition are:

- **The limited priority given to nutrition within the agricultural sector.**
- **The difficulties in adequately integrating nutrition into monitoring and information systems to allow cross-sectoral analysis on nutrition.**
- **The poor inter-sectoral coordination around nutrition between agriculture and other sectors.**
- **The lack of implementation of nutrition-sensitive interventions in the agricultural sector.**
- **The inadequate level of funding for nutrition-sensitive agricultural interventions and programmes.**

The authors of the report assert that it is possible to mitigate these obstacles. The experiences from Burkina Faso, Kenya and Peru provide interesting illustrations of good practices that are able to fill these constraints. The identified good practices are:

- Setting up nutrition within the agriculture sector agenda, such as the CAADP nutrition-sensitive agriculture investment plans (Kenya and Burkina Faso)
- Integration of nutrition courses into the training of agriculturalists in national agriculture schools (Burkina Faso)
- Integrating nutrition indicators into agriculture

ACF (2013). Sowing the seeds of good nutrition. Making agricultural policies deliver better nutrition. Report can be downloaded at www.actioncontrelafaim.org/en/content/seeds-of-good-nutrition (English version) or www.actioncontrelafaim.org/fr/content/graines-bonne-nutrition (French version). Contact is ACF Advocacy Department – ACF France. Elise Rodriguez. eliserodriguez@actioncontrelafaim.org
• Integrating nutrition into cross-sectoral policy coordination mechanisms against poverty (Peru)
• Increasing donor support to multi-sectoral coordination mechanisms, such as food security and nutrition donor working groups (Burkina Faso)
• Reinforcing the nutrition mandate of Ministries of Agriculture and increasing support to nutrition-sensitive programmes (such as with the Department of Food and Promotion of Nutritional Quality in Burkina Faso and the Home Economics section in Kenya)
• Establishing results-based budget mechanisms that hold different sectors accountable for common goals (Peru).

The study authors looked at the role of a limited number of organisations and initiatives in relation to nutrition sensitive programming, including the European Commission, USAID, the UN Food and Agricultural Organisation (FAO), the International Fund for Agricultural Development (IFAD), the World Bank and the G8 supported New Alliance for Food Security and Nutrition. Most are members of Scaling Up Nutrition (SUN) movement and have recently committed to improving their work on nutrition-sensitive agriculture at the G8 2013 Nutrition for Growth event. However, despite undeniable progress and growing commitments, it appears that actors have not yet given nutrition-sensitive agriculture the level of priority it requires. The recently established ‘Global Panel on Agriculture and Food Systems for Nutrition’ could be a vehicle for this, if it associates enough countries and civil society organisations with its work. Nutrition should also be made a high priority in international agriculture fora, particularly the CFS (Committee on World Food Security), as the most inclusive international policy forum focusing on agriculture, food security and hunger reduction.

Conclusions
The main finding of the report is that despite a rapidly growing agenda at the international level, including increased commitments from international institutions and donors, nutrition-sensitive agriculture is long overdue and to date has not sufficiently integrated nutrition at the level where it matters most. The constraints identified at country-level need to be addressed jointly, to transform the vicious circle of low consumer demand and underinvestment into a virtuous circle, to make agriculture more sensitive to nutrition at country level, the right set of incentives should be developed and embedded at different levels, from the highest policy framework to the day-to-day activities of extension workers in the field. These incentives should compensate for the lack of common language between agriculture and nutrition, the low level of knowledge on nutrition from the agriculture side and the weak accountability of the agriculture sector vis-à-vis nutrition. This last point is particularly important: the agriculture sector has for too long been evaluated on the basis of its contribution to income generation and economic growth, not on the basis of its contribution to better nutrition.

Recommendations
At the field level, the pathways between agriculture and nutrition are not that well-known. The role agriculture can play in nutrition should be made more explicit. The agriculture sector and the nutrition community should work together to identify what contributions the agriculture sector could bring to the fight against undernutrition in the country, depending on the context-specific determinants of undernutrition and characteristics of the agriculture and food systems. In Kenya, the Home Economics section of the Ministry of Agriculture (MOA) is an important actor which implements the nutrition mandate of the Ministry and provides support to nutrition-sensitive programmes. In fact, home economics officers are key nutrition information channels to change behaviour in the long term both at the national and at the local level.

Agriculture information systems rarely include nutritional and food consumption related indicators (such as the Household Dietary Diversity Score) into their methodologies and surveys. Better information and monitoring systems are needed linking agriculture and nutrition data. Such systems will support building and improving cross-sectoral analysis and dialogue around nutrition. This should include plans to monitor and mitigate the potentially negative consequences on nutrition that may arise from large scale, intensive agricultural investments. In Burkina Faso, the Permanent Agriculture Survey, implemented on a quarterly basis by the Ministry of Agriculture, has been collecting Mid-Upper Arm Circumference (MUAC) measurements of a sample of children under five years since 2004. This was initially done following a recommendation from regional institutions, to understand better the Sahel ‘cereal balance failure’ showing that agricultural availability does not automatically result in an adequate nutrition situation.

Multi-sectoral coordination mechanisms around nutrition, when they exist, are often primarily related to the health sector, especially at the national level. There is thus an institutional challenge to increasing the participation of the agriculture sector in coordination bodies, to facilitate cross-sectoral dialogue around nutrition. In Peru, the MCLCP is a consultative body facilitating consultation and communication in the fight against poverty. Created in 2001, it is an example of where State institutions and civil society collaborate to adopt agreements and coordinate activities to combat poverty in each region, department, province and district. Its mandate integrates nutritional issues for each sector to contribute to common goals. Its main functions are to monitor the implementation of the different government programmes but also to carry out joint advocacy messages.

There is a lack of both basic and on-the-job training on nutrition available for agriculturalists and extension service staff. There is a need for training on both general nutrition knowledge and specifically on the links between agriculture and nutrition. The training efforts should focus in particular on extension agents, whose role makes it possible to spread messages on nutrition to farmers and communities, but should also include civil servants from Ministries of Agriculture at central level. Burkina Faso is currently reforming the National Agriculture School curricula to include nutrition courses in the basic training of agriculture students. This reform has been identified as an important step to change the mind-set of agricultural civil servants vis-à-vis nutrition.

More funding is needed for agricultural programmes and interventions that will in particular take on board the following issues:
• set up targeting tools to ensure vulnerable communities will benefit from agricultural investments
• dedicate specific attention to the role of women in agriculture (in particular through increased access to land, inputs and income) while making sure nutrition gains are maximised for both mothers and children (through introduction of timesaving technologies, childcare nurseries when appropriate, and nutritional education and awareness-raising).

In Peru, RBB (results-based budgeting) is a public management system that ties the attribution of resources to measurable results. This mechanism is implemented through budgetary programmes under the Ministry of Finance, and reflects priority areas of public investments by local governments. The possibility of funding food security and agriculture programmes which fully integrate nutrition and incentivise cross-sectoral collaboration through this RBB tool is currently being discussed at the government level and seems promising.

Table 1: Outline of impact areas of agricultural development on nutrition

<table>
<thead>
<tr>
<th>From the Agriculture Side</th>
<th>To the Nutrition Side</th>
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<tbody>
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<td>Household production</td>
<td>Food consumption</td>
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<td>Income</td>
<td>Food purchase</td>
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<td>Income</td>
<td>Health care purchase</td>
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<td>Food prices</td>
<td>Food purchase</td>
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<td>Women’s use of time</td>
<td>Care capacity</td>
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<td>Women’s control of income</td>
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Research

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Comprehensive African Agriculture Development Programme, www.nepad-caadp.net
Mesa de Concertación para la Lucha contra la Pobreza (Peruvian body facilitating consultation and communication in the fight against poverty)
**Implications of 65 cm height cut-off as age proxy in Bangladesh**

**Summary of published research**

**Location:** Bangladesh

**What we know:** Age data for children aged 6 to 59 months is often not available in poor, migrant or conflict affected communities. Height cut-offs are often used as a proxy for age - 65 cm for 6 months of age and 110 cm for 59 months of age. No adjustment is recommended for cut-offs in stunted populations.

**What this article adds:** In a context of prevalent stunting (urban slum in Bangladesh), 12% of children aged 6 –59 months presenting to primary health care centres were classified for age using the height cut-off of 65 cm as age proxy, and thus were excluded from nutritional assessments. The majority (97.5%) of the exclusions occurred among those aged 6–17 months, an over-represented age group in the sample compared to population demographics. There is a need for research on context specific adjustment of height cut-offs. There are questions regarding interpretation of GAM prevalence rates by age group in stunted populations and a need to further investigate misclassification risk at 110cm cut off.

In the complex context of Kamrangirchar slum in Bangladesh, age verification of children during household or preventive screening by MSF was a challenge. The majority of the parents were absent or seeking work, and the caregivers were often family members or neighbours who didn’t know the real age of the child. To solve this practical problem, height cut-off thresholds were used as a proxy for age. As growth stunting is prevalent in Bangladesh, MSF hypothesised that a sizable proportion of children aged >6 months would be unlikely to have attained a height of 65 cm and would thus be excluded from nutritional assessment. This is of particular concern, as these children are more vulnerable to malnutrition and related mortality risks. Using data from primary health care centres, where age and height parameters were well recorded, an MSF team assessed the proportion of children aged between 6 and 59 months who would be excluded from sampling using the height cut-off of 65 cm as a proxy for age ≥6 months. The findings are summarised here.

**Method**

This was a secondary data analysis of routine primary health care (PHC) data, and included all children aged 6–59 months who attended the clinic for the first time between July and September 2011 in the Kamrangirchar slum. Kamrangirchar has a population of 400 000 living in an area of 3.1 km². The population is mainly formed of migrants, and mostly engaged in the labourers’ work. There are no governmental health services in the slum and PHC services are outsourced to NGOs. MSF PHC services are offered at two centres and focus on childhood malnutrition. All children presenting to the PHC for both preventive and curative care had their age, sex and anthropometric measurements recorded. Height/length was measured using a wooden stadiometer, with a precision of 0.1 cm. Weight was measured using a hanging scale, with an accuracy of 100g. Mid-upper arm circumference (MUAC) was measured with a tape measure. In each PHC centre there were two anthropometric measurers who had formal training in the measurement techniques. On-the-job supervision and refresher training were conducted at regular intervals to limit errors in measurement. Ages were verified using birth certificates, vaccination cards and local calendars of events.

Data obtained from the PHC register on height, age and sex were entered into EpiData version 3.1 (EpiData Association, Odense, Denmark) between November and December 2011. A sample size was calculated based on the hypothesis that 6% of the children attending the PHC aged 6–59 months were <65 cm in height. To detect the above with a 95% The required sample size was calculated to be 2072 children (95% confidence interval (CI) and 5% error). The study team determined the proportion of children aged 6–59 months who had not attained a height cut-off of 65 cm (95% CI and 5% error). To assess the representativeness of the age distribution of the study sample, data on the age distribution of children included in the MSF annual nutritional survey in Kamrangirchar in 2011 were compared with the study sample. Data entry was validated by comparing randomly selected entered data with the register; the data were then cleaned of errors and aberrant records.

**Results**

Data on 2,072 children were available in the electronic database. Twelve children were excluded from the analysis: nine were missing records on height and three had aberrant records (two with height and one with age). Of the remaining 2,060 children included in the analysis, 1,042 (51%) were males and the median age was 24 months. The median height was 78 cm, with a standard deviation of 0.50 (range 59–109 cm). On comparing the age distributions of the children included in the study sample with those included in the nutritional survey, which was based on a random cluster method, there was a significant difference between the age groups 6–17 and 42–53 months. Of the total sample, 240 (12%, 95% CI 10–13) children aged between 6 and 29 months had a height <65 cm. The majority of these children were females (59%) and aged between 6 and 17 months.

The study confirms the hypothesis that, in a context of prevalent stunting, 12% of children aged 6 –59 months are misclassified for age using the height cut-off of 65 cm as age proxy, and are thus excluded from nutritional assessments.

An important limitation of the study is that there might be an issue of representativeness of the sample, as it used PHC data; access to the PHC and morbidity might have an influence on the sample. Notably, the majority (97.5%) of the children who did not attain 65 cm in height were those aged 6–17 months. This age group constituted 35% of the study sample in comparison with 20% of the community survey. This might be explained by the fact that younger children tend to be more vulnerable to morbidity episodes, and as such often constitute a higher proportion of children attending PHC centres. On the other hand, repeated morbidity—which is more likely in the sample that presents to PHC centres—could influence retarded growth and thus increase the proportion of children in the age group 6–17 months, as seen in the PHC sample. This notwithstanding, the overall proportion of exclusion using the current height proxy of 65 cm is still too high.

**Discussion**

The study authors posit a number of key findings. First, about one in ten children who should undergo nutritional assessment in infancy were not assessed—the majority (97.5%) of the exclusions occurred among children aged 6–17 months, who are the most vulnerable age group for malnutrition-related morbidity and mortality. This finding also implies that standardised WHO growth chart data, used as the basis for determining proxy heights for age, are inappropriate in such contexts of prevalent stunting. Second, the findings beg the following question: what should be the ideal height proxy for 6 months of age in this setting? This would require a community cluster survey and validity analysis to determine cut-offs with the highest positive predictive value. Due to height stunting, the upper height cut-off of 110 cm as a proxy for 59 months of age might also misclassify children aged >59 months as being below that age, as they might not have attained a height of 110 cm. This will unnecessarily include children who are not in the target group for nutritional assessments. Here too, determining the ideal upper cut-off as an age proxy of 59 months will require further research. Third, and most importantly, the use of height cut-offs as proxy for age is likely to introduce bias in nutritional surveys assessing malnutrition prevalence in the age group 6–59 months. This could have implications, as nutritional interventions are guided by prevalence rates of malnutrition among such age groups. Fourth, the findings also highlight the need for national growth charts in a country such as Bangladesh, which has a high prevalence of stunting.
Perceptions of SAM treatment in infants under 6 months in Malawi

By Concetta Brugaletta

Concetta Brugaletta is a clinical research nurse working in neurology. Currently based in the UK, she is interested in infant malnutrition and holds a Masters in Clinical and Public Health Nutrition from University College London. She has four years of clinical experience in oncology and nearly two years of experience in child nutrition in Guinea Bissau and Malawi.

The author would like to thank her MSc supervisor, Dr Marko Kerac, for his guidance during the project described in this article. Marko Kerac gratefully acknowledges support from an Academy of Medical Sciences Clinical Lectures Starter Grant supported by the Wellcome Trust, the British Heart Foundation, Arthritis Research UK, the Medical Research Council, Prostate Cancer UK and the Royal College of Physicians (http://www.acmedsci.ac.uk/careers/funding-schemes/starter-grants/) for supporting the fieldwork described in this project.

This article is a summary of an MSc thesis.

Location: Malawi

What we know: The global burden of SAM in infants under 6 months of age is significant. To date, treatment options have depended on inpatient care. Community-based management is an option in the latest update of WHO guidance on SAM treatment. Context specific management options are lacking.

What this article adds: In Malawi, the perceptions of carers and health professionals regarding outpatient treatment of SAM in infants under 6 months were explored in a small qualitative study. Participants preferred inpatient management based on high expectations (rather than experience) of care. Early clinical signs of malnutrition were known but considered under-recognised in the community. Maternal mental health was not considered relevant. Priority actions included education of community leaders. Expectations are compatible with community-based care. A strong informal community network was identified that could help shape future interventions.

As highlighted by the Management of Acute Malnutrition in Infants (MAMI) project, malnutrition in infants below six months (infants <6m) has often been considered rare and has often been neglected. Yet, a recent study estimated that of 20 million children under five years of age worldwide, 3.8 million are infants <6m. CMAM (Community-based Management of Acute Malnutrition) treatment is modelled on outpatient treatment, targeting children 6-59 months. By contrast, international and national SAM guidance (including Malawi guidelines) for infants <6m, recommend only inpatient-based care. This may change with the just released WHO SAM guidelines. For the first time, these describe outpatient-based treatment options for infants <6m.

The motivation for this research was to respond to the knowledge gap of how Malawian carers and healthcare professionals will perceive future changes from inpatient to outpatient treatment for infants <6m and what benefits and risks they expect. The study also aimed to identify key elements that might help to roll out future infants <6m SAM guidelines at the country level.

Objectives
- To explore carer and health professional views and preferences regarding the existing management of SAM in infants less than 6 months.
- To analyse the risks and benefits of the community-based approach to infants <6m with SAM as perceived by these key stakeholders.
- To make recommendations, based on the previous two objectives, to improve eventual development and roll out of infants <6m SAM guidelines.

Methods
This was a qualitative study based on 12 interviews with health professionals (Nurses, Health Surveillance Assistants (HSAs)) and 20 focus group discussions (FGD) with carers (mothers, fathers and grandparents). The study was conducted in three urban and two rural health centres in the Blantyre district of Malawi. A pilot phase was conducted at the Queen Elizabeth Central Hospital, Blantyre. Further logistic support was given by the Malawi-Liverpool Wellcome Trust Science Communications team and by the Community of Sant’ Egidio.

A total of 143 people took part in the study. All participants signed informed consent. Sample size was determined by data saturation. Interviews and FGDs revolved around a topic guide. Most of the FGDs were conducted in Chichewa language, while all the interviews (mainly with healthcare workers) were conducted in English. Focus groups had 5-7 participants each. A thematic analysis methodology was used.

Results
The theme of infant malnutrition opened up different topics related to husband-wife relationships, the role of men and women in society, and the role of grandparents and traditional beliefs. The six major themes that emerged from the data (see Figure 1) were:
- Understanding of causes and symptoms of SAM in infants < 6m
- Perception of management of infants <6m with SAM at hospital level
- Perception of management of infants <6m with SAM at community level
- Caregiving resources (mother and household)
- Caregiving resources (community level)
- Perceived priorities for management of infant malnutrition

Both health professionals and carers were generally able to describe most of the multifactorial causes of malnutrition, including social and cultural, and the clinical symptoms of early and acute phases of SAM. However the early signs of acute malnutrition in infants <6m were considered under-recognised in the community. Most health workers relied on weight based anthropometric assessment; advantages of using MUAC assessment in this age group were recognised but some expressed doubts about its use in very young infants.

Among the causes of malnutrition, behavioural taboos were commonly mentioned in interviews and FGDs, e.g. unfaithfulness or another pregnancy. Most people considered causes related to the ability of the mother to produce enough milk, due to lack of food for example, rather than the causes related to the infant. The relationship between maternal mental health and child health was poorly understood and not considered to be a common factor.
Participants instinctively preferred the inpatient-based approach to treating infants <6m with SAM. This preference was based on relatively superficial risk-benefit judgments and (unrealistically) high expectations of care in this setting, not necessarily based on experience, e.g. hospitals viewed as educational centres of excellence, medicine and food availability with inpatient treatment.

Participants were asked who they seek help from in the community setting if infants <6m are malnourished. The majority identified the HSA, who is trained and close to the community, as well as the Community Advisory Group (CAG) volunteers, who are present in the rural centres, chosen from the community and receive training on a health topic. Regarding outpatient treatment, respondents reported advantages (able to look after the home and older siblings) and disadvantages (challenge to follow prescribed care, sharing food with siblings, and weak community settings where mothers have little support). Family support included fathers, as provider and a key decision-maker on infant health, grandmothers and older siblings. “Well educated” women, in particular, influenced infant related decisions.

Participants identified that a priority for addressing infant malnutrition problems was more education at the family and community level, targeting key community figures such as HSAs, village chiefs, grandparents, religious leaders and traditional doctors. Interviewees preferred to receive training and education in groups in order to learn from each other and to access peer support, but favoured individual case management.

Conclusions

The approach to managing infants with SAM must be framed in the context of both the mother-infant dyad and wider social-family relationships (e.g. fathers and grandparents). To do this, close engagement with families and communities is crucial. Four out of six of the main themes emerging from the data were related to caregiving resources in the community. Expectations expressed for inpatient treatment were not incompatible with community-based care. A strong informal community network exists in this Malawian community that can support the mother-infant dyad and could help shape future interventions.

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Figure 1: Map of themes and associated codes

<table>
<thead>
<tr>
<th>Theme 1: Understanding of causes and symptom</th>
<th>Theme 2: Perception of management of infant with SAM at hospital level</th>
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<tbody>
<tr>
<td>1 Clinical causes</td>
<td>1 Expectation</td>
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<tr>
<td>2 Social causes</td>
<td>2 Benefit/Advantage</td>
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<tr>
<td>3 Cultural causes</td>
<td>3 Risk and disadvantage</td>
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<tr>
<td>4 Symptoms/assessment ability</td>
<td>4 Risk and disadvantage</td>
</tr>
<tr>
<td>5 Ability to recognise symptoms assessment ability</td>
<td>5 Benefit and advantage</td>
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<tr>
<th>Theme 3: Perception of management of infants with SAM at community level</th>
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<tr>
<td>1 Role of HSA</td>
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<tr>
<td>2 Traditional healers</td>
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<tr>
<td>3 CAG</td>
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<tr>
<td>6 CITE</td>
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<th>Theme 4: Caregiving resources (mother and household)</th>
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<tbody>
<tr>
<td>1 Father role</td>
</tr>
<tr>
<td>2 Mother’s role and mental health</td>
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<tr>
<td>3 Grandparent’s role</td>
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<tr>
<td>4 Family decision making process</td>
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<tr>
<td>5 Ability to recognise symptoms/assessment ability</td>
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<td>6 CITE</td>
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<tr>
<th>Theme 5: Caregiving resources (community level)</th>
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<tbody>
<tr>
<td>1 Group role</td>
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<td>2 Church group role</td>
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<tr>
<td>3 Peers role</td>
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<tr>
<td>4 Role of community leaders</td>
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<tr>
<td>5 Individuals</td>
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<tr>
<th>Theme 6: Perceived priorities for management of infant malnutrition</th>
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<tbody>
<tr>
<td>1 How people feel able help</td>
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<td>2 Training</td>
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<tr>
<td>3 How government can help</td>
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<tr>
<td>4 First aid support box</td>
</tr>
<tr>
<td>5 How people feel able help</td>
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HSA: Health Surveillance Assistant; CAG: Community Advisory Group; CITE: Community Initiative for Tuberculosis Eradication

Anthropometric predictors of mortality in undernourished adults in southern Sudan

**Location: South Sudan**

**What we know:** Acute adult undernutrition tends to occur in prolonged severe famines. There is a lack of evidence on which anthropometric measure best identifies those adults most at risk of death and which treatment protocols to use. Chronic disease presence and treatment availability will impact on adult nutritional status and response to nutrition treatment.

**What this article adds:** Admission and outcome data for 197 adults treated in a therapeutic programme in South Sudan were analysed. The HIV burden was low in the population. Treatment was successful (74% cure rate, 11% mortality) modelled on child protocols. Oedema on admission increased the odds of death by 15 times and accounted for over half of deaths. For every 1-cm increase in MUAC, the odds of mortality decreased by 58%. No significant interaction was found between MUAC and oedema in predicting mortality. Mean BMI on admission was 12.6 and as low as 8 but admission BMI was not significantly associated with subsequent mortality.

A group of researchers recently analysed data from the 1998 Ajiep feeding programme in southern Sudan to assess the predictive power of mid upper arm circumference (MUAC), weight, body mass index (BMI), and oedema values for adults on admission for subsequent mortality. This was a low HIV burden context. This study was conducted as part of an operational therapeutic feeding programme to inform the selection of appropriate tools to diagnose adult undernutrition in both famine and non-famine contexts.

**Context**

In 1998, a major famine occurred in southern Sudan. According to burial surveillance systems in major towns, crude mortality rates were frequently between 20 and 30/10,000 daily, 20-30 times the threshold used to define an emergency. Concern Worldwide implemented an adult therapeutic feeding centre in Ajiep from October 1998 to January 1999. Criteria for admission into the therapeutic feeding programme were primarily MUAC-based and the principles of the therapeutic regimen were identical to those for children (see Box 1).

Trained health workers obtained patient identification information and anthropometric measure- ments at admission and throughout the patient’s stay in the therapeutic unit. A physician conducted a clinical examination and initiated both routine treatment and specific treatment of any complications that had been diagnosed. There were five outcome categories in this observational study: cured (resolution of clinical symp- toms and consistent weight gain), death (any death during treatment or within 2 weeks after defaulting from the treatment centre), transfer to another feeding centre, referred to a hospital for further treatment, and defaulted (absent for more than 7 days without having been medically discharged or referred).

**Analysis method**

Admission data were mainly used in the analysis, because the intention was to assess the effect of patients’ nutritional status at admission, on treatment outcomes, and the relation between the different admission anthropometric measures. This analysis showed that all three anthropo-

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2. BMI was calculated as weight (kg)/height (m) squared.
Results
A total of 469 patients, aged 2 months to 77 years, were treated in the Ajep therapeutic feeding centre between 9 October 1998 and 14 January 1999. Of these, completed data for 197 adults aged between 18 and 59 years were available and analysed for this study. More than two-thirds of the subjects were women (n = 138, 70%).

No statistically significant differences in mean BMI (P = 0.55) or mean MUAC (P = 0.09) were observed by gender. On average, the men (n = 59) were heavier and taller than the women (n = 138; P < 0.001). Neither MUAC on admission (ANOVA: P = 0.7) nor BMI on admission (ANOVA: P = 0.8) differed significantly by gender. In both men and women, mean MUAC, weight, and BMI were higher in oedematous than in non-oedematous patients (P < 0.001).

MUAC had better sensitivity and specificity in predicting mortality than did BMI with weight having the lowest (P = 0.01). The most discriminatory threshold was determined as the anthropometric threshold with the highest value for sensitivity plus specificity: < 15.6 cm for MUAC and < 12.0 for BMI.

Treatment outcomes
Analysis of treatment outcome showed that 145 patients (74%) exited the feeding centre as cured, 22 (11%) died, 10 (5%) defaulted, and 19 (9.7%) were discharged as improved. For those patients who died, mean MUAC, weight, and BMI were higher in oedematous than in non-oedematous patients (P < 0.001).

Discussion
Acute adult undernutrition tends to occur in prolonged severe famines. This study was the first to document levels of BMI as low as 8.0, previously thought to be incompatible with survival. Mean BMI on admission was 12.6, well below current accepted BMI thresholds for defining severe undernutrition in adults. Studies conducted during the famine in Somalia of 1992 documented BMI values as low as 10.

The Ajep study confirmed the conclusions of a small number of previous studies that suggest that relatively high rates of recovery are possible when treating even severely emaciated adults with therapeutic protocols, similar to those used and formally evaluated for malnourished children – based on low-protein, high-frequency regimens. The finding of higher odds of death in men than in women after adjustment for oedema and MUAC, despite there being no significant difference in nutritional status on admission, is also consistent with previous studies. It is likely due to the natural tendency for women to have a higher proportion of body fat that they can draw on.

Another major finding is that admission MUAC was more strongly associated with subsequent risk of death than BMI. MUAC and oedema were the only variables that were independently associated with mortality in this study. In addition, the relation between MUAC and mortality showed a dose-response or incremental pattern. The odds of death decreased by a very substantial 58% for every 1-cm increase in mean MUAC on admission. In contrast, no difference in mean BMI on admission was found between survivors and those who died. BMI was initially developed as a tool to assess overweight and obesity, which makes interpretation of BMI unreliable. These factors may have trouble standing, which makes a height measurement inaccurate. This study is also the first to document the influence of oedema on interpretation of MUAC. In addition, MUAC was significantly and independently associated with mortality. As well as being a precise and reproducible indicator, MUAC is a far more practical tool than BMI in situations of severe and prolonged famine. Severely emaciated adults may have trouble standing, which makes a height assessment both difficult and inaccurate. In addition, food security crises are more common in pastoralist communities with Nilotic ethnicity in the Horn of Africa. Such communities may have a mean Cordic index (sitting height:standing height ratio) that differs significantly from reference populations, which makes complex adjustment in BMI necessary. All these factors indicate that MUAC is likely to be a better tool for assessing acute undernutrition in adults than is BMI, especially in the resource-poor areas where the great majority of famines occur.

The data from this study were derived from a therapeutic feeding centre operating at the height of a famine under extremely insecure and difficult field conditions. Study participants were selected on the basis of being severely undernourished, as such, the findings may not be generalisable to a population of adults that includes moderately and/or mildly malnourished adults. In addition, sample sizes, particularly for men, were relatively small and resulted in wide CIs for the adjusted ORs. Finally, the relationship between anthropometric and clinical programme indicators and mortality were measured in the presence of an active therapeutic nutritional and treatment programme, so it is not possible to know which patients would have died if this programme had not been in place or whether the relations between the anthropometric and clinical measures and mortality would have been the same in that situation.

Finally, there are no accepted international thresholds for MUAC assessment of acute undernutrition in adults.

Despite the limitations of the study, the authors believe that in combination with other previous research, the current study provides sufficient evidence to recommend MUAC over BMI as the tool of choice for measurement of acute undernutrition in adults. However, further research on a population basis and from rigorously designed controlled trials within adult therapeutic feeding programmes will be required to refine admission and discharge thresholds for MUAC. Such research will need to determine whether criteria should be identical for men and women. Evidence from managing undernutrition in chronic diseases, such as HIV and tuberculosis, will also help establish thresholds.
Comparison of milk free v milk containing RUTF in SAM treatment in Zambia

Summary of published research

Location: Zambia

What we know: Global SAM treatment relies on internationally produced RUTF that is expensive. RUTF formulations that exclude the milk ingredient (that is often unavailable and is expensive) and that use locally available foods may increase access to treatment.

What this article adds: The effectiveness of a soy–maize-sorghum based RUTF formulation using local ingredients was compared to a peanut/milk-based RUTF in an urban outpatient setting in Lusaka, Uganda. Overall, the recovery rates were higher with the peanut/milk based RUTF but the study was inconclusive. Results suggested that the soy–maize-sorghum RUTF might be inferior to peanut/milk-based RUTF for children <24 months but not so for children ≥24 months. The study was limited by external factors contributing to higher default and death rates in an already challenging urban programme.

A recent study set out to compare the equivalence of a milk-free soy-maize-A recent study set out to compare the equivalence of a milk-free soy-maize-sorghum-based ready-to-use therapeutic food (RUTF) to standard RUTF. To date, the internationally accepted RUTF has been made from peanut paste, dried skimmed milk, oil, sugar and mineral vitamin mix largely made in France. The use of this peanut/milk-based RUTF (P-RUTF), coupled with increasing access to CMAM services, has been associated with high recovery rates, lower case fatalities and greater weight gain of children with SAM.

A number of factors limit availability of P-RUTF to those who need it, particularly cost (P-RUTF is an expensive $3.50-$4.00 per kg, milk powder accounts for 50% of costs), lack of locally produced milk powder where SAM is prevalent, and difficulty meeting US aflatoxin standards for locally produced peanuts. These factors increase costs, working capital requirements and the lead times for RUTF manufacture and procurement. A new RUTF formulation is required that can be manufactured more safely and cheaply manufactured in the countries where it is needed, using locally available foodstuffs such as legumes/pulses (e.g. soybean, chickpea, lentils) and grains (e.g. rice, maize, sorghum, millet), and limiting or eliminating the milk content.

A newly published study tested the effectiveness of a new RUTF formulation (soy—maize—sorghum—based (SMS)-RUTF) for the outpatient treatment of SAM without complications. The SMS-RUTF was made in Kenya from soya, maize, sorghum, oil, sugar and a mineral vitamin mix and contained no milk powder or peanuts. At the time of the study, using Kenyan market prices, the cost of ingredients for producing one metric ton of SMS-RUTF was USD $1,583 compared to an ingredients costs of USD $2,393 for one ton of P-RUTF.

Study method

The study was conducted between June 2009 and August 2010 in the health care (HC) clinics run by the Lusaka District Health Management Team in Lusaka, Zambia. Study eligibility required a clinic to have HC status, have a well-established outpatient therapeutic programme (OTP) that had been running for at least 6 months and have already treated a caseload of over 100 SAM children. Twenty-four of the 26 HCs met the criteria, were recruited and completed the study. This was a non-blind, parallel, group, cluster randomised equivalence trial with the randomisation to either SMS-RUTF or P-RUTF arms occurring at the level of the HC. The study could not be blind because of product differences in packaging and taste. The cluster design was chosen to try to address the risk that caregivers and health workers would be biased in favour of the already well-known P-RUTF.

Children recruited and completed the study. This was a non-blind, parallel, group, cluster randomised equivalence trial with the randomisation to either SMS-RUTF or P-RUTF arms occurring at the level of the HC. The study could not be blind because of product differences in packaging and taste. The cluster design was chosen to try to address the risk that caregivers and health workers would be biased in favour of the already well-known P-RUTF.

Children were aged between 6 and 59 months and had been diagnosed with SAM without complications after presenting to one of the 24 HCs. The diagnostic criteria for SAM was a mid-upper arm circumference (MUAC) <11.0 cm or pitting oedema of grade 1 (+) or 2 (++) . Complications were defined as either medical (using the World Health Organisation’s (WHO) Integrated Management of Childhood Illness (IMCI) standard definitions) or the absence of appetite (15 min appetite test), determined by a trained nurse. Children with SAM who presented with complications were referred to one of the four inpatient stabilisation units (SC) and were not eligible for this study. All other SAM cases were admitted to the OTP and included in the trial. Children previously discharged from the study with a recovered outcome that later relapsed and presented again at the one of the participating HCs with a new episode of SAM were not eligible for enrolment in the study a second time.

Stratified cluster randomisation was used to allocate the 24 HCs into intervention (SMS-RUTF) and control (P-RUTF) arms (12 each). Children who initially accepted the SMS-RUTF but subsequently refused were transferred to the P-RUTF. These children were kept in the SMS-RUTF group for the intention-to-treat analyses (ITT) but were excluded from the sample for the per protocol (PP) analyses.

All enrolled children received a 5-day course of amoxicillin, a single 100 mg dose of mebendazole, a 1 week ration of RUTF and health and nutrition advice. The RUTF ration was calculated to provide 200 kcal/kg/day. All children were asked to return to the HC for a follow-up visit once a week until they were discharged from the programme. At each follow-up visit, MUAC, oedema and weight were recorded and the children were screened for medical problems and appetite. Caregivers were interviewed at each visit about the acceptability of the RUTF and a repeat one week ration of RUTF was provided at the same dosage rate. Children were also asked about whether they had eaten an RUTF formulation other than the one to which they had been allocated.

Outcomes

Children exited the study in one of five ways: recovery (cure), death, default, transfer out of the catchment area and non-recovery. For children admitted with a MUAC <11.0 cm, recovery was defined as a weight gain of at least 18% and MUAC >11.0 cm and no medical complication and the absence of bilateral pitting oedema. In the case of children admitted because of bilateral pitting oedema, recovery was defined as the absence of bilateral pitting oedema, and clinically well and a MUAC >11.0 cm.

A child was considered to have defaulted if absent for three consecutive visits. Defaulters were followed-up and invited back into the programme by trained volunteers and those who returned were given a new outcome based on their status when they exited the programme. At the end of the study, all remaining defaulters were traced and classified as alive, dead or in the case of those not found, as lost-to-follow-up (LTFU). Verbal autopsy was carried out. A number of external factors increased the risk of default and death while at the same time decreased the ability of the staff to manage the programme and trace defaulted children. The resultant negative impact meant that both study arms suffered similarly high default rates and neither the P-RUTF nor the SMS-RUTF attained a recovery rate of 75%, the level considered acceptable for CMAM services. This is very different to the 3 years that preceded the study, when the default rate of the Lusaka CMAM programme was below 20% and the mortality rate was below 5%. The PP analysis suggests that in the absence of this increased defaulter rate, the recovery rate for both the RUTFs would likely have been above 70%.

Despite the non-equivalence in recovery rates in the overall study result, the researches believe that the similar mortality rates in each arm, the 70% recovery rate and the equivalence to P-RUTF observed in the PP analysis for children above 23 months, merit further investigation. However, those receiving P-RUTF had higher rates of weight gain and reduced length of stay compared to those receiving SMS-RUTF. This decreased the total cost parameters. Future studies on the public health impact of new RUTF recipes should include a comprehensive cost effectiveness analysis to assess the relative importance of the different cost parameters.

Discussion

Overall recovery rates, the primary outcome for this study, were higher in the P-RUTF than in the SMS-RUTF arm but the study was inconclusive and did not confirm our hypothesis of equivalence between the two different RUTFs in the treatment of SAM. However, there was evidence of a possible heterogeneity of treatment effect between children <24 months and those ≥24 months, with a suggestion that although the SMS-RUTF might be inferior to P-RUTF for children <24 months, this might not apply to children aged ≥24 months.

This was an effectiveness study implemented as part of the routine operations of a primary health care programme treating SAM and the results need to be interpreted in the context of the difficult and unpredictable urban environment within which the study was carried out. A number of external factors increased the risk of default and death while at the same time decreased the ability of the staff to manage the programme and trace defaulted children. The resultant negative impact meant that both study arms suffered similarly high default rates and neither the P-RUTF nor the SMS-RUTF attained a recovery rate of 75%, the level considered acceptable for CMAM services. This is very different to the 3 years that preceded the study, when the defaulter rate of the Lusaka CMAM programme was below 20% and the mortality rate was below 5%. The PP analysis suggests that in the absence of this increased defaulter rate, the recovery rate for both the RUTFs would likely have been above 70%.

Despite the non-equivalence in recovery rates in the overall study result, the researchers believe that the similar mortality rates in each arm, the 70% recovery rate and the equivalence to P-RUTF observed in the PP analysis for children above 23 months, merit further investigation. However, those receiving P-RUTF had higher rates of weight gain and reduced length of stay compared to those receiving SMS-RUTF. This decreased the total cost parameters. Future studies on the public health impact of new RUTF recipes should include a comprehensive cost effectiveness analysis to assess the relative importance of the different cost parameters.
Maternal Nutrition in Emergencies: technical review and round table discussion

By Emily Mates and Tanya Khara

Emily Mates is a Technical Director with the ENN. Tanya Khara worked as an ENN consultant on the project.

Through the INSPIRE consortium, the European Commission (ECHO) commissioned the ENN to conduct a technical review of maternal nutrition in emergencies. The ENN undertook this review recognising it as a critical technical gap area.

Location: Global

What we know: The nutritional status of a woman is crucial for her wellbeing and that of her children. There is a gap in policy and guidance on maternal nutrition in emergencies.

What this article adds: There are gaps in evidence to inform nutrition specific interventions (acute malnutrition management and micronutrient supplementation) and in particular, nutrition sensitive interventions (involving food assistance, health, agricultural, protection or education, for example). The nutritional needs of mothers in their own right, not just in terms of their infant’s health, and of adolescent mothers are neglected. Specific gaps include how to integrate maternal nutrition into assessment and response analysis and how to target interventions. Recommendations for practice include that programmes provide an optimal diet based on maternal nutrition requirements, that maternal nutrition interventions link to obstetric care, and that childcare implications of interventions must be considered.

Current evidence underlines the importance of the nutritional status of women as a crucial factor in the survival, healthy growth and development of her children. Although it is the subject of less global attention, maternal nutrition is also crucial for women’s own ability to live a healthy life.

The European Commission’s Humanitarian Aid and Civil Protection department (DG ECHO) was concerned that there are a number of gaps at policy and practice levels and limited guidance available to efficiently and effectively address the needs of maternal nutrition in emergencies. ECHO thus commissioned a review of maternal nutrition in emergencies which comprised preparation of a technical background paper by the ENN and organisation of a technical round table meeting by the INSPIRE Consortium in Brussels in November 2014. The background paper prepared by the ENN formed the basis for the roundtable discussions.

Summary of technical background paper

The technical background paper identified a number of gaps in the area of maternal nutrition in emergencies. An extensive literature review was conducted (using search engines google, bing and pubmed), summarising the available literature relating to: women’s particular nutritional vulnerabilities, what the implications of these are for women and their infants, current international guidance on maternal nutrition and what is currently being done in emergency programming.

Women are particularly vulnerable to undernutrition from a physiological point of view due to their increased nutrient requirements, both during their lifecycle and when considering their reproductive role. A recent review of evidence indicates that maternal nutrition is of great concern in many countries, many of which experience the most frequent humanitarian emergencies. Underweight, stunting, anaemia and vitamin A deficiency rates are extremely high; with iodine deficiency also creating considerable problems both for the mother and for the healthy development of her infant. Substantial gaps have been reported between micronutrient intakes and requirements for women of reproductive age in diverse resource poor settings, which are not currently well addressed through supplementation programmes. Evidence is growing of the critical role that essential fatty acids have in the development of a healthy foetus and for maternal mental health and wellbeing. Early marriage and pregnancy during adolescence is particularly worrying as it occurs while the girls are still growing themselves, interfering with growth patterns and increasing the risk of obstetric complications.

Women’s vulnerabilities in the humanitarian context are increased for a host of reasons, for example: the likelihood that during crises they might eat less; increased activities outside of the home environment as coping strategies are employed; increased risk of psychological problems due to stress or conflict situations; heightened risk of gender based violence; disruption of ‘normal’ services such as antenatal or reproductive health; disruption of breastfeeding; etc. The implications of these heightened vulnerabilities are many and varied. For women, increases in micronutrient deficiencies can have major impacts on mortality risks, while reduced immunity (due to pregnancy) can increase risks of contracting infectious diseases such as malaria. Maternal acute undernutrition predisposes the foetus and infant to greater risk of many problems, e.g. poor macro or micronutrient intake by the mother can lead to more low birth weight (LBW) or small for gestational age (SGA) births. This leads not only to much higher risks of neonatal mortality, but also higher risk that surviving infants develop non-communicable disease, such as diabetes, later in life. Undernourished infants who do survive are more likely to grow into shorter adults, have lower educational achievements and for girls, more likely to give birth to smaller infants themselves, thus perpetuating the intergenerational cycle of undernutrition.

Current international guidance on maternal nutrition has been very limited until recently, with the submission to the World Health Assembly of a 2012 WHO report ‘Nutrition of women during pregnancy’. The Scaling Up Nutrition (SUN) framework includes a number of direct interventions for maternal nutrition, although the emergency context is not specifically dealt with in any of these recent reports or compilations. The Sphere project 2011 also gives some key actions and guidance notes for direct interventions to support maternal nutrition; however most are linked to infant feeding and the welfare of the child, while the Global Nutrition Cluster (GNC) 2013 handbook does suggest the inclusion of women in supplementary feeding.

For macronutrient supplementation, provision of nutritional advice and balanced energy and protein supplements to undernourished pregnant women is strongly recommended. Additionally, evidence is growing, that improving the diets during the early stages of pregnancy can have as much effect on improving birth weights as supplementing during later pregnancy. More evidence is required of the effect of essential fatty acid supplementation, although early indications are that it could have a beneficial effect on both maternal wellbeing and breastmilk composition. During emergencies, the latest guidance from the GNC in 2012 is that all pregnant and lactating women (PLW) with moderate acute malnutrition should be included in targeted Supplementary Feeding Programmes (SFPs), regardless of their age or pregnancy status. The evidence base for the benefits of blanket SFP needs to be strengthened before clear guidance can be given. Some cultural perceptions that supplementary feeding can increase the incidence of...
obstructed labour (due to larger size of the foetuses) was reported, however no published evidence of this could be located during the literature search.

In terms of micronutrient supplementation, strong evidence supports the provision of iron and folate for pregnant women. Additional prevention, diagnostics and treatment of malaria in endemic areas is important to prevent any negative effects of this supplementation. Evidence is growing, but consensus has not yet been reached to recommend the provision of multiple micronutrients (MMN). A combination of iron/folate supplementation for PLW is also recommended in areas where universal salt iodisation is not fully implemented. Calcium supplementation for pregnant women in areas of low calcium intake is strongly recommended, along with vitamin A supplementation; especially in areas where deficiency is a severe public health problem. During emergencies, MMN tablets are recommended for pregnant women due to the likelihood of increased deficiency in populations at risk, iodised salt should be used for all general food distributions and vitamin A supplementation is strongly recommended for all PLW (for lactating women, within 6 weeks of delivery).

For the care and support aspect of maternal and infant health and wellbeing, breastfeeding care and support is strongly recommended, which includes: assessment of breastfeeding challenges, provision of a package of support services, support for safe and appropriate alternative feeding where required, and promotion of international codes, resolutions and national laws regarding the marketing of breast milk substitutes. Caring for the caregivers is also a vital aspect, particularly during emergency situations where conflict and stress have been encountered.

The provision of insecticide treated bed nets is recommended for all pregnant women, as is prophylactic malarial treatment in endemic areas. Prophylactic treatment for intestinal parasites is also recommended for women in the 2nd and 3rd trimester of pregnancy. Provision of a minimum package of reproductive health services is strongly recommended, to ensure appropriate antenatal care (ANC), safe delivery and availability of post-partum services. A focus on adolescents is highlighted as critical for efforts to reduce the incidence of LBW.

Nutrition sensitive interventions have yet to produce the evidence linking particular interventions in food assistance, health, agricultural protection or education sectors to nutritional outcomes for women or children; although this may in part be due to the weaknesses of measuring nutrition outcomes in programming to date. More evidence is clearly required before any associations or cause and effect relationships can be adequately described. Some studies have demonstrated a relationship between women’s empowerment and nutrition and also of a relationship between women’s disempowerment and adverse nutritional impacts. More work is however required, for concrete guidance to be given. While cash transfers/voucher programmes are becoming more common, there is little evidence yet for any improvement of nutrition outcomes during emergency programming. Again, more work is required to establish associations and effects (positive or negative). Furthermore, food assistance programmes must be developed using a nutrition sensitive lens, in order to reduce the risk of inadvertently undermining efforts to improve maternal nutrition, for example by increasing their physical workloads.

There is limited guidance on effective assessment and the appropriate response, with the targeting of PLW in emergency situations usually being conducted through the upper arm circumference (MUAC) measurements. It has been suggested that it would be more appropriate to use population level targeting for all women (including adolescents), although current practice sees interventions usually only targeting PLWs through SFPs and some micronutrient supplementation. Mapping of the most common emergency interventions was conducted in 2012 which has helped identify where, and how many, women have been included in SFPs. Performance data from the programmes targeting women were, however, insufficient for analysis; a recurring theme for studies looking at outcomes of emergency interventions for women, including those using nutrition education and counselling (NEC) techniques (despite the frequency of these strategies being deployed). Use of Lipid-based Nutritional Supplements (LNS) for women is a relatively new area where research is currently being conducted. Routine monitoring of data from these programmes were almost completely lacking and no financial information specifically related to maternal nutrition in emergencies was found during the literature search.

The review concluded with a summary of specific knowledge and guidance gaps, including: • How should maternal nutrition be reflected at assessment and response analysis stage? • Who to target? Which maternal anthropometric and demographic characteristics should be used, if any, for inclusion into nutrition interventions, and for discharge? • What to do? • How to do it? • What to use? • How to monitor?

Technical round table meeting, Brussels, November 12th 2014

A one-day technical roundtable on “Maternal Nutrition in Emergencies” was convened by DG ECHO, organised by the INSPIRE Consortium and facilitated by the ENN. The meeting brought together key DG ECHO technical staff and partners, agency nutrition focal points, donors and technical experts. The aim of the round table was to discuss the evidence, current practice and issues related to maternal nutrition in emergencies and to suggest priority actions and initiatives required to address the gaps and challenges highlighted in the technical background paper.

The meeting was structured into three topic sessions:

• Nutrition specific interventions – micronutrient supplementation
• Nutrition specific interventions – acute undernutrition
• Nutrition sensitive interventions to support maternal nutrition

Each session consisted of one or two presentations from key experts in the field to provide insights into the above topics. This was followed by discussion among the participants. For the nutrition sensitive interventions, the group was split into two: one group covering food security and water, sanitation and hygiene (WASH) and the second dealing with health, women’s empowerment and mental/psychosocial support. A number of key questions based on the gaps identified in the technical background paper were used as triggers for the discussion. During each session four areas were drawn out from the discussion by the facilitators: recommendations for practice, research gaps, areas for wider discussion (other sectors/groups) and policy gaps.

A final session brought together all the outputs from the above four areas and a prioritisation exercise was carried out to identify the major recommendations of the group, outlined in Table 1.

**Main recommendations for policy gaps**

Policy recommendations occupied a ‘cross cutting’ space in the discussions, and were:

• The nutritional needs of adolescents and adolescent mothers in particular, are not currently on the radar in either policy or guidance for emergencies.

• Recognition that the nutritional needs of lactating women themselves, rather than their needs to produce a healthy infant, are being neglected.

• The aims and outcomes for maternal nutrition interventions in emergencies need to be clearly defined.

• There is a need for agreed definitions of maternal nutrition, maternal malnutrition and what this means in the emergency situation.

For more information, contact: Emily Mates, email: emily@ennonline.net

<table>
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**Research**
Achieving resilience in different livelihood contexts

Summary of report

Location: Africa and Asia

What we know: Building resilience is widely referred to in Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) strategies. Most DRR activities focus on reducing household vulnerability and increasing capacity to cope. Household diversification and increasing agricultural production are common approaches.

What this article adds: Household Economy Approach (HEA) data contributes to DRR by providing a vulnerability map that considers interactions between hazards, vulnerability and coping. Save the Children undertook preliminary analysis of HEA data from 300 distinct livelihood zones in 26 countries. Crop shocks had the most damaging effect on livelihoods in 233 livelihood zones. livelihoods are increasingly dependent on food purchase. The efficacy of diversifying livelihoods to increase resilience and reduce risk is questioned. Increasing income appears critical to reduce risk. Resilience programmes should conduct ‘pre-flight’ analysis on their interventions.

A recent report published by Save the Children is one of a series of five reports and papers that aims to give critical insights into key questions about what resilience means and how to achieve it in different livelihood contexts.

The report presents evidence from a consolidated set of household economy data from more than 300 distinct livelihood zones in 26 countries: Botswana, Burkina Faso, Cambodia, Chad, Colombia, Djibouti, Ethiopia, Haiti, Indonesia, Côte d’Ivoire, Kenya, Lesotho, Liberia, Mali, Mauritania, Mozambique, Myanmar (Burma), Namibia, Niger, Nigeria, Pakistan, Rwanda, Senegal, Somalia, Uganda, and Zimbabwe. It attempts to answer key questions (operational and policy-related) about disaster risk reduction (DRR) and climate change adaptation (CCA) in a range of livelihood contexts:

1. Which single shock has the most damaging impact on households’ ability to meet their minimum food and livelihood requirements?
2. Does diversification always help reduce the risk of disaster?
3. Will increasing poor households’ agricultural production increase their resilience in the face of climate change?
4. What hazards are pastoralists most vulnerable to and what does resilience mean for a pastoralist economy?

The Household Economy Approach (HEA) database helps shed light on the risk of livelihood crises within the context of a shifting and dynamic set of natural and man-made hazards. If the goal of DRR is to reduce the risk of disasters (R), the overarching operational questions relate to how this can best be done. Actions can be directed at reducing the frequency and magnitude of different hazards (H) and/or towards reducing people’s vulnerability (V) to the hazards and/or increasing their capacity to cope (C). Most DRR activities today are aimed at achieving the latter because it is generally accepted that natural hazards are not – at least in the short term – amenable to human intervention. Building ‘resilience’, widely referred to in DRR and CCA circles, encompasses these last two components of the DRR formula (V and C). DRR is a unique field of work as it is based on a proposition of conditionality. If we can reduce vulnerability and increase people’s ability to cope, we will reduce the risk of disaster occurrences. But people are variably vulnerable to different hazards; rain fed-dependent farmers are highly vulnerable to drought, while poor urban dwellers are highly vulnerable to changes in food prices. Analysing the interaction between hazards and vulnerability and coping capacity in both current and future settings is what moves DRR beyond the static field of traditional emergency assessment and response into a dynamic arena of risk analysis and mitigation. The report authors argue that HEA’s unique ability to conduct dynamic scenario analysis is what makes it so appropriate for DRR related enquiries, supported by the limited analysis conducted for the report, and summarised here.

Contribution of HEA to DRR

An early warning and prospective disaster risk assessment system that is customised to pick up on the spatial variations in underlying livelihoods will be more accurate than one that is focused solely on hazards. HEA data contribute to the early warning and risk assessment component of DRR by providing a vulnerability map that is disaggregated to reflect areas where people are bound by a common vulnerability to the same hazards.

Crop shocks had the most damaging effect on livelihoods for the households in the 233 livelihood zones assessed. But livestock, purchase and labour shocks – far less commonly monitored throughout the world – can also cause substantial damage and, depending on the livelihood zone, can be far more critical than crops. Monitoring systems need to make a concerted effort to integrate mechanisms for systematically and effectively monitoring these critical shocks (in addition to crop production) if prospective disaster risk assessments hope to get things right. Across all livelihood zones, price shocks create a significant impact, second only to crop shocks. This reflects the high degree to which poorer rural households today are heavily reliant on purchasing their food. In an increasingly globalised world, price shocks reduce food access for both urban and rural households, which are increasingly tied to global markets. Given the fundamental connections between the two primary production systems (crop and livestock) and household sources of food and cash income – as well as the economic arrangements linking poor and better-off households – it is not clear what a realistic picture of a truly diversified livelihood looks like in rural areas. With the exception of off-farm labour/employment and certain types of self-employment, few rural options offer protection from the primary production hazards.

Questions raised

Overall, the report raises questions about the efficacy of pursuing a strategy based on diversifying livelihoods to increase resilience and reduce risk. Increasing levels of income, as well as finding truly independent income sources within a diversifying rural economy, appear to be critical for reducing risk and building resilience. It is not clear that improving smallholder agriculture on its own provides significant protection against disaster risks, and it depends very much on what methods are used to increase production as to whether or not reduced disaster risks will be an associated benefit. Given that development investments intended to increase resilience can sometimes have the opposite effect, putting households at greater risk in the short term, it is essential for resilience programmes to conduct ‘pre-flight’ analysis on their interventions.

Existing information about pastoralist livelihoods needs to be taken into account when devising resilience programmes and policies for pastoralist areas. Of particular relevance are the critical nature of livestock and market hazards; the requirement for long herd-recovery periods after droughts; shared vulnerability among all wealth groups and the redistributive effects of pastoralist economies.

1 Save the Children and the Food Economy Group (2013). Livelihoods at the limit. Reducing the risk of adapting to climate change. Evidence from the consolidated Household Economy Analysis Database.
Suspected outbreak of riboflavin deficiency among populations reliant on food assistance in Uganda

Summary of published research

Location: Uganda

What we know: Riboflavin deficiency (characterised by angular stomatitis) has been reported in emergency affected populations; documented investigations are limited.

What this article adds: A suspected outbreak of riboflavin deficiency in Karamoja Region of Uganda was investigated in a food assisted, crisis affected population in 2009. Angular stomatitis was observed in 0.2% of the 179,172 screened individuals; lower than expected. Biochemical deficiency was confirmed in 86.8% of a small convenience sample of symptomatic and non-symptomatic cases. Food ration content and distribution targets fell short: 55% of distributions provided less than half of the RDA for riboflavin, 17% of distributions provided less than 30% energy (1032 kcal) (target 70%) and average time between distributions was 56.9 days (target 30 days). The findings confirm that micronutrient deficiencies persist amongst emergency affected populations. Improvements in monitoring and surveillance, food ration content and delivery are needed as part of assistance.

The Karamoja Region of Uganda is a semi-arid area where the majority of the population subsists through agro-pastoral or pastoral livelihoods. In 2009, humanitarian assistance in the form of a general food distribution was initiated in response to a multi-factorial acute food security and livelihoods crisis. During an immunisation campaign in mid-August 2009, health workers in Karamoja (Lorengedwat Subcounty, Nakapiripirit District), reported a concern about an increase in mouth sores and gum ulcerations among children in one village; additional cases were identified in surrounding villages. A diagnosis of angular stomatitis (AS) was posited, characterised by bilateral thinning or fissuring of the mouth angles, cheliosis and glossitis, and most commonly attributed to riboflavin deficiency; functional consequences include a decrease in iron absorption and utilisation and attention span and motor skills deficits. Few formal investigations of AS and riboflavin deficiency have been conducted.

In response to the suspected outbreak, health officials and UNICEF initiated an investigation in Karamoja to determine the extent of AS and risk factors for possible riboflavin deficiency. A published study summarised here focuses on activities in Nakapiripirit District and describes the investigation, lessons learned, and guidance for monitoring micronutrient deficiencies among populations receiving food assistance.

Investigation and response

The investigation occurred between September 2009 and February 2010. Multiple methods were used, including a rapid assessment in Lorengedwat sub-county (September 2009), a mass screening throughout Nakapiripirit District (end September- November 2009), a convenience sample collection of blood specimens in two sub-counties of the District (November 2009), and food ration analysis for a district adjacent to Nakapiripirit District (January-February 2010).

Rapid assessment

On September 4, 2009, health workers conducted a rapid assessment in Lorengedwat sub-county to identify cases of AS and assess potential associations with other factors, including diet. A team comprised of local aid agency and government partners visited health facilities in five villages and observed 130 cases with active mouth sores or gum ulcerations among all people at the health facilities visited. The team informedly spoke to a convenience sample of Lorengedwat residents (men, women youth, elderly, opinion leaders) and learned that households were experiencing diminished food access and availability. Residents reported subsisting largely on maize mash and beans during the week prior to the screening day, and children and adults commonly consumed residue from locally brewed maize or sorghum beer (kwete). Local seasonal foods, such as wild leaves and pumpkins, were unavailable due to the drought. Furthermore, some households reported limited access to food due to disruptions in the distribution of the World Food Programme (WFP) general rations. While milk access had declined during recent years, no abrupt reduction occurred prior to the appearance of AS.

Preventive action

Within two weeks of the rapid assessment, UNICEF procured a stock of vitamin B complex and micronutrient tablets for treatment and prevention of the suspected riboflavin deficiency. Considering the lack of diversity of the diet and limited micronutrient-rich foods consumed by people in Lorengedwat sub-county, health staff distributed to children and adults a preventive dose of INТАPLEX vitamin B complex tablets (two tablets per day for 30 days). To pregnant and lactating women in the community, staff distributed micronutrient tablets (one tablet per day for 30 days).

Screening

To determine the extent of the problem, after distribution of vitamin B complex and micronutrient tablets, the following screening was undertaking:

- Staff and Village Health Teams (VHTs) from the Lorengedwat Health Centre (operating at the sub-county level) conducted a house-to-house mass screening (including all individuals) for AS cases in September/October 2009. Trained by UNICEF and Concern Worldwide, screeners identified cases using photo cards generated from rapid assessment findings; cases were defined as individuals with sores in the corners of the mouth, lips, and/or gums. In addition to recording signs of AS, the team also documented sex, age, sub-county, and pregnancy and/or lactation status (when applicable) for all screened individuals. Fifty one percent of the projected population, 4,579 children and adults, were screened.
- Based on the initial findings from Lorengedwat sub-county, mass screening activities were expanded to the remaining sub-counties of Nakapiripirit District during house-to-house polio campaign activities in October/November 2009. The subsequent screening activities were implemented by the district health staff and VHTs. Health facilities were provided with the photo cards to assist with case identification. An estimated 80% of the population (174,593 persons) were screened.

Case management

A total of 399 cases (0.2%) were identified (excluding those identified in rapid assessment): 110 AS cases (2.4%) in Lorengedwat sub-county and 289 cases (0.2%) in the rest of Nakapiripirit District. Nearly half of cases (49.6%) occurred in individuals between 0 and 9 years of age. Approximately half of cases were male. Following UNICEF guidelines, workers treated positive cases with a therapeutic dose of INTAPLEX tablets, the following screening was undertaken:

- Based on the initial findings from Lorengedwat sub-county, mass screening activities were expanded to the remaining sub-counties of Nakapiripirit District during house-to-house polio campaign activities in October/November 2009. The subsequent screening activities were implemented by the district health staff and VHTs. Health facilities were provided with the photo cards to assist with case identification. An estimated 80% of the population (174,593 persons) were screened.

Actine Screening Angular Stomatitis

Sores in the corners of the mouth, lips, gums and tongue can be a sign of lack of vitamins. Make a tally of what you find in your village


2. Other causes of AS include over closure of the mouth (as in people with no teeth), excessive drooling, anaemia, and viral syndromes: sulphate, 2 mg copper, 65 mg selenium, and 150 mg iodine

22
The general food ration for Karamoja and Kotido Regions was set at a 70% ration or 1,470 kcal. The planned ration included maize grain, dried beans, vegetable oil, corn soy blend, and iodised salt and was well balanced for energy, fat, and protein. While the level of micronutrients was well above the RDA for iodine (200%) and vitamin B1 (171%), the levels of vitamin A and vitamin B2 provided by the ration met 57% and 66%, respectively, of the recommended daily amount (RDA) for the general population.

When adjusted for the actual time between distributions, a much different nutritional content was presented. Across the 18 distribution locations, only five of the nine planned distributions were conducted, with one location receiving only four distributions. The cycle (number of days between the distributions) varied greatly, ranging from 17 to 122 days, with an average length of 56.9 days (versus the planned 30 days). The average total energy across all distributions to the 18 locations was 1,032 kilocalories or 49% of the total energy requirement and 70% of the planned ration. Four percent of distributions between April and December 2009 achieved a 70% or higher energy content of the planned ration. Seventeen percent of distributions provided less than 30% of energy requirements. Regarding riboflavin, the range of mean riboflavin content was 0.23 to 1.6 mg per day (RDA=1.4 mg), and 55% of distributions provided less than half of the RDA of riboflavin.

Evidence from these findings was insufficient to confirm an actual outbreak of riboflavin deficiency. However, this investigation provides documentation that micro- nutrient deficiencies can persist among populations in emergency settings, placing them at further risk of morbidity. Ongoing nutrition monitoring and surveillance should be conducted regularly among populations receiving food assistance, and health personnel working with such populations should be sensitised and trained on micronutrient deficiencies. When a suspected micro- nutrient deficiency outbreak is detected, monitoring and surveillance should be enhanced. Preventing outbreaks of micronutrient deficiency through dietary measures should be continued through advocacy to consume locally-available, nutritious foods and to improve the adequacy of food rations delivered.

1 Tablet content: 1 mg vitamin B1, 1 mg vitamin B2, and 15 mg vitamin B3
2 Tablet content: 1.4 mg vitamin B1, 1.4 mg vitamin B2, 1.4 mg vitamin B3, 1.9 mg vitamin B6, 2.6 mg vitamin B12, 800 RE vitamin E, 10 mg vitamin B12, 400 mg folic acid, 70 mg vitamin C, 60 mg inositol fumarate or inositol sulphate, 15 mg zinc sulphate, 2 mg copper, 65 mg selenium, and 150 mg iodine
3 Ugandan Bureau of Statistics
4 Therapeutic dose: tablet content as previously described; six months to ten years of age: seven tablets per day divided into two doses for four days; over ten years of age: 15 tablets per day divided into two doses for four days.
5 Prophylactic dose: tablet content as previously described; children and non-pregnant/non-lactating adults: two tablets per day for 30 days or micronutrient tablets to pregnant or lactating women (content as previously described); one tablet per day for 30 days.
6 Based on comprehensive Food Security Vulnerability Analysis published by World Food Programmes, WFP; 2009 that determined that the general population was able to access approximately 30% of their food and nutrient requirements on their own.

Innovation and success in prevention of konzo

By Dr Howard Bradbury

This article was prepared by Dr Howard Bradbury, who is an Emeritus Fellow at the Australian National University. Since the mid-nineties he has been dedicated to researching the effects of poisonous cyanogens in cassava and neurodegenerative diseases such as konzo and TAN that affect the poorer communities of the tropical world. He developed simple kits to measure total cyanide in cassava roots, flour and leaves and urinary thiocyanate, see http://biology.anu.edu.au/hosted_sites/CCDN

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The article reflects the work of the following teams: J.H. Bradbury, J.P. Banea, C. Mandombi, D. Nahimana, L.E. Denton, N. Kuva.

1 EEG, Research School of Biology, Australian National University, Canberra, Australia.
2 Programme National de Nutrition (PRONANUT), Kinshasa, DRC
3 Hôpital Général de Référence, Zone de Santé de Popokabaka, DRC.
Prevention of konzo using the wetting method on cassava flour in the Democratic Republic of Congo (DRC)

Cassava flour, produced by traditional methods of either soaking (retting) peeled roots in water for some days or else by sun drying, still contains unacceptably high amounts of cyanogens. The cyanide content of the flour is greatly reduced by using the wetting method1-3 as follows: Cassava flour is placed in a bowl and the level marked on the inside. Water is added with mixing; the level of the wet flour drops and then increases again until the level comes up to the mark. The wet flour is spread out on a mat in a thin layer and the enzyme present breaks down the cyanide compound producing hydrogen cyanide gas which escapes. Nearly complete removal of cyanogens takes about 2 hours in the sun or 5 hours in the shade.

Konzo is an irreversible paralysis of the legs that occurs mainly in children and young women after childbirth, associated with consumption of high cyanide cassava flour in a protein deficient diet4,5. Kay Kalenge village in Popokabaka Health Zone had 34 cases of konzo. The women were shown how to use the wetting method and used it on their flour. Monthly visits were made to the village to check for new cases of konzo and every four months urine samples from school children were analysed for thiocyanate (which gave a good measure of cyanide intake) and cassava flour samples for cyanide content. No new cases of konzo occurred in Kay Kalenge during the 18 month intervention; the cyanide content of flour fell to less than 10 ppm and urinary thiocyanate levels dropped sharply6. But most of all it guarantees food safety, fufu6. But most of all it guarantees food safety, prevents food poisoning and konzo.

We have now found that cyanogens are virtually completely removed from cassava leaves by following three simple steps as follows: (1) pounding, (2) standing for 2 hours in the sun or 5 hours in the shade and (3) washing three times in water. Using four different cassava cultivars, we found that the mean residual total cyanide content after steps 1, 2 and 3 were 28%, 12% and 1% respectively. The pounded, washed leaves which are free of cyanogens retain their bright green colour and texture. It is hoped that this mild method of removing cyanogens from cassava leaves, may be a useful alternative to boiling pounded leaves in water, which would save on fuel for cooking and much more importantly, would improve the nutritional status of the cassava eating population of tropical Africa.

Removal of poisonous cyanide compounds from cassava leaves at ambient temperature

Cassava leaves are used particularly by the Congolese population of central Africa and in Liberia, Sierra Leone and Guinea and there is moderate use in other tropical African countries. The traditional method of removing cyanogens from cassava leaves is by pounding in a pestle and mortar followed by boiling in water for about 30 minutes6. On boiling, the bright green colour of the leaves becomes dull green and there is considerable loss of vitamins and protein, including S-containing amino acids present in the protein in the leaves. The S-containing amino acids (methionine and cysteine/cystine) are needed for detoxification in the body of poisonous cyanide (CN) which is converted to thiocyanate (SCN) and is removed in the urine.

The importance of animal protein in preventing the occurrence of konzo was shown in three independent konzo outbreaks in Mozambique, Tanzania and the DRC. People of the same ethnic group as those who got konzo, who lived only 5 km away, did not get konzo because in Mozambique they had fish from the sea7-9, in Tanzania they had fish from Lake Victoria10 and in the DRC they had animal protein from the forest11. Thus konzo can be prevented by reduced cyanide intake and/or adequate nutrition, in particular, an adequate supply of S-containing amino acids needed to detoxify ingested cyanide.

For more information, contact: Dr Howard Bradbury, email: howard.bradbury@anu.edu.au

References

Acceptability of peanut-based RUTF to malnourished pregnant and lactating women in Bangladesh

Summary of research

Location: Bangladesh

What we know: Malnutrition prevalence is high among pregnant and lactating women in Bangladesh. Nutrition rehabilitation programmes use peanut-based RUTF in their treatment, however acceptability and tolerance in this population group is poorly researched.

What this article adds: A cross-sectional study was conducted by MSF to assess acceptability and tolerance of peanut RUTF amongst 248 pregnant and lactating women attending two MSF supported primary health care centres in an urban slum in Bangladesh. While the majority appreciated the therapeutic benefits, 22% rejected peanut based RUTF completely and the remaining 78% found it unacceptable (undesirable taste, smell and side effects). Thirty-nine per cent reported side-effects. This explained the MSF programme experiences which had high loss-to-follow-up and non-responder rates. Thirty three per cent found the instructions inconspicuous and 8% could not read them. Ways forward include concerted effort for alternative formulations of RUTF based on local pulses, preferences and awareness of adult palatability needs.

Malnutrition prevalence among pregnant and lactating women (PLW) in Bangladesh is one of the highest in the world1. The Demographic Health Survey in 2007 showed that 30% of women of childbearing age (15–45 years) were undernourished (Body Mass Index (BMI) <18.5).

One of the commonly used Ready to Use Therapeutic Foods (RUTF) in Africa is Plumpy’nut® (PPN; Nutriset, Malaunay, France). Médecins Sans Frontières (MSF) implemented a PPN-based nutrition programme for malnourished PLW in Kamrangirchar slum setting in Dhaka, Bangladesh. During implementation, many women complained of the taste and peanut-associated smell of PPN. The programme also experienced a high loss-to-follow-up rate (25–30%) and a high non-responder rate (32–35%) despite women being on PPN for a period up to five months. A study was therefore conducted to assess acceptability and tolerance of PPN among PLW in Kamrangirchar slum in Bangladesh.

Method

The study involved a cross-sectional survey using a semi-structured questionnaire. It was conducted between May and July 2011 in Kamrangirchar, an urban slum setting in Dhaka, Bangladesh. The slum has an estimated population of 400,000 inhabitants living within an area of 3.1 km². MSF health services in Kamrangirchar were provided through two primary health care (PHC) clinics. The nutrition programme for PPN started in August 2010. The study included all PLW who were either malnourished or at risk of malnutrition, and who had received PPN for at least 4 weeks at the time of the study.

PLW were admitted to the nutrition programme if they were found with severe acute malnutrition (SAM) [mid-upper arm circumference (MUAC) <170 mm or the presence of severe nutritional oedema ≥ grade three] or were at risk of malnutrition (MUAC<210 mm). Based on the measured MUAC threshold, PPN daily dose was prescribed (one to three packs per day) for 2–5 months. Along with the nutritional support, PLW were offered antenatal and postnatal care.

Nutritional follow-up assessments were done monthly within the community. Women who recorded complete rejection of PPN were switched to another RUTF (BP100 – high-energy biscuit bars). Women were discharged from the programme when they attained a MUAC >220 mm, oedema less than grade two and were assessed as being of good clinical status for at least two consecutive visits. PLW who did not recover after receiving PPN for five months were switched to a multiple micronutrient powder (MNP) supplement.

A semi-structured questionnaire was used to gather socio-demographic information, perceptions of PPN (taste, smell, consistency, colour, side effects), packaging, consumption of PPN (accepted readily, forced to ingest it, rejected completely), general appreciation of PPN and suggestions to improve it. Independent home visits were arranged to conduct the interviews. PPN was considered acceptable if PLW did not perceive problems of undesirable taste, smell, colour, consistency or side effects at any time during the course of intake. Unacceptability was defined if PLW perceived any of the previously mentioned problems, felt that they were being forced to take PPN, or completely rejected PPN after four weeks of intake. The remaining 181 (73%) found PPN unacceptable because of undesirable taste, smell or attributed side effects and stated that they forced themselves to take PPN. Overall, 149 (60%) women found the PPN taste unacceptable while 107 (43%) found the smell unacceptable – more than half complaining of the peanut-based smell. In an attempt to compensate for the unacceptable taste and smell, 133 (54%) mixed PPN with water and seven (3%) mixed it with other food such as chapatti and rice. A total of 97 (39%) women reported at least one side effect attributed to PPN, which included nausea (27%), vomiting (19%), diarrhoea (8%), abdominal distension (4%) and abdominal pain (3%). Most of the reported side effects were higher among pregnant than lactating women. Despite the mentioned limitations in PPN acceptability, 212 (85%) women perceived PPN to be beneficial as a therapeutic product for improving general health.

The majority (99%) of women found PPN package easy to open. Overall, 146 (59%) understood the illustrated instructions on the package, 81 (33%) found the instructions inconspicuous and 21 (8%) said they were illiterate. The majority (79%) felt that the overall PPN acceptability should be improved – 82% of them desired a change in taste and 48% desired a change in smell.

This study shows that despite a perceived therapeutic benefit, eight of every 10 PLW receiving PPN for nutritional rehabilitation in a slum setting in Bangladesh found problems related to RUTF acceptability.

Conclusions

The findings of this study raise a number of important considerations related to PPN acceptability. First, the fact that 60% of women found the taste of this ‘food product’ unacceptable is concerning. A considerable proportion also complained of its peanut-based smell. In Bangladesh, lentils constitute the main ‘pulse’ in the basic daily diet. Although peanuts are available in the local markets and are inexpensive, they are not used routinely as part of a Bangladeshi diet. The use of peanut as a core constituent in PPN needs to be re-examined, as undesirable taste and smell of any RUTF is likely to seriously influence acceptability and adherence, which eventually impact nutritional outcomes. Second, 39% of women attributed side effects to PPN intake, and these were higher among pregnant than lactating women. This issue merits further assessment and research. Third, 41% of women found the illustrations on the package incomprehensible, which highlights the need to find more suitable ways of communicating the ‘instructions for use’ in such communities.

The ideal way forward would be the development of a RUTF that is adapted to adult’s expressed palatability preferences and based on locally available pulses. However, the nutritional contents of such recipes need to be carefully assessed for their potential use for therapeutic rehabilitation in PLW. The authors conclude by urging nutritional agencies and therapeutic food manufacturers to intensify their effort towards developing more RUTF alternatives with improved palatability and smell for adults, and with adequate therapeutic contents for treating malnourished PLW in Bangladesh.

References


A key aspect of the humanitarian reform process has involved developing capacity. The 2005 Humanitarian Response Review noted: “there are simply not enough people with the right experience available quickly”. In response, there has been increased investment in training and professional development for existing and future cadres of humanitarian staff. A recognised set of standards for humanitarian staff would arguably improve performance and promote quality and accountability. The result has been the development of a number of competency frameworks, which are increasingly being used to measure ability and to structure training.

Despite serious gaps in national and international capacity on nutrition, no nutrition competency framework has been developed to describe the skills required for emergency nutrition preparedness, response and recovery. The Nutrition in Emergencies Regional Training Initiative (NIERTN), which aims to provide sustainable, high-quality training in nutrition in emergencies (NIE), highlighted the need for a more detailed examination of the role of emergency nutritionists and the skills required. A recently published paper documents the process of developing a proposed technical competency framework for NIE and discusses some of the potential opportunities and challenges to its implementation as a tool to strengthen human resource capacity.

Key features

The key features of a competency framework were identified from the review of existing frameworks and, using these as a guide, the NIE competencies identified were categorised as either core or technical.

Core professional competencies are regarded as those that are needed to function effectively in a work environment and include behaviours such as the ability to communicate and work effectively with others, while core humanitarian competencies include behaviours that are required for humanitarian work, such as the application of humanitarian principles. Competencies that already feature in the existing core humanitarian frameworks were removed to avoid duplication. The competencies were then assigned to a technical domain and where necessary, re-formulated into a behavioural indicator. Expressing competencies in the form of behaviour facilitates the use of a framework as a tool for assessing ability and performance. Each behavioural indicator was then allocated to one of three levels, corresponding to progressive seniority within the sector. This allocation was done using NIE job specifications for posts requiring varying levels of professional experience.

Process

The identification of NIE competencies was comprehensive and consisted of four stages. First, existing competency frameworks, course curricula and emergency nutrition job specifications were reviewed and relevant competencies extracted. Frameworks, courses and job specifications were included only if they featured an aspect of emergency nutrition. Second, semi-structured interviews were conducted with a convenience sample of ‘field experts’ working for humanitarian organisations. Third, participants from NIE courses held in Uganda, Thailand and Lebanon in 2010 and 2011 were contacted to identify which skills they felt were essential for their roles in emergency nutrition. Finally, the compiled list of competencies was reviewed by members of the Capacity Development Working Group of the Global Nutrition Cluster (GNCDWG) during the second half of 2011.

Framework structure

Six humanitarian competency frameworks were identified and reviewed which led to the proposed structure for the NIE framework shown in Table 1. A total of fifty-six NIE job specifications were identified with roles ranging from graduate entry level to those requiring over 10 years’ experience. Job titles included nutrition advisers, coordinators, programme managers and chiefs of health and nutrition. The hiring organisation consisted of international humanitarian non-governmental organisations (NGO) and United Nations (UN) agencies, with thirty-six and twenty job specifications, respectively.

The full competency framework contains twenty competency areas with 161 behavioural indicators categorised into three levels. The competencies identified as essential for any individual working within NIE are diverse, encompassing common core competencies, such as communication and teamwork; humanitarian competencies essential to all humanitarian workers, such as knowledge and application of humanitarian system and standards; and nutrition specific technical areas, such as identification of micronutrient deficiencies. This leads to a layered approach to building a competency framework, which is based on the Child Protection in Emergencies (CPIE) framework (Save the Children 2010) and shown in Figure 1.

The framework has since been adopted for preliminary use by Concern Worldwide, World Vision, Valid International and International Medical Corps.

Table 1: Proposed structure for NIE competency framework

<table>
<thead>
<tr>
<th>Competency domain</th>
<th>Level 1 behaviour</th>
<th>Level 2 behaviour</th>
<th>Level 3 behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive name</td>
<td>Required for field-level workers</td>
<td>Required for team co-ordinators/supervisors</td>
<td>Required for country and international level technical staff</td>
</tr>
</tbody>
</table>

Figure 1: The layered approach to building core professional, core humanitarian and technical competencies for NIE


2. Competencies are defined as the behaviours and technical attributes that individuals must have, or acquire, to perform effectively in a particular role.
The 2011 famine in Somalia: lessons learnt from a failed response

Summary of published research

Location: Somalia

What we know: In July 2011, a famine was declared in Southern Somalia despite sufficient, timely and robust early warnings. Around 258,000 people died. Multiple causes are recognised including drought, conflict, anti-terrorism legislation limiting aid, increased global food prices and chronic structural factors.

What this article adds: This analysis shows that the humanitarian system failed to prevent famine as five conditions for timely response - presence, access, adequate funding, operational capacity and legal protection for humanitarian action - were not met. The political agendas of donor governments, regional powers, and the warring authorities within Somalia were incompatible with the prevention of famine and hindered the ability of the UN-led cluster system to operate independently and effectively. Significant reforms to prevent this happening again rely on depoliticised aid, such as transparent and pooled funding mechanisms that are based on pre-defined criteria, quickly accessible to operational agencies and protected from political influence.

On 20 July 2011, in the wake of 11 months of escalating warnings, the United Nations (UN) declared famine in two regions of South Central Somalia. Further declarations followed in four more areas over the course of the next two months. The famine is thought to have cost the lives of 258,000 people, while hundreds of thousands more fled across the border into Kenya and Ethiopia.

Although the media focused on drought as the main cause, the 2011 Somalia famine was caused by multiple factors that included conflict, the use of anti-terrorism legislation by the US government to prevent aid reaching Southern Somalia, an increase in global food prices and other long-standing, structural factors. Early warnings of the impending health catastrophe were sufficient, timely, and robust. However, timely action and an effective response from national authorities and the international humanitarian system were lacking.

Various reasons for this inappropriate use of early warning information by donors and decision makers have been discussed, including their problems in dealing with the uncertainty inherent in probabilistic analysis and the absence of definitive statements about future mortality. Other factors included a lack of advocacy activity to highlight the impending crisis and the complex political environment surrounding the conflict. Had there been a more effective response to early warning, then preventive interventions could have been undertaken to minimise excess mortality and morbidity.

A recently published article explores why early warnings were ignored and what reforms to the humanitarian system are required to help prevent a recurrence of famine in Somalia or elsewhere. The authors posit that five conditions need to be in place for a timely response to early warnings by humanitarian agencies. These are: presence, access, adequate funding, operational capacity and legal protection for humanitarian action. The article considers each in the run up to the 2011 Somalia famine.

Presence

In the case of Somalia, key humanitarian actors were missing. The World Food Programme (WFP) is the UN agency primarily responsible for the provision of food assistance and the co-leader of the ‘Food Security Cluster’ in Somalia. As such, it is the UN ‘provider of last resort’ with an obligation to do everything it can to “ensure an adequate and appropriate response”. However, WFP had withdrawn from South Central Somalia in January 2010. Already suffering repeated attacks on its staff, WFP’s presence became untenable when a 2009 UN

Research

mum standards rather than the best that is possible. Despite these limitations, competency-based learning is now dominant at most stages of medical training in high-income countries.

Those with a lack of formal academic qualifications, such as a relevant BSc, MSc or professional training certificate, are not necessarily excluded in this process as the essence of a competency-based approach is that individuals are assessed on skills and attributes that may have been gained through experience or personal development.

The framework can also be used to standardise training courses, by relating the indicators to learning objectives. Competency-based training naturally leads on to competency-based assessment methods. In the medical sector, assessing technical and behavioural competences through observation of simulated situations is a valid approach. This approach facilitates the assessment of a person’s behaviours, such as decision-making capacity, in addition to technical competencies.

Staff can use the framework as a self-assessment tool, grading themselves for each competency and identifying areas which would benefit from further development. The competency areas in which they score lower or areas which they would like to develop, can then be focused upon, with the behavioural indicators providing clear examples of what is required to attain each level.

When comparing the competencies identified in the framework, there is a clear difference between what was identified as essential from job specifications and interviews and what is currently being taught in the NIE academic and training courses. While the majority of the technical skills are covered, many general core competencies are sorely neglected and were noted as limiting effectiveness in the field.

Many of the required competencies are not specific to emergency nutrition but overlap with disaster preparedness, recovery and long-term development work, e.g. data collection and surveys is a competency area required by both emergency and non-emergency nutritionists. There is also strong overlap with other humanitarian sectors such as food security and logistics. While there is need to strengthen nutrition capacity in both development and emergency contexts and development nutritionists inevitably respond in chronic emergencies, a separate competency framework for NIE is warranted given the unique set of skills, knowledge and behaviour needed.

In addition, the mechanisms by which staff are recruited, assessed and supported usually differ between the development and emergency sectors.

The move to a competency-based approach is a logical step to strengthen the NIE sector and build human resource capacity. However, it is essential that indicators for monitoring and evaluating the use of competency frameworks are defined in order to build an evidence base on their use not just within NIE, but within the humanitarian sector as a whole.
monitoring exercise released preliminary information about significant food aid diversions, including to al Shabaab and other armed opposition groups. These findings attracted a good deal of attention from US officials and the media. The implementation of US legislation (discussed below) and associated pressures were other important factors that may have contributed to the decision by WFP to withdraw.

Access

In Somalia, humanitarian access has been challenged for decades. Humanitarian aid has formed a critical part of the economy and political power has been built upon it and used to control access to it. In South Central Somalia, access was denied to a number of key agencies by al Shabaab. Shortly after WFP had suspended operations in the region in 2010, the agency was accused of political motives and banned, making it impossible for it to return as famine approached. A further 16 UN agencies and international NGOs were later banned for “illicit activities and misconduct” during November 2011, while the famine was on-going. Nonetheless, operational agencies such as Médecins Sans Frontières, Save the Children, Action Against Hunger, Islamic Relief and the International Committee of the Red Cross continued to enjoy access permissions in al Shabaab administered areas, albeit with certain restrictions, before and during the famine. Importantly, these agencies operated largely outside of the UN-led cluster system.

Operational capacity

Without doubt, Somalia presents a very challenging operating environment and most agencies struggle to maintain adequate human resource and material capabilities to meet the high level of need. During 2011, it was particularly difficult to maintain or build adequate operational capacity in South Central Somalia or to control or monitor the quality of relief programmes. Due to insecurity, even agencies that had access to field sites in Somalia had to rely usually on managing projects remotely from offices in Nairobi.

Adaptation funding

Funding for South Central Somalia declined by half between 2008 and 2011 as the USA withdrew support and imposed highly stringent reporting restrictions as part of efforts to prevent the use of aid by al Shabaab. The EU also scaled back funding to the UN’s Humanitarian Office, to the extent that some member states were accused of “wilful neglect” as famine struck. Arguably due to the slow response of western donors, several new stakeholders did enter the donor pool for Somalia during 2011. These included Saudi Arabia, Brazil, Turkey, the Organisation for Islamic Cooperation and China. But their contributions, although substantial, were not adequate to address the shortfall.

Legal protection

Fear of litigation by governments reduced the speed and extent of responses that could have prevented the development of famine. In particular, sanctions imposed by the US Office of Foreign Assets Control and extensions to the criminal code made under the PATRIOT Act, introduced wide-ranging sanctions imposed by the US Office of Foreign Sanctions. The political context

The humanitarian system failed to prevent famine in South Central Somalia in 2011, not because of a lack in early warning, but rather because the five requirements outlined above were not met. The reasons explaining why famine struck, however, the authors argue that politics was a key factor.

The strategy of western donors in Somalia was primarily shaped by the global war on terror, the priority being to undermine al Shabaab, the de facto administration in the worst-affected areas. Inadequate funding was a direct and inevitable consequence of donor anti-terror legislation. So was the failure to provide an enabling legal environment for humanitarian agencies to operate without the threat of prosecution. This strategy also had serious consequences for the presence, operational capacity and access of agencies on the ground. Donor concerns about the diversion of food aid to al Shabaab almost certainly contributed to WFP’s decision to withdraw following the critical UN monitoring report. Association with western donors made it dangerous for agencies to maintain operational capacity in al Shabaab controlled areas and made al Shabaab’s decision to control areas and make al Shabaab’s decision to maintain operational capacity in al Shabaab controlled areas and made al Shabaab’s decision to ban WFP and 16 other UN agencies and international NGOs more likely.

The prevention of famine was not of primary concern to the international community. In addition to the decision to limit humanitarian access as part of its propaganda campaign against the West, reports indicate that al Shabaab also placed restrictions on the movement of people attempting to flee affected areas, and extracted agricultural taxes likely to have exacerbated food insecurity. A camps management campaign against the Transitional Federal Government (TFG) and its regional and western allies was the overriding priority.

The objectives of regional powers within Somalia are complex and not purely humanitarian. For example, there are advantages to Kenya and Ethiopia in being allies of the West in the global war on terror, most obviously in terms of aid receipts. In addition, military operations in Somalia may help achieve wider economic objectives associated with the development of the Lamu corridor (also known as LAPSET), an ambitious project which includes running an oil pipeline from Lamu on the coast of Kenya through to the fields of the Lamu gas concessions. Infrastructure and tourism development will also benefit Ethiopia. In addition, there are significant gas reserves in the Lamu basin, which lies just south of the Kenyan/Somali border. All of these offer substantial opportunities for developing the economies of East Africa. However, the infrastructure development also requires security and a pacified Somalia, as land based incursions into the North Eastern Province of Kenya would threaten the development of the pipeline, whilst marine raids could jeopardise both the development of the gas concessions and the later export of oil and gas from Lamu, only 60 miles from the border. From this standpoint, the military operations of regional powers within Somalia, particularly those of Kenya, can be more easily understood.

International attempts to blockade al Shabaab-held territories were a strategy to weaken al Shabaab, but made famine in these areas more likely. The primary objective of an incursion by Kenyan troops in the famine was not to respond to the kidnapping of western tourists as originally claimed, but probably to annex the land west of the Juba river in order to create an effective buffer territory (Jubaland).

Once famine was declared, humanitarian agencies operating in this highly complex and politicised environment responded rapidly. However until then, agencies had collectively failed to raise the alarm or increase their consolidated appeal, on the basis that it was politically unrealis- tic to do so given donor policies towards Somalia. Agencies also failed to collectively adapt to WFP’s absence from South Central Somalia; contingency plans were not developed despite the collapse in presence and operational capacity that this represented. WFP remained the provider of last resort despite its questionable ability to perform this role while operationally absent from the areas most at risk. Whilst al Shabaab’s claim that the agencies it banned were pursuing ‘illicit activities’ was probably nonsense, its underlying concern that they were linked to or somehow supported the UN was not. Agencies working through the cluster system could never hope to be perceived as neutral. The cluster system was led by the UN, which in Somalia had a dual humanitarian and political mandate. It was heavily dependent upon western donors for its funding and had links both to the UN-mandated AMISOM force fighting al Shabaab, and the TFG. It is no surprise that those agencies operating largely outside of the cluster system maintained the greatest access.

Whilst the facts that fully explain who did what and why may never come to light, prima facie it appears that the 2011 famine followed from multiple acts of political motivations, primarily by donors and commissions. For whatever reason, the UN and its member states were accused of “wilful neglect” as famine struck. Arguably due to the slow response of western donors, several new stakeholders did enter the donor pool for Somalia during 2011. These included Saudi Arabia, Brazil, Turkey, the Organisation for Islamic Cooperation and China. But their contributions, although substantial, were not adequate to address the shortfall.

Legal protection

Fear of litigation by governments reduced the speed and extent of responses that could have prevented the development of famine. In particular, sanctions imposed by the US Office of Foreign Assets Control and extensions to the criminal code made under the PATRIOT Act, introduced wide

...
Comparison of LQAS and 30-by-30 two-stage cluster sampled survey method for the assessment of coverage indicators

By Asrat Dibaba, Charles Chimombo, Ari Uotila, Whitney King and Mark Myatt

Location: Malawi

What we know: The 30-by-30 two-stage cluster survey is commonly used for programme monitoring and evaluation. It takes time, resources and expert supervision and support. The Lot Quality Assurance Sampling (LQAS) technique has been used in different contexts and settings for measuring programme performance.

What this article adds: A 30-by-30 two-stage cluster sampled survey was prospectively compared with an LQAS survey (19 observations in five supervision areas) in the same World Vision programme area in Malawi. Both methods provided wide-area estimates with useful precision. As expected, the LQAS survey confidence intervals were wider than the 30-by-30. However, the two surveys returned very similar estimates for eight out of nine indicators. The LQAS survey method was significantly cheaper than the 30-by-30 cluster survey (31% of data collection, data entry and travel costs).

Introduction

In World Vision’s development programmes, the 30-by-30 two-stage cluster sampled design is the standard survey method used for monitoring and evaluation assessments and is used in many countries where World Vision is operational. The 30-by-30 cluster method is often perceived as being complex, expensive and time consuming by field programme staff. Most field surveys employing this survey method are supervised and analysed by external consultants. This tends to limit ownership of the process, data, or results by local programme staff and community. Programming at the ground level could be improved if programme staff had access to quick, inexpensive and simple information about key programme indicators. This information could then be used in timely monitoring and management of programmatic interventions. In this article, the potential of the Lot Quality Assurance Sampling (LQAS) technique to provide inexpensive and programmatically useful information at the community level is explored and compared with the 30-by-30 two-stage cluster sampling technique.

The LQAS survey method used in the work described here employs a stratified sampling design in which small samples, randomly selected from each of several supervision areas (SAs), are used to classify coverage or prevalence in each supervision area as either acceptable or unacceptable based upon a simple count of the number of sampling units with (or without) the characteristic of interest. The data collected from the strata may be combined and a wide-area estimate calculated. When this is done, the LQAS method provides both a wide-area estimate and small-area classifications.

The LQAS survey method can provide an alternative to traditional cluster sampled surveys. For example, LQAS designs have been shown to provide a statistically rigorous alternative to the more time-consuming and expensive SMART survey method (also a two-stage cluster-sampled design) that is commonly used to assess the prevalence of acute malnutrition. The SQUEAC and SLEAC coverage assessment methods use LQAS to test hypotheses about programme coverage, to classify programme coverage at the level of the service delivery unit, and to estimate coverage over wide areas. LQAS designs have been shown to provide comparable wide-area estimates to standard 30-by-7 Expanded Programme on Immunisation (EPI) surveys, as well as providing maps of local classifications of vaccine coverage.

In the work reported here, a 30-by-30 two-stage cluster sampled survey, in which m = 30 observations were collected from each of m = 30 clusters, was compared with a LQAS surveys, in which n = 19 observations were collected from each of m = 5 supervision areas (strata). All surveys were of the same programme area.

Methods

Background

The study was conducted in Chamba Traditional Authority, Machinga district, Malawi where World Vision is implementing an integrated development programme with five project areas (i.e. education, health, nutrition, sponsorship management, and child protection). The programme is in the third year of the first phase of the programme cycle for the nutrition project, which includes early childhood development and emergency response sub-projects. The programme uses both community-based home-visitor and care-group models. The programme area has a population of 10,790

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Table 1: Estimates returned by the different survey methods

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Method</th>
<th>LQAS</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30-by 30</td>
<td>LQAS</td>
<td></td>
</tr>
<tr>
<td>1 Safe source of water (dry season)</td>
<td>88.3%</td>
<td>87.9%</td>
<td>0.9102</td>
</tr>
<tr>
<td>2 Safe source of water (wet seasons)</td>
<td>90.1%</td>
<td>89.3%</td>
<td>0.8098</td>
</tr>
<tr>
<td>3 Proportion of children aged 12-23 months who have received Penta-3 vaccine</td>
<td>95.7%</td>
<td>95.7%</td>
<td>0.9197</td>
</tr>
<tr>
<td>4 Proportion of children aged 12-23 months who are immunized against measles</td>
<td>97.3%</td>
<td>94.0%</td>
<td>0.6734</td>
</tr>
<tr>
<td>5 Proportion of children aged 6-18 years who are currently enrolled in and attending a structured learning institution</td>
<td>91.2%</td>
<td>95.5%</td>
<td>0.4124</td>
</tr>
<tr>
<td>6 Proportion of respondents who believe that child sponsorship is only for sponsored children and has nothing to do with non-sponsored children</td>
<td>65.7%</td>
<td>62.6%</td>
<td>0.0285</td>
</tr>
<tr>
<td>7 Proportion of respondents who believe that World Vision should spend more money on families who are registered in the child sponsorship program rather than on community development projects</td>
<td>60.0%</td>
<td>55.8%</td>
<td>0.4251</td>
</tr>
<tr>
<td>8 Proportion of respondents who believe that child sponsorship unites rather than divides the community</td>
<td>89.0%</td>
<td>84.2%</td>
<td>0.2147</td>
</tr>
<tr>
<td>9 Proportion of respondents who believe that child sponsorship helps in the development of their communities</td>
<td>89.6%</td>
<td>83.5%</td>
<td>0.3906</td>
</tr>
</tbody>
</table>

* p-value for a Wald type test with a null hypothesis of no difference between estimates returned by the two survey methods.

Table 2: LQAS classification for each supervision area

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Attribute</th>
<th>Supervision Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Safe source of water (dry season)</td>
<td>Triage levels*</td>
<td>60% / 90%</td>
</tr>
<tr>
<td></td>
<td>Successes</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Decision rule**</td>
<td>Number of successes ≥ 15</td>
</tr>
<tr>
<td>Safe source of water (wet seasons)</td>
<td>Triage levels*</td>
<td>60% / 90%</td>
</tr>
<tr>
<td></td>
<td>Successes</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Decision rule**</td>
<td>Number of successes ≥ 15</td>
</tr>
<tr>
<td>Proportion of children aged 12-23 months who have received Penta-3 vaccine</td>
<td>Triage levels*</td>
<td>65% / 95%</td>
</tr>
<tr>
<td></td>
<td>Successes</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Decision rule**</td>
<td>Number of successes ≥ 16</td>
</tr>
<tr>
<td>Proportion of children aged 12-23 months who are immunized against measles</td>
<td>Triage levels*</td>
<td>65% / 95%</td>
</tr>
<tr>
<td></td>
<td>Successes</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Decision rule**</td>
<td>Number of successes ≥ 16</td>
</tr>
<tr>
<td>Proportion of children aged 6-18 years who are currently enrolled in and attending a structured learning institution</td>
<td>Triage levels*</td>
<td>65% / 95%</td>
</tr>
<tr>
<td></td>
<td>Successes</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Decision rule**</td>
<td>Number of successes ≥ 16</td>
</tr>
<tr>
<td>Proportion of respondents who believe that child sponsorship is only for sponsored children and has nothing to do with non-sponsored children</td>
<td>Triage levels*</td>
<td>30% / 60%</td>
</tr>
<tr>
<td></td>
<td>Successes</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Decision rule**</td>
<td>Number of successes ≥ 9</td>
</tr>
<tr>
<td>Proportion of respondents who believe that World Vision should spend more money on families who are registered in the child sponsorship program rather than on community development projects</td>
<td>Triage levels*</td>
<td>25% / 55%</td>
</tr>
<tr>
<td></td>
<td>Successes</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Decision rule**</td>
<td>Number of successes ≥ 8</td>
</tr>
<tr>
<td>Proportion of respondents who believe that child sponsorship unites rather than divides the community</td>
<td>Triage levels*</td>
<td>55% / 85%</td>
</tr>
<tr>
<td></td>
<td>Successes</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Decision rule**</td>
<td>Number of successes ≥ 14</td>
</tr>
<tr>
<td>Proportion of respondents who believe that child sponsorship helps in the development of their communities</td>
<td>Triage levels*</td>
<td>65% / 95%</td>
</tr>
<tr>
<td></td>
<td>Successes</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Decision rule**</td>
<td>Number of successes ≥ 16</td>
</tr>
</tbody>
</table>

* Triage levels are the upper threshold of the indicator level considered to be "poor" and the lower threshold of the indicator level to be considered OK. Triage levels of "60% / 90%" define "poor" as below 60% and "OK" as above 90%. Indicator levels between the triage levels are classified as either "poor" or "OK" with a probability that depends upon the proximity of the indicator level to the triage levels. The figures in brackets refer to classification errors. Provider Probability of Error (PFE) is the risk that the survey will return a "poor" classification when the true classification is "OK". A provider error may lead you to divert resources to a supervision area that does not need them. Consumer Probability of Error (COPE) is the risk that the survey will return an "OK" classification when the true classification is "poor". A consumer error will leave poorly performing supervision areas undetected. Both CFE and PFE were set at ≤ 10% for all indicators.

** The LQAS decision rule that matches the triage levels and error levels with a sample size of n = 19. When more than one decision rule met the triage / error criteria the decision rule with the lowest CFE was used.

Table 3: Cost comparison of the two survey methods

<table>
<thead>
<tr>
<th>Activity</th>
<th>Survey Method</th>
<th>LQAS</th>
<th>30-by-30</th>
<th>Ratio (LQAS:30-by-30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data collection</td>
<td>Per sample</td>
<td>32 minutes</td>
<td>20 minutes</td>
<td>160%*</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>173 person-hours</td>
<td>116 person-hours</td>
<td>32%**</td>
</tr>
<tr>
<td>Data entry</td>
<td>3 person days</td>
<td>25 person days</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>345 km</td>
<td>101 km</td>
<td>34%***</td>
</tr>
</tbody>
</table>

* These per sample averages are derived from the enumerators’ logs which recorded the time spent in the village required to collect the entire village sample. The result given is the time spent in the village divided by the number of samples taken from the village. Problems with the completeness of enumerators’ logs means that the cited per sample average is based on incomplete data. 60% / 77% from a possible 900 of the 30-by-30 sample and 73% / 78% of a possible 95 of the LQAS sample were used. The cited per sample averages are to complete one 30-by-30 sample and one complete set of the three parallel LQAS samples.

** The overall amount of time taken for data collection was calculated from the supervisors’ logs for time spent in the field (the time they left the base until the time they returned to base minus the time spent for lunch).

*** The difference is due to reduction in numbers of return-to-base journeys required to complete the surveys.
people in 2,158 households. Nine indicators (see Table 1) measuring the progress of programme implementation were assessed and results of the two survey methods compared.

Survey procedures
A modified (i.e. the within-cluster sample size was increased from seven to thirty) version of the World Health Organisation (WHO) EPI methodology, was used for the 30-by-30 cluster survey. Thirty primary sampling units (clusters) were selected from a list of all villages in the programme area. Enumerators were randomly assigned to each cluster using the standard EPI proximity sampling method11,12. Thirty households were selected from each cluster using the standard EPI proximity sampling method11,12. The first household was selected by randomly choosing a direction (i.e. by spinning a bottle) at a central location in the village and counting the households in that direction from the centre to the edge of the village. The first household was selected at random from households along the selected direction. Interviewers proceeded to the nearest household until the within-cluster sample size (n = 30) was met. At total sample size of n = 900 was collected.

The LQAS surveys covered the same programme area as the 30-by-30 surveys. The programme area was divided into five contiguous and non-overlapping areas. The programme area covered three administrative divisions of Chamba district. The two largest administrative divisions were divided into two approximately equal areas yielding five supervision areas from three administrative divisions (see Map 1). The village locations from which respondents would be randomly selected were identified from each of the five supervision areas using the same list of villages and PPS. With this, the number of households per village selected for this exercise ranged from one household up to nine. A total of 95 households for each target population of interest in the survey were selected from the entire survey area. Each household was selected from the villages using the random selection method used to find the first household in the 30-by-30 cluster survey. A total sample size of n = 95 was collected.

Three parallel LQAS surveys were conducted among different target groups. One survey of children aged between six and eighteen years assessed education-related indicators. A second survey assessed immunisation coverage in children aged between twelve and twenty-three months, enumerators were asked to complete logs that captured both travel time and the time needed for conducting interviews. These logs were used by researchers to determine the number of person-hours required to complete 30-by-30 and LQAS surveys.

Statistical analysis
Data were entered, checked cleaned and analysed using SPSS and Microsoft Excel. For data from the 30-by-30, survey estimates of indicator levels and associated 95% confidence intervals were calculated for the entire programme area using SPSS Complex Samples. The use of a proximity sample in the second stage of the 30-by-30 survey meant that accurate and reliable cluster-level classifications could not be made. For LQAS data, estimates of indicator levels were calculated for the entire programme area by taking into account populations of the supervision areas using the direct adjustment method. Estimates from the two survey methods were compared using a Wald type test statistic:

$$\chi^2 = \frac{(\hat{a} - \hat{d})^2}{\text{var}(\hat{a} - \hat{d})}$$

The variance of the difference between the two estimates was calculated using the survey estimates and their associated 95% confidence limits. This approach was used as it accounts for design effects in the two surveys.

Programme performance in each supervision area was classified as adequate or poor for three indicators using LQAS decision rules created using tables commonly used for international development programmes with both consumer error and provider error fixed at less than 10%.

Daily time logs completed by the enumerators were examined to assess the feasibility of the two survey methods. Data entry clerks were assigned to either enter 30-by-30 survey or LQAS survey data and person-days were determined based on the time assigned and the completed workloads. Drivers also completed travel logs tracking the distances covered in transporting enumerators to and from the villages where data were collected. Finally, the number of pages printed for each set of surveys was determined and a set price per page was used to estimate the cost of printing.

Results
Comparisons of the estimates of indicator levels found in the two surveys are shown in Table 1. The two surveys returned very similar estimates for eight out of nine indicators. The confidence intervals from the LQAS survey were wider than those from the 30-by-30 survey. This was expected as the sample sizes differed by almost an order of magnitude. Programme performance classifications for the nine indicators are shown in Table 2 (results are also shown in Map 1). Cost comparison data are shown in Table 3. The overall cost of the LQAS survey was about a third of the cost of the 30-by-30 cluster survey. While the time spent to complete one sample was 60% more (32 minutes versus 20 minutes) in the LQAS approach, the overall time spent in the LQAS survey was 173 person-hours compared to 540 person-hours with the 30-by-30 cluster survey.

Discussion
In this study, there was no statistically significant difference between the estimates returned by the two survey methods except for one indicator. This indicator was a knowledge-attitude-practice (KAP) type question and such questions are often unreliable and sensitive to the approach of the interviewer. This statistically significant difference was not, however, a functionally significant difference in the sense that both results were below a level deemed by programme managers to be acceptable.

The LQAS survey method is capable of providing more information than the 30-by-30 method. Both methods provided wide-area estimates with useful precision (see Table 1). The LQAS survey method also provided small-area classifications and, in the study reported here, identified a supervision area that was failing to achieve adequate coverage on three indicators (see Table 2 and Map 1). The LQAS survey method was also found to be significantly cheaper than the 30-by-30 survey method.

Conclusions
In this study the LQAS survey method was found to provide more information at lower cost than the 30-by-30 survey method. Programme managers should seriously consider using the LQAS survey method for monitoring and evaluation purposes.

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Update of UNICEF/WHO/World Bank database on child malnutrition

Summary of research

Location: Global

What we know: A joint database on child malnutrition is maintained by UNICEF, WHO and the World Bank. To date this has not included wasting estimates.

What this article adds: The UNICEF/WHO/World Bank database has been updated. It includes global and regional estimates of wasting and severe wasting. Globally in 2012, amongst children under five years, 162 million were stunted, 99 million were underweight, 51 million were wasted, 17 million were severely wasted and 44 million were overweight. Between 2000 and 2012, the prevalence of stunting, underweight, wasting and severe wasting fell while overweight increased. There is a higher proportion of child stunting, underweight, wasting or severe wasting in Asia.

On September 20, 2013, UNICEF, the World Health Organisation (WHO) and the World Bank (WB) updated their joint database on child malnutrition and released new global and regional estimates for 2012. For the first time, the database contains global and regional estimates of wasting and severe wasting. A recently published note summarises the main findings, introduces accompanying interactive data dashboards, and highlights pertinent methodological notes.

Main findings

Stunting
- Globally, 162 million under-five year olds were stunted in 2012.
- The global trend in stunting prevalence and burden continues to decrease. Between 2000 and 2012 stunting prevalence declined from 33% to 25% and the burden declined from 197 million to 162 million.
- In 2012, 56% of all stunted children lived in Asia and 36% in Africa.

Underweight
- Globally, 99 million under-five year olds were underweight in 2012.
- The global trend in underweight prevalence continues to decrease, but at a slow pace.
- Between 1990 and 2012, underweight prevalence decreased from 25% to 15%, which remains insufficient to meet the Millennium Development Goal of halving the 1990 prevalence by 2015.
- In 2012, 67% of all underweight children lived in Asia and 29% in Africa.

Wasting and severe wasting
- Globally, 51 million under-five year olds were wasted and 17 million were severely wasted in 2012.
- Globally, wasting and severe wasting prevalence in 2012 were estimated at almost 8% and just less than 3% respectively.
- In 2012, approximately 71% of all severely wasted children were in Asia and 28% in Africa, with similar figures for wasted children at 69% and 28% respectively.

Overweight
- Globally, 44 million under-five year olds were overweight in 2012.
- The global trend in overweight prevalence and burden is rising. Between 2000 and 2012, overweight prevalence increased from 5% to 7% and the global burden increased from 32 million to 44 million. The rise in overweight prevalence is reflected in all regions; the burden is increasing in Africa, Asia and the developed countries, but stagnating in Latin America and Oceania.
- In 2012, overweight prevalence was highest in Southern Africa (18%), Central Asia (12%) and Southern America (7%).

Data dashboards
A suite of six on-line interactive dashboards were developed to enable users to explore the entire time-series (1990 – 2012) of global and regional estimates of prevalence and burden for stunting, underweight, overweight, wasting and severe wasting indicators by various country regional and income group classifications. The dashboards are available on-line on each agency’s website:
- WHO: http://apps.who.int/gho/data/view.wrapper_nutrition-1-1

Methodological notes
For this update, new releases of the following data sources are used: (a) the new under-5 population estimates (UN population division, 2013) were applied as weighting factors to each country survey used in order to derive the regional and global prevalence estimates and to calculate the burden (number of affected children), (b) the number of underlying national surveys used increased from 639 to 694, currently representing over 90 percent of all children under-five globally, and (c) the new World Bank income classification released in July 2013.

The approach and methodology used remains unchanged with the exception of a minor refinement better to reflect the year in which various country survey data were collected. Previously, the survey year was exclusively based on the median of year ranges, while in this round the median of month ranges for survey enumeration whenever available was also considered.

Severe wasting is included in this round, given that it is commonly used in emergency settings to reflect severe acute malnutrition. The joint UNICEF/WHO/WB data set provides this information for the national aggregate, while disaggregated sub-national estimates are available from the WHO global database (www.who.int/nutgrowthdb). The reason for presenting only the latest estimates (2012) for wasting and severe wasting is that these indicators are very responsive to infection and changes in food availability. A child’s weight relative to its height can drop quickly but also bounce back up with appropriate interventions or stabilisation of a crisis. Malnutrition prevalence estimates are generated from household surveys that only allow for a snapshot view at one short point in time (usually a few months long). In addition, surveys do not capture the duration of wasting and averages during the year are unavailable. Wasting and severe wasting thus, show fluctuations across surveys that do not necessarily reflect the whole spectrum of possible variability. A more appropriate way to have accurate estimates for these conditions would be to use annual incidence (i.e. number of cases that occur in a population during a given year). However, estimates of incidence at national or even regional level do not exist. Therefore, the estimates of prevalence are a proxy and should be interpreted with caution as even the presented confidence intervals may or may not span over the fluctuations that have occurred.

Contrary to wasting and severe wasting, the prevalence estimates of stunting, underweight, and overweight are more stable and less reactive to rapid changes in the conditions children live in.

2 Methodological details and background papers are available from http://www.who.int/nutgrowthdb/estimates2012/en
Anthropometric indicators to identify a pregnant woman as acutely malnourished and predict adverse birth outcomes

Summary of published research

Location: Global

What we know: There is no consensus on how to identify pregnant women as acutely malnourished and when to enrol them in nutritional programmes. MUAC is suggested in Sphere as a criterion, with cut-offs ranging from 21cm-23cm in different contexts.

What this article adds: A MSF literature review explored values of anthropometric indicators for acute malnutrition in pregnant women that are associated with adverse birth outcomes in humanitarian contexts. It concludes that MUAC is a reliable indicator of risk of low birth weight (LBW) and <23 cm cut-off should be used to enrol pregnant women in nutritional programmes. There was insufficient review evidence to categorise moderate and severe acute malnutrition cut-offs. Short maternal stature (146-157 cm) can be used to identify risk for LBW and obstetric complications. Further research is needed regarding risk cut-offs for BMI, maternal weight for gestation age, and maternal height and to determine to what extent nutritional programmes can avert LBW risk.

Currently there is no consensus on how to identify pregnant women (PW) as acutely malnourished and when to enrol them in nutritional programmes. According to the Sphere Guidelines, mid upper arm circumference (MUAC) may be used as a screening tool for PW, e.g. as a criterion for entry into a feeding programme. The guidelines state that cut-off points for risk vary by country and range from 21 cm to 23 cm.

Sphere suggests <21 cm as an appropriate cut-off for selection of PW at risk for growth retardation during emergencies. Some nutritional protocols enrol PW based on gestational age (mostly only in the third trimester) regardless of any anthropometric measurement. Different sections of Médecins Sans Frontières (MSF) are currently using MUAC <18.5 or <21.0 cm to include PW in Supplementary Feeding Programmes (SFPs). The United Nations High Commissioner for Refugees (UNHCR) recommends <23 cm but states also to use <21 cm, depending on the proportions of women falling under each category of MUAC and available resources.

Review

MSF Switzerland recently undertook a literature review with the purpose of determining values of anthropometric indicators for acute malnutrition that are associated with adverse birth outcomes. The study examined currently used indicators, such as MUAC and Body Mass Index (BMI), but also looked at other potentially important indicators, such as maternal weight for gestational age, maternal weight gain, and maternal height. The adverse birth outcomes that were studied were low birth weight (LBW), intra-uterine growth retardation (IUGR) and pre-term birth (PTB) as they are strongly related to infant survival.

Though maternal mortality was regarded as an important outcome to investigate, there were insufficient studies that examined maternal anthropometry and the relation to maternal mortality. Thus, it was not included in this study.

Methods

A literature search in PUBMED was done covering 1 January 1995 to 12 September 2012 with the key terms maternal anthropometry and pregnancy (only human studies in English were selected with an abstract and/or full text). The search provided 6,697 records which were subsequently narrowed down to 4,000 records when publications were filtered excluding studies with specific drugs or hormones, diseases, environmental exposure, substance abuse, triplets, twins, in-vitro fertilisation, obesity, cigarette smoking, and anaemia. The search was further limited to studies that reported on one or more of the selected anthropometric indicators (MUAC, BMI, maternal weight and/or weight gain and/or height), that provided statistical tests such as odds ratio (OR) or relative risk (RR) and on LBW, PTB or IUGR. The search provided 310 records. Additionally, four more relevant studies were found when reference lists of selected studies were examined.

Most studies indicate a MUAC ranging from <22.0 cm to <27.6 cm with statistical significance for LBW. Cut-off values of <22 and <23 cm were strongly indicative for identifying a PW as high risk for LBW. Cut-off values were not strongly linked to gestational age. As there are insufficient data available on IUGR and PTB, these outcomes were not further analysed.

Most studies indicate a BMI ranging from <18.5 to <20.5 with statistical significance for LBW. BMI changes during pregnancy, and there is insufficient evidence from this to indicate one cut-off value for a specific gestational age for BMI in developing countries. As there are insufficient data available on IUGR and PTB, these were not further analysed.

Most studies indicate a maternal weight for gestational age ranging from <43.5 kg to <50 kg with statistical significance for LBW. There is no clear cut-off value for maternal weight per gestational age, but <45 kg seems indicative for high risk of LBW in Asian countries regardless of gestational age. Insufficient data available on IUGR and PTB meant that these were not further analysed. There were insufficient data available demonstrating OR or RR on overall weight gain and cut-off values in developing countries for PW in relation to LBW, IUGR and PTB.

Most studies indicate a maternal height ranging from <146 cm to <156 cm with statistical significance for LBW. There is no clear one cut-off value for maternal height. Again, insufficient data available on IUGR and PTB determined that these were not further analysed.

The review had several limitations including only examining articles published in English, inclusion of some studies that included pregnant adolescents who may have differences in physiology and anthropometry compared with their adult peers and variations between studies in sample size, methodology and context. Comparisons therefore needed to be made with care. Another critical limitation was that there have been few studies since 1995 linking maternal anthropometry during pregnancy and maternal survival.

The authors of the review assert that the best anthropometric indicator to use in a humanitarian context would be a measurement that is simple, easy to conduct, and ideally unrelated to gestational age, as the latter is generally not exactly known in the contexts where humanitarian emergencies take place. An added value would be that the indicator can be ‘universally’ used, especially for African or Asian contexts where many humanitarian emergencies occur.

Key findings

Key findings from the review include:

- More studies need to be undertaken to research specific cut-off points for BMI to be measured, for example, in the first, second or third trimester, and that can identify risk for PW on LBW.

- In the humanitarian context where gestational age is often not exactly known, it is not possible to recommend a cut-off value on maternal weight per gestational age for universal use. It would be worthwhile to further investigate if <45 kg at any time of pregnancy could be used in future emergencies in the Asian context.

- As there is no clear evidence of which weight gain cut-off is most sensitive to LBW, and as weight gain changes per trimester and a minimal of two measurements are needed, this indicator is not useful for screening purposes in emergencies.

- Maternal height as a potential indicator for LBW lacks a clear cut-off value for general use in developing countries to identify LBW risk.

Marking the mid-point of an infant’s arm

Measuring infants aged below 6 months: experience from the field

By Martha Mwangome and James Berkley

Dr Martha Mwangome is a post-doc researcher at KEMRI/Wellcome Trust Collaborative Programme; Centre for Geographic Medical Research Coast, Kenya. She has a Masters degree in Global Health Sciences from University of Oxford, UK and a PhD degree in nutrition epidemiology from the London School of Hygiene and Tropical Medicine (LSHTM), UK. Her thesis focused on anthropometric assessment of infants under 6 months.

Dr James Berkley is a consultant paediatrician and sub-specialist in paediatric infectious diseases and immunology at KEMRI/Wellcome Trust Collaborative Programme; Centre for Geographic Medical Research Coast, Kenya, and the Centre for Clinical Vaccinology & Tropical Medicine, University of Oxford, UK. At KEMRI he leads a research group focusing on infection and inflammation in childhood malnutrition, and on perinatal health. Areas of research include assessment and management of malnourished infants below 6 months of age.

Location: Kenya

What we know: Anthropometric assessment in infants aged below 6 months present unique measuring challenges. These contribute to caregiver, infant and health worker stress and errors.

What this article adds: A research evaluation explored common challenges in measuring infants below 6 months amongst health workers accustomed to their assessment in rural Kenya. Challenges were caregiver anxiety, fear of hurting very young infants during length measurement, lack of suitable measuring equipment and lack of health worker practical experience. To overcome these, strategies to build trust; to recognise, understand and manage caregivers’ anxiety together with attention to detail (including equipment quality) were identified.

It has been estimated that worldwide 8.5 million infants aged below 6 months are wasted. Traditionally, infants aged less than 6 months have been excluded from national and regional surveys resulting in a general lack of protocol to guide their assessment. Anthropometric measurements are prone to errors, however, errors can be minimised by paying attention to all aspects of the measuring process. Minimising errors builds confidence in findings and their interpretation and therefore forms an inherent component in the use of anthropometry.

Context

Between February 2008 and August 2009, we engaged three nurses, three public health officers and eighteen community health workers (CHWs) in rural Kenya to measure common anthropometry among infants aged less than 6 months. Together, these health workers repeatedly measured the mid-upper arm circumference (MUAC), weight and length of 1226 infants. This exercise was undertaken as part of a study evaluating the reliability and accuracy of common anthropometry among infants below 6 months. Findings of this study

However, short maternal stature is strongly associated with an increased risk of obstructed labour due to cephalo-pelvic disproportion and infant underweight. Thus, short maternal stature (146-157 cm) can be used as such to identify risk for LBW; furthermore it can be used to identify women with obstetric risks.

- MUAC is a good indicator of the protein reserves of a body, and a thinner arm reflects wasted lean mass, i.e. malnutrition. However, the data indicate that a cut-off value of 21 cm might be too low. As LBW has detrimental effects on a child’s survival, it seems that a more inclusive approach with a MUAC cut-off of <22 or <23 cm should be used to indicate risk of LBW and to use as entry criterion for nutritional programmes.

- MUAC is rather insensitive to changes over the total period of pregnancy for adult women, is easy to measure, and requires only one measurement. More research is needed whether different cut-off values should be used for the Asian or African continent, but current data suggest that <23 cm appears adequate for both continents. It is also the most conserva-tive cut-off value ensuring the most PW at risk for LBW are included. It is likely that the relevance of the use of MUAC is similar in different humanitarian emergencies, be it conflict, natural disaster, sudden or slow onset.

- Currently, there is no data available that differentiates PW from being moderately or severely malnourished, i.e. having categories for MUAC that indicate high or relatively even higher risks for adverse outcomes. This does not mean they do not exist, but that this literature review does not provide sufficient evidence to support the creation of such categories.

- Further research is needed to evaluate whether the combined use of one or two easily measurable anthropometric indicators can have a high predictive power for risk of adverse birth outcomes in humanitarian contexts. In addition, research is needed to determine what extent enrolment in nutritional programmes of PW with a MUAC <23 cm can avert risk of LBW.

The authors conclude that in the humanitarian context, MUAC can be used as a reliable indicator of risk of LBW. A cut-off value of <23 cm should be used to enrol PW in nutritional programmes. National protocols from Ministries of Health and humanitarian organisations that currently use a MUAC <21 cm to enrol PW in SFPs should consider increasing the cut-off value in order to reduce the risk of LBW infants.


have been published elsewhere. At the end of the data collecting phase and as part of the evaluation process, we engaged the health workers in discussing common challenges faced during field work and strategies they used to overcome them. In this write-up, we share challenges specific to measuring infants in a rural community African setting as experienced by our study team and discuss some of the strategies applied within our study to overcome them.

**Challenges in measurement**

The challenges in measuring infants below 6 months have been categorised into four themes described below.

**Caregivers anxiety with the measuring process**

Health workers observed that caregivers of infants are anxious about the measuring process. In a society where infants are protected and shielded from the outside world, caregivers expressed to the health workers a real fear associated with the request to remove infant’s clothes before measuring. Firstly, there was the perception that the infants’ naked body will be exposed to the external environment which is likely to cause ill health. Secondly, there was concern that unprotected contact between infant’s bare skin and the shared measuring equipment would transmit skin infections from other infants.

Health workers found that engaging caregivers by i) initiating rapport with caregivers at the beginning of the process, ii) continuous engagement with caregivers during the process of measuring and iii) assuring caregiver of the safety of the infant and hygiene of the equipment, facilitated co-operation. For example, while measuring length, health workers lined disposable paper hand towels or caregivers personal scarves on the upper part of the length board, where the head and the body of the infant would lie. This simple gesture ensured comfort of the infant, enhanced the level of hygiene and improved co-operation with caregivers. Health workers also carefully wiped off any urine or other body fluids left on the measuring board by an infant and frequently disinfected the length boards using sanitisers in the presence of the caregivers. These additional precaution measures worked to enhance the level of trust, facilitated approval and co-operation from caregivers.

**Infants’ tendency to a fetal position**

Health workers observed that newborn infants (less than 3 months old) were generally calm as they would sometimes sleep throughout the measuring process. Older infants were more playful and hence more disruptive during the process. Newborn infants tended to be in a foetal position (curled up with knees bent) and presented a specific challenge while measuring length. In this process, the measurer carefully lays the infant on the length board with their head slightly touching the headboard. In order to estimate the maximum possible length of the infant, it is required that the measurer “applies gently pressure to the knees to straighten the leg”. It is this process of straightening the legs that made most caregivers overly anxious as they feared damaging and even breaking the knees of the infants. Additionally, the process of constraining an infant in a stretched up position on the infanтомeter tended to induce crying among infants which added to the anxiety already experienced by caregivers.

It is important to note that the fear and anxiety expressed by the caregivers in our sample regarding the length process are not limited to naive populations. For a while, countries like Netherlands had abandoned the measuring of length among newborns because it was thought to be harmful to the development of the hip joint. However, if instructions are followed, length measurement is not harmful to infants. In fact, the World Health Organisation (WHO) recommend length measurements for all neonates immediately after birth and firmly in position ensuring that the head board is only slightly touching the tip of the head. Caregiver’s participation helped to build the level of trust and co-operation. Further, health workers avoided measuring an already agitated infant.

**Lack of suitable measuring equipment**

Measuring equipment is a documented source of error and a source of anxiety among caregivers. Health workers observed that faulty measuring equipment, like squeaking weighing machines, chipped off measuring boards and folded MUAC tapes, present technical difficulties in measuring but more importantly, threatened the safety of the infants. They suggested the use of clean, well-maintained, well labelled and calibrated measuring equipment, especially the use of a proper infantometer for measuring infant’s length, as opposed to a make-shift wooden measuring board which is perceived to be too hard and rough for neonates and infants. The use of proper equipment gives the caregiver the impression that health workers are competent and know what they are doing. In exchange, it raises the level of confidence for health workers and enhances trust among caregivers. It also ensures that health workers enjoy the measuring experience and are likely to present more reliable and accurate readings.

**Lack of practical measuring experience**

Health workers with prior experience in handling newborns and infants, especially those who had children of their own, reported having found it easier to handle and measure infants than those who had little or no prior experience with infants. Health workers with little experience in handling neonates reported having found the process of measuring neonates difficult at first but that with more exposure, the process became manageable. To overcome this challenge, health workers emphasised the importance of the practical session with real neonates as part of the training curriculum. This would highly enhance confidence and expertise and will also enhance reliability of measurements.

**Conclusion**

Infants aged below 6 months present unique measuring challenges. Both healthcare workers and caregivers may be anxious about possibilities of hurting the infant during measurement of length, but this is not harmful when performed correctly. Building trust, recognising, understanding and managing caregivers’ anxiety while cultivating attention to details will ensure a successful and satisfactory measuring experience. For more information, contact: Martha Mwangome, email: MMwangome@kemri-wellcome.org

**References**


4. Mwangome, email: MMwangome@kemri-wellcome.org


What this article adds: A review and consultation generated a revised list of nutrient requirements for Sphere 2011 based on WHO/FAO RNIs. Requirements for protein, fat, and 19 vitamins and minerals were included; 14 population nutrient requirements for Sphere 2011 based on WHO/FAO RNIs. Requirements for energy, macronutrients remain unchanged but warrant review in the next revision. With the growing use of fortified commodities and products in food assistance operations, future revisions should also include upper limits for population consumption due to risk of excess intake.

The Sphere Handbook defines minimum standards and indicators for assessing humanitarian responses in key lifesaving areas, including food and nutrition. The current version of the Sphere Handbook was published in 2011. Previous versions of the Sphere Handbook contained lists of nutrient requirements to use to assess the adequacy of general food aid rations, a key indicator of many food assistance responses. These lists incorporated the nutrients specified by World Health Organisation (WHO) in 2006, along with some additional nutrients. However, there was a consensus among many of the Sphere consultation participants for the food chapter that, due to advancement in nutritional knowledge and awareness of micronutrient malnutrition, the list should be reviewed and additional nutrients considered for inclusion in the 2011 edition. In addition, the publication of the Food and Agriculture Organisation (FAO)/WHO 2004 Reference Nutrient Intakes (RNIs) necessitated a review of population requirements, as previous Sphere values had been based largely on the WHO safe levels of intake (see footnote 2).

Preparation of a revised list of nutrient requirements for the Sphere 2011 Handbook involved a review of previous recommendations, a consultation on which nutrients should be included, selection of the nutrient list, and calculation of new population requirements based on revised WHO/FAO RNIs. A recently published paper describes the process and justification for the selection of nutrients for inclusion and the methods used to calculate the population nutritional requirements for use in planning and monitoring general rations for humanitarian response.

Review process
A review was undertaken of nutrient requirement references and norms for emergency-affected populations that had been published since 2000. This was supplemented by an on-line consultation process that targeted key informants from WHO, UNICEF, the World Food Programme (WFP), the United Nations High Commissioner for Refugees (UNHCR), Médecins Sans Frontieres-Belgium (MSF-B), the Centres for Disease Control and Prevention (CDC), and independent consultants.

Previous versions of Sphere have mainly utilised requirements for emergency-affected populations that were also developed by WHO but expressed as “safe levels of intake”. Requirements in the latest WHO/FAO report are expressed as RNIs for all nutrients except vitamin A, which are given as “recommended safe intakes”. Requirements for copper were not specified by WHO/FAO in 2004 and were therefore taken from WHO (1996).

Population data from the UN Population Division (UNPD), Population Estimates and Projections Section, were used to determine the types of demographic profile for a beneficiary population and allow calculation of mean requirement figures. Regional data from the 2002 tables for less-developed regions were used to calculate the proportion in each age and sex category using the medium variant projection statistic.

The proportions of the different age and sex groups that constituted the reference population were calculated using Excel. Groups were defined so as to correspond with the groups used by WHO/FAO to define nutrient requirements. The requirement figures for each age and sex group were then multiplied by the proportion of the reference population in that group, and the individual group requirements were added together to give the population mean.

UNDP demographic data were only available for whole years. No specific advice was forthcoming from UNDP on how to interpolate figures within whole years. Thus to generate the proportions in the 0-6 months and the 7-11 month categories, the 1-year population was simply divided into 12 and allocated accordingly. It was surprising that for the expression of requirements, FAO/WHO use the categories 0 to 6 and 7 to 11 months, rather than 0 to 5 and 6 to 11 months. However, as the nutrient requirement data were available in these categories, they are used here for calculation.

The prevalence figures for pregnancy (2.4%) and lactation (2.6%) were taken from WHO (2000). To avoid double-counting the 5% of women assumed to be pregnant or lactating, the proportion of women in the 19-50 year age group was reduced by 5%. In reality, in most populations some of the pregnant and lactating women will be less than 19 years old, but no data were available to quantify this proportion and no reduction was performed in the 10 to 18-year age group. It was assumed that all requirements for infants from 0 to 6 months were met by breastmilk, and the requirement for this age group was removed from the calculation of the population nutrient requirements (the nutrients are included in the maternal lactation requirements). To allow calculation in the absence of additional data, it was also assumed that no nutrients were delivered by breastfeeding to older infants.

The nutrient requirement figures for adults are usually expressed by WHO/FAO for the 19-65 year age group. However, for some nutrients this age group is split into two. To calculate the male requirements for vitamin A and vitamin D, a weighted average of the requirements for men 19-50 years and 50+ years of age was used. WHO/FAO express the requirement for vitamin K as a range. A single value had to be selected to facilitate calculation of the population requirement, and for this purpose, the midpoint of the requirement range was taken for this purpose.

The requirements in pregnancy were based on two trimesters of the non-pregnant adult female requirement and one trimester of increased requirement.

A low bioavailability for iron of 5% was assumed for all the foods available to the beneficiary population. A weighted average was used for the requirements of adolescents, and it was assumed that all girls were menstruating between 15 and 18 years and none between 10 and 14 years. The requirement for pregnancy was assumed to be the same as for lactation, as no requirement figures for pregnancy are specified by FAO/WHO.

Footnotes:
1 Seal A and Thurstans S (2013). Derivation of nutrient require-
2 The first version of the Sphere Handbook was published in 1998, with subsequent versions released in 2000 and 2004. The most recent revision of the Sphere minimum standards was initiated in 2009/10. Available at: http://www.sphereproject.org/handbook/
4 In 2000, the WHO first published population safe level of intakes for energy, macronutrients and a range of vitamins and minerals for emergency-affected populations. These values were designed to be used for planning assistance for food aid-dependent populations and were based on assumptions about the demographic profile, health, weight, and activity level of the beneficiary population and the ambient temperature.
5 The revision process for the Food chapter (Minimum stan-
dards for food security and nutrition) involved a wide consultation process with humanitarian actors and those directly affected by disasters involving more than 350 people from over 20 countries including representatives of international and non-governmental organizations (NGOs), community-based organizations, national and local government ministries, academic institutions, UN agencies and beneficiaries directly.
A weighted average was used for the calculation of iodine requirements for adolescents, since WHO/FAO express requirements separately for the age groups from 6 to 12 years and from 13 to 18 years.

A simple average of the trimester requirements for selenium was used for pregnancy, and a simple average of the first and second 6 months postpartum for lactation.

Zinc requirements during pregnancy and lactation were calculated using an assumption of low bioavailability. A simple average of the trimester requirements was used for pregnancy and a simple average of the first and second 6 months postpartum for lactation.

In selecting nutrients for inclusion, it was considered that the 2011 edition should focus attention on the most important nutritional issues affecting the health of emergency-affected populations, to encourage action where problems are identified. Therefore, the number of nutrients to be included should be restricted to those for which there is either a strong international consensus on inclusion or strong evidence for malnutrition associated with deficiency or excess.

Review outcomes

The Sphere 2011 process selected all those nutrients previously specified by WHO and other UN agencies in 2000 and 2007 for inclusion. In addition, pantothenic acid, vitamin K, and magnesium had been included in the Sphere 2004 Handbook and were retained in the 2011 edition. However, it was considered that biotin should be removed, as there was a lack of both international consensus and evidence regarding its importance in relevant contexts. This process led to the final selection of protein, fat, and the 19 vitamins and minerals shown in Table 1.

There has been a tendency over time to include an increasing number of nutrients in normative documents (Table 1). This may reflect a growing awareness of the importance of nutrition, an increasing knowledge base, and the availability of tools or food assistance vehicles by which nutrients can be delivered to populations. The Sphere Project has also tended to specify a larger number of nutrients than WHO or other UN agencies.

The calculated population requirements for use in the initial stages of an emergency are presented in Table 2 and compared with those used in Sphere 2004. The requirements for vitamin A, vitamin B1, vitamin B3, vitamin B12, folate, vitamin C, vitamin D, and iron have all increased, with the requirements for vitamin B12 and folate increasing by more than 100% of the 2004 values. In contrast, the requirements for vitamin B2 and iodine have slightly decreased. Vitamin B6, copper, and selenium are the additions that were not included in the 2004 handbook. However, a safe level of intake was given for calcium by WHO in 2000; the Sphere 2011 requirement is approximately double this value.

The work on developing recommendations for micronutrient requirements for Sphere 2011 occurred in the context of a number of related or complementary initiatives. These included the introduction of nutritional quality reporting within the WFP International Food Aid Information System (INTERFAIS), based on selected micronutrient content. The nutrient recommendations adopted by Sphere 2011 were designed to take into account the need to try and ensure coherence with these different initiatives, while maintaining Sphere’s role as an independent standard-setting initiative.

Whereas the 2011 Sphere revision led to the revision of initial population requirements for 14 vitamins and minerals, the requirements for energy and macronutrients remained unchanged. It is anticipated that future revisions of the Sphere Handbook may involve an additional review of energy and macronutrient requirements.

The changes in the calculated population requirements imply some challenges for the design and delivery of food assistance. The population requirements for seven vitamins, iron, and calcium have increased significantly in Sphere 2011, due largely to the 2004 RNI values published by WHO/FAO. Further work is required to examine how these revised requirements should be taken into account in the design of food assistance packages, food products and fortification levels for staples. Of note, WFP has recently specified new fortification levels for blended foods. Proposals for new fortification levels for US PL480 blended foods have also been published. The potential role for special nutritional products, such as lipid nutrient supplements, in achieving nutritional adequacy for subgroups of general ration recipients has also been attracting increasing attention. The revision process for Sphere 2011 acknowledged this body of ongoing work, and future editions should review the evidence base at the time and its implications for programme guidance and indicators.

With the growing use of fortified commodities and products in food assistance operations, there is an increasing risk of excessive consumption of micronutrients above the upper intake levels. It may therefore be prudent for future revisions of the Sphere Handbook to include upper limits for population consumption, as well as minimum levels of intake. Finally, certain nutrients were omitted from inclusion in the Sphere 2011 Handbook, based on current evidence and international precedent. This is of course subject to change as new evidence is generated, and the basis for inclusion or exclusion of nutrients should also be reviewed in future revisions to the Sphere Handbook.
What we know:
The relationship between wasting and stunting is under researched and poorly understood. Malnutrition is a multifaceted process, resulting from a complex web of interactions, from the molecular and microbiological level of the individual, to the cultural and socioeconomic features of societies. Acute malnutrition, manifesting as wasting or 'thinness', is characterised by rapid weight loss due to an acute lack of food or a period of infection. It is generally thought of as a short-term process; infrequent, temporary, and therefore a reversible state. Linear growth retardation, manifesting as stunting or 'shortness', is a slow, cumulative process which develops over a long period as a result of inadequate intake of nutrients, or repeated infections, or both. Stunting is more likely to be chronic and irreversible.

The relationship and associations between wasting and stunting are not yet well understood. Malnutrition is a multifaceted process, resulting from a complex web of interactions, from the molecular and microbiological level of the individual, to the cultural and socioeconomic features of societies. Acute malnutrition, manifesting as wasting or 'thinness', is characterised by rapid weight loss due to an acute lack of food or a period of infection. It is generally thought of as a short-term process; infrequent, temporary, and therefore a reversible state. Linear growth retardation, manifesting as stunting or 'shortness', is a slow, cumulative process which develops over a long period as a result of inadequate intake of nutrients, or repeated infections, or both. Stunting is more likely to be chronic and irreversible.

While both types of malnutrition may share some of the same causal pathways and are unquestionably linked, limited evidence is currently available to describe the relationship and associations between them, and whether one precedes or predisposes to the other. Additionally, almost nothing has been written on the biochemical and physiological processes through which the relationship between stunting and wasting might be both mediated and magnified.

Observations from studies to date include:
- The prevalence of wasting does not act as a good indicator for the prevalence of stunting. In many countries, children experience high levels of stunting without any wasting. A large review of 175 studies examined the associations between stunting and wasting and concluded that while there was a correlation between stunting and wasting in Asia and the Eastern Mediterranean, there was low correlation in Africa and Latin America.
- Stunting has been shown to precede wasting in ‘small’ infants in Malawi; those born with a Low Birth Weight (LBW) as a result of Intra Uterine Growth Restriction (IUGR) are more likely to develop episodes of wasting between 6–18 months of age. Less clear is whether wasting precedes (or predisposes) the child to becoming stunted.
- The associations between stunting and wasting

What this article adds:
A literature review and secondary data analysis that explores the relationship between stunting and wasting will be undertaken by the ENN in 2014.

The following research questions will be considered during a literature review and consultation with technical experts:
1. Is there an association between stunting and wasting (and vice versa) in the under-five population, i.e. does stunting predispose a child to wasting? Does untreated or repeated wasting result in a child becoming stunted? If so, how is the association mediated in the body (cellular/biological/hormonal level)?
2. Is there a period of time in a child’s growth in which the interaction between stunting and wasting is most evident, i.e. in the 0-6 month age group, in the first 1000 days or in the 36-59 month age group?
3. Are there regions/countries in the world where the associations between stunting and wasting (and vice versa) are (more or less) evident? What are the factors (such as epidemiological profile) which may explain these differences?
4. Are there any gender differences in any of the above associations, for example, stronger relationships between wasting and stunting in male rather than female children or other associations such as birth order, wealth quintiles etc?
5. How are these associations best captured, given that there is a time lag between changes in weight and height velocity (estimated at 3 months) and most surveys are cross-sectional?
6. Where a child is both stunted and wasted, what is the additive impact of multiple anthropometric deficits on child mortality?
7. What is the evidence base for the early treatment of wasting leading to better linear growth?
8. What is the evidence base for programmes that aim to reduce or prevent stunting leading to a reduced case load of wasting?

The work will be completed by the end of 2014.

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**Treatment of SAM and MAM in low- and middle-income settings: a systematic review**

**Summary of research**

_The search identified 10,557 titles. Screening of these titles, full text review and data abstraction was done independently by two team members and then matched. A total of 14 studies were included in the final meta-analysis._

_The meta-analysis was conducted using RevMan 5.2_. The team applied generic inverse variance methods to all analyses and used a random effects model in all cases; summary estimates were presented as relative risk (RR) or mean difference (MD) and 95% confidence intervals (CI). Study quality was assessed using CHERG adaptation of GRADE criteria. A Delphi process was undertaken to complement the systematic review in estimating case fatality and recovery rates that were necessary for modelling in the LiST._

**Results**

Case fatality rates for inpatient treatment of SAM using the WHO protocol ranged from 3.4% to 35%. For community-based treatment of SAM, children given RUTF were 51% more likely to achieve nutritional recovery than the standard care group. For the treatment of MAM, children in the RUSF group were significantly more likely to recover and less likely to be non-responders than in the CSB group. In both meta-analyses, weight gain in the intervention group was higher, but although statistically significant, these differences were small.

The review was unable to utilise a substantial proportion of studies due to inconsistencies in admission criteria, variability in the definition of acute malnutrition (including the use of weight-for-age to assess nutritional status), and irregularities in how data were reported. In order to strengthen understanding of the effectiveness of interventions, through the use of meta-analysis, there should be standard case definitions and reporting of outcomes at standardised time intervals. Admission criteria should be based on the WHO definition of acute malnutrition, or children meeting these criteria should be presented in a disaggregated analysis.

**Location: Global**

_What we know:_ Worldwide, 33 million children under 5 years are moderately malnourished and 19 million are severely malnourished. The impact of existing care packages to manage SAM has not been widely researched. The package for MAM treatment is not well understood.

_What this article adds:_ The effectiveness of inpatient and outpatient approaches to treating SAM and approaches to managing MAM were evaluated in a systematic review. Fewer high quality studies than expected were found, limiting analyses. Case fatality rates for inpatient SAM treatment ranged from 3.4% to 35%. SAM children managed using RUTF were 51% times more likely to recover than standard care. Moderately malnourished children responded better to RUSF than CSB. Standardised case definitions, reporting outcomes by agreed time intervals and data disaggregation would improve meta-analysis potential. Studies in a broader range of contexts and including long term follow up are needed.

_Globally, approximately 33 million children under five years of age are affected by moderate acute malnutrition (MAM), defined as a weight-for-height z-score (WHZ) between -2 and -3, and at least 19 million children under five by severe acute malnutrition (SAM), defined as a WHZ of <-3. For children with SAM, the risk of death is approximately 10-fold higher compared to children with a z-score ≥ −1. Based on an analysis by UNICEF, WHO and the World Bank, 32 of 134 countries for which there were data on prevalence of acute malnutrition (WHZ < -2) had a prevalence of 10% or more - a threshold that represents a "public health emergency requiring immediate intervention". This analysis also showed that, since 1990, prevalence rates of wasting (acute malnutrition, WHZ < -2) have declined three times more slowly than for stunting (chronic malnutrition, height-for-age z-score < -2), decreasing by 11% and 35% respectively._

Since the early 2000s, the products used to deliver nutrients for management of SAM and MAM and the approaches used to target and deliver them have been evolving rapidly. Researchers recently undertook a systematic review in order to evaluate the effectiveness of approaches to managing SAM, including the WHO protocol for inpatient management, and UNICEF/WHO endorsed community-based management using Ready to Use Therapeutic Food (RUTF), as well as the effectiveness of approaches to managing MAM that involve Ready to Use Supplementary Foods (RUSF) and fortified foods such as Corn Soya Blend (CSB).

The review focused on children under five years in low- and middle-income countries. In addition, the study team aimed to identify gaps in the literature and to generate the effect estimates necessary for including these interventions in the Lives Saved Tool (LiST). LiST models the reduction in child deaths by specific causes associated with increasing coverage of individual interventions. Recent mortality rates and cause of death data for newborns, infants, and children are incorporated, by country, using estimates established by the Child Health Epidemiology Group (CHERG).

**Methods**

The research team developed comprehensive search strategies for the following databases: Medline, Embase, Web of Science, WHO regional databases and the Cochrane library and conducted hand searches for sources of grey literature, including the Emergency Nutrition Network and Epicentre websites, Grey Literature Review and the World Bank website.

MAM was defined as WHZ between -2 and -3 standard deviations (SD), weight-for-height (WFH) 70-80% of the NCHS or WHO reference median or mid-upper arm circumference (MUAC) of 115-125mm. SAM was defined as WHZ <-3 SD, WFH <70% of the median NCHS or WHO reference or MUAC <115mm or oedema.

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2 Standard care entailed treatment in an inpatient facility until complications resolved, with the subsequent provision of CSB for feeding the child at home.
Further high quality impact studies of approaches to managing SAM and MAM are needed, particularly studies that reflect a broader range of settings where these conditions are prevalent, including a range of geographic locations and areas with different disease prevalence (e.g. HIV). Though this area of research can present challenges for intervention studies, there are study design options and data analysis techniques that allow for high quality research. Where randomised controlled trials are not feasible, another option would be to employ a stepped-wedge design for research on community-based management of SAM or MAM.

This meta-analysis was constrained with respect to the types of outcomes that could be pooled. Length of stay, relapse (requiring re-admission to the hospital), default rate, sustained recovery and cost-effectiveness were not routinely measured, but are essential factors to consider in programme planning. Furthermore, all but one of the studies included in this review follow children for a relatively short period of time, providing little insight into long-term effects.

More follow-up studies are needed to illuminate long-term effects on developmental outcomes, stunting, and the transition back to a home diet. Standardised follow-up intervals over a longer time period and reporting on a wider range of outcomes would allow for higher quality meta-analyses and a more robust understanding of the intervention effects. Similarly, trials are needed to compare different approaches for the management of MAM that consider local context, as a ‘one-size-fits-all’ approach is not appropriate.

While food supplementation is necessary in humanitarian emergencies and chronic food insecurity contexts, acute malnutrition is not confined to situations of conflict or famine. In relatively more stable situations, further research is needed on preventive approaches that address upstream determinants of acute malnourishment. As the body of literature grows, it will also be important to disaggregate meta-analyses according to context. Therefore, greater geographic representation is needed, as well as studies designed to explore the impact of approaches that likely affect the individuals’ treatment outcomes, such as HIV status and household food insecurity, in addition to studies designed to tease out the elements of successful programmes, beyond the choice of commodity.

Most of the studies on severe acute malnutrition (SAM) have been on children between 6 months and 59 months of age. A recent study was conducted to determine the outcome in infants < 6 months of age with SAM, admitted to Nutritional Rehabilitation Centres (NRC) after nutritional rehabilitation. Management was based on the guidelines issued by the Ministry of Health and Family Welfare (MOHFW) in India in collaboration with WHO.

The records of all infants < 6 months admitted in the NRC over a period of 20 months (January 2011 through August 2012) were collected and analysed. The criteria for admission of these infants were weight for length (W/L) < −3 standard deviation (SD) (if length > 49 cm) or visible severe wasting or oedema both feet. The infants were admitted, managed and discharged according to the set guidelines issued by the MOHFW.

Nurses, dieticians and the cooks were specially trained in identifying children with SAM and nutritional rehabilitation protocols. Supplementary suckling techniques (SST) were applied to mothers with lactation failure. Until breastfeeding was fully established, the infants were started on non-cereal based therapeutic diet, F100-diluted (F100 D) feeds.

The infant was weighed daily using a SECA digital weighing scale (precision 5 g) at the same fixed time before feeds. When the infant had gained weight for five consecutive days at the centre and was free from any medical complications, he/she was fit for discharge. Non breast-fed infants were discharged on locally available animal milk with cup and spoon. The infants were called for four follow ups at two weekly intervals. The outcome indicators were: i) Cured: infants meeting the discharge criteria, ii) Non-responders: infants not responding to the treatment and nutritional rehabilitation during hospital stay, iii) Relapse: infant who has been discharged as cured from the hospital within the last two months but is again eligible for admission, and iv) Death.

A total of 431 children with SAM were admitted in the NRC during the period of 20 months. Of these, 108 (25%) children were < 6 months of age. The average weight gain of the infants during hospital stay was 12.9±7.3 g/kg/d. Forty-seven (43.5%) infants were < 2 months of age, 43 (39.8%) infants were 2–4 months and 18 (16.7%) infants were > 4–6 months of age. The average weight gain during hospital stay in these age groups was 15.9±10.7, 10.7±7.8 and 10.4±9.1 g/kg/d respectively. This difference in weight gain was found to be significantly different (p = 0.01).

Outcome indicators are given in Table 1. Overall, 63.8% infants < 2 months of age were successfully discharged on exclusive breastfeeding with good weight gain against 46.5% in age group of 2–4 months and 56.2% in infants > 4–6 months. Out of 108 infants < 6 months, 59 (54.6 %) were being breastfed at the time of admission, of whom only two infants were being exclusively breastfed. Forty-nine (45.4%) infants were not being breastfed at all. Thirteen (33.3%) had one or more medical complications at admission and were first stabilised in the emergency ward before transfer to the NRC; only 18 (16.7%) infants were directly admitted to the NRC. The most common presenting symptom was acute diarrhoea (35.2%) followed by failure to gain weight (26.9%). The Supplementary Sucking Technique (SST) was used in 44 (40.7 %) infants; it was successful in 32 (72.7 %) infants and failed in 12 (27.3 %) cases. Of those infants cured, 20 infants (27%) were managed by correction of breastfeeding positioning and attachment alone.

Withholding intravenous fluids and early initiation of feeding are keys to the management of children with SAM. The daily weight gain of the infants was a good motivating factor which even the illiterate mothers were able to understand. The study authors were able to achieve good weight gain in almost half of the babies on breast-feeding alone after counselling. Just over one quarter of infants (26.8%) were non responders; the main reason being that the parents were not willing to stay in the hospital for sufficient time for nutritional rehabilitation.

A limitation of the study was that it was not possible to achieve a good follow up and therefore observe how the infants fared after discharge. The study authors conclude that although most of the mothers were aware that breast-milk is the best food for their babies, many were unable to cope with the challenges of exclusive breastfeeding, such as misconceptions about producing insufficient breast milk, problems of attachment and positioning. The authors conclude that health personnel should not only be motivated but also well trained on breastfeeding techniques and its problems.

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**Table 1: Outcome indicators of infants < 6 months in NRC**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cured</td>
<td>75 (69.4%)</td>
</tr>
<tr>
<td>Correction of positioning and attachment alone</td>
<td>20 (27%)</td>
</tr>
<tr>
<td>Supplementary suckling technique</td>
<td>32 (55%)</td>
</tr>
<tr>
<td>F-100 diluted</td>
<td>23 (38%)</td>
</tr>
<tr>
<td>Death</td>
<td>3 (2.9%)</td>
</tr>
<tr>
<td>Non responders</td>
<td>29 (26.8%)</td>
</tr>
<tr>
<td>Relapse</td>
<td>1 (0.9%)</td>
</tr>
</tbody>
</table>

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**Nutritional rehabilitation of infants < 6 months with severe acute malnutrition**

**Location: India**

**What we know:** There is a significant burden of acute malnutrition in infants under 6 months of age in nutritionally vulnerable countries. There is a lack of guidance on management of this caseload and a lack of evidence to inform guidance development. Most studies and programme descriptions are on children over 6 months of age.

**What this article adds:** This study describes the feeding and clinical profiles, management strategies and outcomes of infants < 6 months managed in a Nutrition Rehabilitation Centre in India. Death rates were low (2.9%). Non-responders were high (26.8%) due to caregiver refusal to stay in hospital for treatment. Nearly half of cases (45%) were not breastfed on admission. The most common presenting symptom was acute diarrhoea. Withholding intravenous fluids, early initiation of feeds and staff trained on breastfeeding problems and management were key to success.
The World Health Organisation (WHO) recommends the use of two independent anthropometric criteria to diagnose severe acute malnutrition (SAM) among children aged 6–59 months. These two criteria are mid-upper arm circumference (MUAC) <115 mm and weight-for-height Z-score (WHZ) <−3. The use of MUAC has been endorsed by the WHO for the community-based management of acute malnutrition (CMAM). In practice, MUAC is used on a large scale as a single tool for detecting SAM because it is cheap, and community health workers (CHWs) learn to use it effectively with minimal training. The tool is also well accepted by children, due to the simplicity of its measurement. For these reasons, MUAC is a particularly useful screening tool for nutritional assessments in emergencies and for household screening.

MUAC appears to be more sensitive than WHZ in identifying high risk SAM children and predicting mortality, particularly in the younger age group (6–23 months). However, MUAC and WHZ identify different populations of SAM children with only some degree of overlap. Using only MUAC to diagnose SAM may leave out a proportion of high-risk children who might be severely malnourished as determined by WHZ. Is it justifiable to leave such potentially vulnerable SAM children out of a nutritional rehabilitation programme? In particular, how would such children fare in terms of nutritional evolution, morbidity and mortality?

These questions were examined in the context of a Médecins Sans Frontières (MSF) implemented CMAM programme in Kamrangirchar slum in Dhaka, Bangladesh. Routine analysis of nutrition programme data showed that the largest proportion of SAM children were admitted based on WHZ of <−3 while their MUAC was >115 mm. Researchers undertook a prospective cohort study of this group of children in order to assess their nutritional outcomes and report on their morbidity and mortality.

The site of the study, Kamrangirchar, has a population of 400,000 living in an area of 3.1 km². MSF started providing healthcare services for children in Kamrangirchar from May 2010. All services are provided free of charge through two primary healthcare centres (PHC). The project targets malnutrition among children <5 years of age through the CMAM approach. The management protocols are in line with the WHO-recommended WHO guidelines. The study was conducted between June 2011 and February 2012 and the study population included children aged 6–59 months (height/length between 65 and 110 cm) with a WHZ of <−3 and a MUAC >115 mm. In view of the context of prevalent stunting, children aged over 59 months but with a height <110 cm were also included.

### Study group recruitment

Children included in the study were recruited by assessing both MUAC and WHZ. Those with WHZ <−3 and MUAC >115 mm were not admitted to an ambulatory therapeutic feeding centre (ATFC) but recruited for a 3-month follow-up period. Screening took place both at the PHC and in the community. Children recruited in the PHC were assessed clinically and received treatment for any medical conditions. Active door-to-door screening in the community was done by a team of CHWs. MUAC was measured using a colour-coded measurement tape graduated in millimetres. Height/length was measured using a wooden stadiometer with a precision of 0.1 cm. Weight was measured using a hanging scale accurate to 100 g. During the door-to-door screening, children found with symptoms of fever, cough, or diarrhoea were referred to the PHC for further clinical assessment. Children found with MUAC <115 mm or oedema, or both, were excluded from the study and admitted to the ATFC as standard practice. Children with severe medical complications at baseline (measles, lower respiratory tract infection, severe anaemia, tuberculosis (TB) and severe diarrhoea) were excluded from recruitment.

### Follow up

On recruitment, all carers were briefed on the study protocols and a line-identity record was given to the carer to facilitate the follow-up of the child’s medical conditions at the PHC if required. Follow-up home visits were done every 2 weeks by a team of trained CHWs. During the follow-up visit, weight and MUAC were assessed and history of any symptoms of fever, diarrhoea (three or more loose motions per day) or cough in the past two weeks was taken. Children were referred for admission to the ATFC if their MUAC dropped to <115 mm and/or they had lost ≥10% of their baseline weight. Children were also referred to the PHC for clinical assessment and treatment if they were found with any illness. No child recruited into the study was given any ready-to-use therapeutic food (RUTF) unless they required admission to the nutrition programme.

### Sample size

The sample size was calculated based on a hypothesis that if children with WHZ, <−3 and MUAC >115 mm did not receive nutritional rehabilitation, 30% would lose ≥10% of baseline body weight or weight-for-height z-score (WHZ) and/or they would need admission to the nutrition programme as a result of the high morbidity and mortality risk during the prospective follow-up period. To detect the above with 95% confidence and 5% error, the required sample size was calculated to be a minimum of 126 children. To correct for losses-to-follow-up in the context of a generally mobile population, the sample size was increased to 158 children.

### Results

A total of 158 children were recruited into the study, with a median age of 41 months; 58% were male. Ninety-six (61%) children were recruited through the PHC facilities and 62 (39%) through door-to-door screening. At recruitment, the mean MUAC was 126 mm (SD = 19.6, range 116–144 mm), the median weight was 9.6 kg (range 5.7–13.7 mm) and the median height/length was 89.6 cm (range 67–109.5 cm). Because of the frequency of stunting among children living in Kamrangirchar, 28 children with a height of >65 cm and <110 cm and aged more than 59 months were included.

In the course of the study, a total of 1,002 follow-up home visits were done (average = 167 per 2 weeks), including 222 visits during which children were unexpectedly absent. Of the 158 children recruited into the study, 21 did not complete the 3-month follow-up period; 15 (9%) children left Kamrangirchar and six (4%) children were lost to follow-up.

Of the remaining 137 children with data on nutritional evolution and outcomes:

- Nine out of 158 children (7%) were admitted to the ATFC; five had their MUAC drop to <115 mm, one had weight loss ≥10% of the baseline weight, two had pulmonary TB and one had severe watery diarrhoea.
- Amongst the five children whose MUAC dropped below 115 mm, baseline MUAC was 116 mm in three children and 118 mm in two children. The drop in MUAC occurred after two weeks in two of the children, after 4 weeks in a further two and after six weeks in one child.
- Of the remaining 128 children who completed three months of follow-up, 91 (71%) improved in nutritional status: 81 (63%) progressed to a WHZ ≥−3 and <−2 and 10 (7%) to WHZ ≥−2. The remaining 37 (29%) children maintained a WHZ of <−3.

There were significantly fewer symptoms of cough among those who improved in nutritional status compared with those who maintained a status quo with WHZ <−3 (p = 0.005). There was no other

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All E et al (2013). Is mid-upper arm circumference alone sufficient for deciding admission to a nutritional programme for childhood severe acute malnutrition in Bangladesh? Transaction of the Royal Society of Tropical Medicine and Hygiene. DOI:10.1093/trstmh/trt18

significant difference in morbidity in the groups when compared, with WHZ $<-3$ as baseline. There was one death, from pulmonary TB.

**Discussion**

This study shows that most (93%) children who were severely malnourished in terms of their Z score (WHZ $<-3$) but judged as less severely malnourished on the basis of their MUAC ($>115$ mm) improved in their nutritional status or maintained a status quo after three months of follow-up. In this context, it would therefore seem possible to rely solely on MUAC for screening and admission into nutritional rehabilitation programmes. One strength of this study is that it is one of the first prospective studies to assess by WHZ nutritional evolution and outcomes among severely malnourished children in the Asian context. Rigorous attention was paid to follow-up visits at home and to staff training on anthropometric measurements, and the CHW team was experienced.

The study has a number of limitations. First, it followed children for a relatively short period of three months. Second, although there are no data to substantiate this, it is plausible that the bi-weekly home visits might have had a positive influence on malnutrition-related behaviour of carers or on the use of healthcare facilities, which might also have affected the results. Third, the findings of this study are representative of a cohort of SAM children without complications, as children with severe medical complications at the baseline were excluded from recruitment. Fourth, it was not possible to distinguish between new episodes of fever, cough and diarrhoea and persistent symptoms from the previous episode.

It is surprising that, in all, around seven in 10 children with WHZ $<-3$ gained weight, and moved into the moderate malnutrition category or achieved a normal nutritional status according to their WHZ, in the rather short three month follow-up period. A smaller proportion (27%) maintained their status quo. Both findings are encouraging. It is also reassuring that, despite most children having had one or more common morbidities during follow-up, only nine required admission for nutritional rehabilitation.

Three of these nine children were admitted as a result of severe medical conditions that would themselves have merited the child’s admission, irrespective of nutritional status. The one death among the study population was of one of these three children, from pulmonary TB. From a purely nutritional viewpoint, this implies that only six (4%) children were negatively affected by their initial nutritional status, which supports use of MUAC alone to screen children for admission to nutritional programmes.

A recent study in rural Bangladesh also demonstrated the feasibility and effectiveness of the CMAM approach, where CHWs used MUAC for community screening and assessment for admission and discharge. Although 27% of children in the present study maintained their status quo in terms of their nutritional evolution, it is reasonable to think that this group might be at a relatively higher risk of adverse events. Appropriate and well-timed access to health-care for such children would limit the potential deterioration of their nutritional status. Therefore it might be justified to conduct specific research to assess what increased MUAC cut-off threshold (above 115 mm) would be ideal to maximise inclusion of this subgroup. Experience in an African context in Burkina Faso suggests the use of a MUAC cut-off of 118 mm or oedema, or both, as admission criteria for SAM children, may be a useful alternative to WHZ.

**Infant feeding support at scale in the Haiti 2010 response**

**Location: Haiti**

**What we know:** Sub-optimal breastfeeding practices increase risk of infant morbidity, malnutrition and death. Emergencies increase these risks.

**What this article adds:** Targeted breastfeeding and artificial feeding support to assessed infants and children was successfully provided at scale during the Haiti response. There were many challenges including how to assess need for artificial feeding at individual and community levels, how to manage supplies of infant formula and lack of national capacity to provide skilled support to breastfeeding infants. Lessons include the need for minimum implementation and reporting standards and monitoring tools at individual and project levels.

The 2010 earthquake in Haiti displaced about 1.5 million people, many of them into camps for internally displaced persons. It was expected that disruption of breastfeeding practices would lead to increased infant morbidity, malnutrition and mortality. There was additional risk of untargeted donations of infant formula; in the weeks immediately after the earthquake, Haiti received infant feeding products from different countries in enormous quantities.

Haiti’s health ministry and UNICEF, in collaboration with local and international non-governmental organisations, established baby tents in the areas affected by the earthquake. The tents provided a safe place for mothers to breastfeed and for non-breastfed infants to receive ready-to-use infant formula. Such a large and coordinated baby tent response in an emergency context had never been mounted before anywhere in the world.

Baby tents were set up in five cities but mainly in Port-au-Prince, where the majority of Haiti’s 1555 camps for displaced persons had been established.

Between February 2010 and June 2012, 193 baby tents were set up; 186,499 mother-infant pairs and 52,503 pregnant women were registered in the baby tent programme. Of infants younger than 6 months, 70% were reported to be exclusively breastfed and 10% of the “mixed feeders” moved to exclusive breastfeeding while enrolled. In 2010, 13.5% of registered infants could not be breastfed. These infants received ready-to-use infant formula.

**Challenges**

There were many challenges requiring ‘real time’ innovation to address them, including:

- Pre-emergency breastfeeding practices and guidelines were poor.
- Training materials for the Haiti context on infant formula use did not exist.
- The health ministry was severely disrupted affecting the availability of trained health workers and psychologists.
- Displacement disrupted social cohesion and community support.
- Determining community infant formula needs, procuring supplies and managing stocks were all a challenge.
- Urban mothers often worked outside the home and left infants in the care of others.

**Key lessons**

Thanks to rapid programme scale-up, breastfeeding practices remained undisrupted. Key lessons were:

- It is important to promote optimal infant and young child feeding practices through people with effective counselling skills during times of normality, before disaster strikes.
- There is a need for clear and easily adaptable infant feeding guidelines for emergencies that include a set of minimum implementation and reporting standards and monitoring tools for use at the individual and project levels.
- Involvement of community leaders and care-givers in the design and implementation of baby tent programmes are essential to ensure community awareness, participation and follow-up.
- There is a need for a clear strategy for transitioning baby tent activities into facility and community programmes.

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Participatory food preservation

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By Vimbai Chishanu, Okello Aldo

Circles

Positive

Impact and
garden in Ulang

eggplants from

NIPP kitchen

Harvesting

Sudan

©Goal ©Goal

Figure 1: Diagram of key components of the NIPP circles approach

The Nutrition Impact and Positive Practice (NIPP) circle methodology is a community nutrition approach to address problems of malnutrition sustainably by supporting communities to help themselves, using locally available resources and low-cost technologies. It can be used as a community based alternative for the treatment of mild or moderate acute malnutrition and as a preventative tool to reduce risk of new episodes of acute malnutrition from occurring. Thus it should help contribute to a reduction in stunting and low birth weight, caused by malnutrition related intrauterine growth retardation.

NIPP circles are used in community contexts where undernutrition (in any section of the demographic) is common and where a lack of dietary diversity and inappropriate social, care, health or environmental health practices have been identified as contributory factors in causing malnutrition. NIPP circles aim to improve the nutrition security and care practices of households (HH’s) either affected by, or at risk of suffering from, malnutrition, through participatory nutrition/health education and dietary diversity promotion. The design engages with both males and females to highlight issues surrounding and affecting nutrition, which both enhances the role of men in childcare and supports females to engage in positive practices.

How NIPP circles work

The overall approach is reflected in Figure 1. NIPP circles are gatherings of males and females separately within a community. A “macro circle” is broken down into three separate circles: parallel male and female circles of representatives of targeted households, and a third circle for key community figures (traditional healers, influential religious figures, respected elderly, etc.). The community circle is only undertaken at the outset of the project to maximize awareness and transparency of what the project aims to achieve. Over a period of usually 12 weeks, the members of the male and female circles meet on a regular basis for 2-3 hours, at multiple junctures during the week (decided by themselves) to share and rehearse positive behaviours.

The circles aim to facilitate knowledge and skills sharing of both men and women using group discussions, practical exercises and positive reinforcement to help families adopt sustainable, positive behaviours. There are three main areas of focus: (a) Behaviour Change Communication and Counselling - for improved awareness and practice (b) Micro-gardening - for improved nutrition security and (c) Cooking demonstrations for improved feeding and care practices. This allows the project to address many of the underlying causes of malnutrition (see Box 1 for more details).

There are a number of target groups that may be admitted; the highest risk individuals are prioritised (see Table 1). Admission may include children discharged from outpatient SAM treatment, children with MAM, malnourished at risk infants < 6 months of age, malnourished pregnant or lactating women, and families with chronic illness. Caregivers who wish to participate irrespective of a child’s nutritional status may also do so, on the basis that young women or
Table 1: Admission and discharge criteria for female circles

<table>
<thead>
<tr>
<th>Admission criteria to female circles</th>
<th>Discharge criteria for female circles</th>
</tr>
</thead>
</table>
| • All children recently discharged cured from OTP* | • MUAC ≥12.5 cm for children at the end of the NIPP Circle cycle and  
| | • Carers pass the post-test assessment (includes theory and practical elements) |
| Families with children with moderate MN: | • MUAC ≥11 cm for children 6-59m; MUAC ≥11 cm for infants 2-6 months; improved nutritional status for infants <2m on ‘road to health’ charts (verified at health facility) at the end of the NIPP Circle cycle |
| • Children 6-59m with MUAC 11.5 cm - <12.5 cm | • Carers pass post-test assessment (includes theory and practical elements) |
| • Children 6-59m with WHH <80% referred from a health facility | • MUAC ≥11 cm for children 2-6 months; improved nutritional status for infants <2m on ‘road to health’ charts (verified at health facility) at the end of the NIPP Circle cycle |
| • Children 6-59m with WHH > 80% or growth faltering on ‘road to health’ chart | • Carers pass post-test assessment (includes theory and practical elements) |
| Infants 2-6m with MUAC <11 cm with appetite | • MUAC ≥12.5 cm for children 2-6 months; improved nutritional status for infants <2m on ‘road to health’ charts (verified at health facility) at the end of the NIPP Circle cycle |
| Infants <2m visibly thin but with appetite | • Carers pass post-test assessment (includes theory and practical elements) |
| Malnourished pregnant or lactating mothers (MUAC <23 cm – cut-offs may vary by country as per national guidelines) | • MUAC ≥12.5 cm for children 2-6 months; improved nutritional status for infants <2m on ‘road to health’ charts (verified at health facility) at the end of the NIPP Circle cycle |
| • Families with chronic illness (including HIV cases), families with twins or multiple births, families where the primary carers show a keenness to participate to improve their public health nutrition education (PHN) knowledge | • Carers pass the post-test assessment (includes theory and practical elements) |

Defaulter criteria for female circles

If the primary carer is absent for two sessions consecutively and the team are not able to trace her, the HH should be discharged from the Circle as a defaulter on the second session. Similarly, if they are able to trace her but she is not interested in returning, the HH should also be discharged as a defaulter on the second session.

Non-responder criteria for female circles

If the relevant discharge criteria have not been attained at the end of the Circle period, the HH can be discharged as a non-responder (NR). If their non-response is thought to be due to lack of adequate behaviour change, the HH should ideally be readmitted into the next Circle for a repeat cycle. If however, non-response is thought to be due to an underlying clinical condition, they should be referred to the nearest health facility for assessment.

Referral criteria to OTP for health facility - if referred, should be discharged from the NIPP Circle

1. Child 6-59m with MUAC <11.5 cm; WHH <70% or below 70% on their ‘road to health’ chart
2. Child with bilateral pitting oedema
3. Infant, child or adult not clinically alert and well
4. Malnourished infant or child with no appetite
5. Infants less than 6 months who are failing to thrive (diagnosed by plotting serial weight for age on road to health chart)
6. Unexplained weight loss or static weight gain at the end of the Circle cycle with regular attendance

M: malnutrition; WHH: Weight for height % of the median; WA: Weight for age; MUAC: Mid upper arm circumference; NR: Non-responder; HH: household; OTP: Outpatient Therapeutic Programme
* Includes children ≥9m.

As the NIPP circle approach involves promotion of key nutrition, health, WASH and livelihood behaviours, the relevant Ministries of Health and Agriculture are key stakeholders in each country. These government partners, in addition to the GOAL sector staff in country, provide technical trainings to staff and volunteers, including MUAC screening, counselling and behaviour change techniques, construction and use of micro-gardens, construction and use of fuel efficient stoves, participatory cooking demonstrations, food preservation, processing and storage, tippy-taps (or alternative) and latrine construction. They also assist with monitoring and support to households to implement behaviour change and assist with data collection where workload permits.

In addition to close collaborations with government ministries, local CBOs and national NGOs have also been engaged to run NIPP circles, whereby financial outlay is purposefully kept to a minimum to encourage sustainability. In Sudan, the local NGO ‘WOD’ is piloting 47 NIPP circles in Kasala state and ALMANAR is piloting eight circles in Khartoum. In South Sudan, SMART, a local NGO, is working with GOAL to understand supervision mechanisms and to assist with anthropometric measurements and micro-gardens.

All elements of the programme – from visual aids to education approaches to fuel efficient stoves – have been well received. Despite apprehension by GOAL staff and partners, in most locations, families are happy to contribute the food for the cooking demonstrations undertaken in the female circles, which is very positive, as their individual outlays are no greater than that they would have invested in feeding their children/themselves, but as a collective is far more powerful. Running a project through community volunteers (with no financial incentives) has also been a success aided by a sensitive community approach, adequate dialogue and a limit to the investment of time needed; most lead volunteers only have to engage in a handful of circles, to cover eligible neighbours. Support can then be relocated elsewhere to start up new circles.

Health centres are linked directly with the NIPP circles, with participants referred to health facilities for available services (illness – chronic or acute, antenatal and peri-natal care, expanded programme on immunisation (EPI) and growth monitoring where appropriate). Outpatient therapeutic programme (OTP) discharges are referred to NIPP circles after their severe acute malnutrition has been resolved. This can be done in conjunction with supplementary feeding programmes (SFPs) or independently, as often the causes of malnutrition are far greater reaching than merely food insecurity alone.

Programme rollout

GOAL is rolling out the NIPP circles in South Sudan, Sudan and Zimbabwe:

• The first pilot was carried out in South Sudan in late 2011 and so far, 50 macro-circles have been set up in 2013 across four locations (11 in Agok in Abeyi Administrative Area, 16 in Twic County in Warrap State and 23 in Baliet and Ulang Counties in Upper Nile State).

• GOAL began piloting the NIPP circle project in Sudan in late 2012 in North Darfur where 20 circles have been implemented by GOAL. 47 circles through the partner Waad Organisation for Development (WOD) in

MN: malnutrition; WHH: Weight for height % of the median; WA: Weight for age; MUAC: Mid upper arm circumference; NR: Non-responder; HH: household; OTP: Outpatient Therapeutic Programme

* Includes children ≥9 months.
Kassala State, and 8 circles through the partner Almanar in Khartoum State. To date, there have been 123 circles implemented across both country locations.  
• The NIPP circle project also began in Zimbabwe in mid-2013 and at the end of 2013, 24 circles had been implemented in Zimbabwe in each of the districts of Harungwe, Makoni and Nyanga, totalling 72 macro-circles. The Zimbabwe project has funding for 3 years through the DFID Global Poverty Action Fund (GPAF) grant and plans to complete 432 macro-circles across the three districts by February 2016, whereby approximately 22,000 direct beneficiaries will have been reached.

Programme challenges
The main challenge that this project has faced across all locations is poor male participation in the circle activities, despite motivation from communities. This is starting to improve in Sudan where successful graduates are used to encourage other men to attend the circles and attendance certificates are provided after successful graduation. Since this project is a ‘no hand-out’ project, house-holds themselves providing the necessary inputs, volunteer participation is a challenge in South Sudan. This is especially an issue if partner organisations working in the same areas have volunteer incentives (payments) as part of their approach.

GOAL has identified non-material incentives used in some sites to further motivate volunteers, including volunteer recognition days, certificates for completing the training and engaging volunteers in other GOAL projects, such as female literacy programmes. Lastly, in Sudan the shortage of water can be a challenge in dry areas, so maximising yields during rain fed seasons is promoted with subsequent processing, preservation and storage being used to improve access to harvested produce during the lean seasons. This approach is combined with the promotion of household waste water use to water reduced sized micro-gardens during dry spells.

Table 2: South Sudan results from female circles during 2013

<table>
<thead>
<tr>
<th>State/Area</th>
<th>Warrap State</th>
<th>Abeyei Administrative Area</th>
<th>Upper Nile State</th>
<th>Upper Nile State</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country/area</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Twic</strong></td>
<td>Agok</td>
<td>Baliet</td>
<td>Ulang</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong># Female circles opened</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>6</td>
<td>6</td>
<td></td>
<td>Results from female circles only have been highlighted in this table, as most data are collected from these groups.</td>
</tr>
<tr>
<td><strong>Date opened</strong></td>
<td>May 2013</td>
<td>Feb – Aug 2013</td>
<td>June 2013</td>
<td>March 2013</td>
<td></td>
</tr>
<tr>
<td><strong># of admissions into female circles</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>(1 x PLW, 28 x children 6-59m)</td>
<td>97</td>
<td>(1 x 2-6m, 74 x 6-59m, 4 x OTP dish, 17 x PLW, 1 x other)</td>
<td>60</td>
<td>(41 x 6-59m, 15 x PLW, 4 x other)</td>
</tr>
<tr>
<td><strong>% graduating successfully (n)</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>96.6% (28 success, 1 DEF)</td>
<td></td>
<td>66.7% (33 success, 22 DEF, 2 NR, 1 REF, 39 graduated datasets uncollected)</td>
<td>57.4% (27 success, 4 DEF, 16 NR)</td>
<td></td>
<td>In Agok, the circles suffered from high defaulter rates. Ulang’s relatively high NR rate may be attributable in part due to GOAL’s access to Ulang being compromised at times during the cycle, so the requisite support was not always available.</td>
</tr>
<tr>
<td><strong>% of children 6-59m admitted with a MUAC &lt;12.5cm reaching graduation with a MUAC &gt;12.5cm &amp; PLW admitted with MUAC &lt;23cm reaching graduation with MUAC &gt;23cm</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>96.6% (27 of 28 children admitted on MUAC &gt;11 of 1 PLW achieved MUAC targets upon graduation)</td>
<td>60.4% (of 58 full datasets, 32 of 53 children admitted on MUAC achieved MUAC cut-offs upon graduation, no complete PLW data collected)</td>
<td>90% (26 of 41 children admitted on MUAC &gt;11 of 15 PLW achieved MUAC targets upon graduation)</td>
<td>59% (6 of 11 children admitted on MUAC &gt;20 of 33 PLW achieved MUAC targets upon graduation)</td>
<td></td>
<td>Of those admitted based on MUAC, results for non-succesesses were as follows:</td>
</tr>
<tr>
<td><strong>% eating produce from the microgarden at graduation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>92%</td>
<td>97.2%</td>
<td>100%</td>
<td>56.8%</td>
<td></td>
<td>No baseline was collected as most HHs didn’t have microgardens prior to NIPP Circle support. The % in Ulang was lower than the other sites because some of the participants still chose to sell the produce in the market rather than eat it in the household, despite advice to prioritise HH consumption. Due to GOAL’s access to Ulang being compromised at times during the cycle, support to beneficiaries to encourage household consumption was limited. GOAL is working to address the issue of access for future circles.</td>
</tr>
<tr>
<td><strong>% showing improvement in knowledge on causes of malnutrition</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>89.3% improvement in knowledge (from 90% to 97%)</td>
<td>30.13% improvement in knowledge (from 67% to 97%)</td>
<td>50% improvement in knowledge (from 50% to 100%)</td>
<td>24.3% improvement in knowledge (from 61.7% to 86.1%)</td>
<td></td>
<td>Baliet/Ulang recruited staff immediately prior to the start-up of NIPP circles, so their knowledge on the topics was more limited than other sites. Now they have undergone training, this should improve moving forward. Baliet/Ulang NIPP circle volunteers spent a lot of time on the micro-garden element, so less time was spent on some other topics. This will be rectified in future circles to ensure sufficient time is spent on all aspects.</td>
</tr>
<tr>
<td><strong>% knowing how to make high-energy porridge at baseline and at graduation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0% baseline, 92.3% graduation</td>
<td>51.0% baseline, 71.7% graduation</td>
<td>71.7% baseline, 93% graduation</td>
<td>59.6% baseline, 93% graduation</td>
<td></td>
<td>Note: Graduation percentages are based on total no. of discharges less defaulters, as graduation data could not be collected for those having defaulted from the circle cycle</td>
</tr>
<tr>
<td><strong>% with latrine evidence of use in the homestead at baseline and at graduation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5% baseline, 7.4% graduation</td>
<td>0.0% baseline, 14.3% graduation</td>
<td>3.3% baseline, 12.8% graduation</td>
<td>2.1% baseline, 2.4% graduation</td>
<td></td>
<td>GOAL’s WASH staff were unable to participate fully in this initial round of NIPP circles due to staff absences and without technical support, often latrine pits collapsed prior to completion of the latrine. In the future adequate WASH support is planned which will allow beneficiaries to observe several alternatives for latrine construction.</td>
</tr>
<tr>
<td><strong>% with handwashing facility and evidence of use in the homestead at baseline and at graduation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0% baseline, 10.7% graduation</td>
<td>47.9% baseline, 82.9% graduation</td>
<td>0.0% baseline, 21.3% graduation</td>
<td>2.13% baseline, 7.1% graduation</td>
<td></td>
<td>As per the above, there was inadequate WASH support provided during this round of NIPP circle cycles. Uptake of households willing to construct and use handwashing facilities in the homestead in Agok however was higher due to the beneficiaries largely being Muslim, where handwashing is an inherent part of their lifestyle.</td>
</tr>
</tbody>
</table>
Programme monitoring
A longitudinal monitoring system has been designed to enable GOAL to monitor various outcomes, including anthropometric status of young children and PLW, care and feeding practices, micro-gardening, food use, hygiene-sanitation practices and HIV prevention awareness. A guiding principle has been to make the data collection realistic and as easily replicable by GOAL/partner field teams as possible. In Sudan, where two local NGOs are implementing, they are undertaking data collection. Data points are collected at baseline, upon graduation for all admissions, then 2 months, 6 months and 12 months post-graduation for a significant sample, which will help to provide a picture of the sustainability of different elements of the project.

Graduation is based on admitted participants with MAM achieving improved anthropometric status, attaining a certain level of knowledge and demonstrating that they are using newly acquired practices at a household level. If admission is not based on MAM, participants still have to achieve the latter of the three requirements. If significant relapse is observed at a particular juncture post-graduation, the design of the project could feasibly be adapted to include one-off or short-term refresher sessions, to further cement positive behaviour change.

At the time of writing, we have verified results in Sudan and South Sudan at graduation only, whereby both countries have been affected by political and security associated access restrictions, delaying original implementation and support plans. Tables 1 and 2 outline a selection of the key findings from the database.

Project costs
As the Zimbabwe project has stand-alone funding, it is more straightforward to estimate beneficiary cost (Sudan and South Sudan projects have a number of funding sources that complicate costing).

Costings are based on the projected plans for incremental rollout over a three year period, which will help to provide a picture of the sustainability of different elements of the project. Costing is more straightforward to estimate beneficiary cost as we have only considered the core direct beneficiaries (usually children), where the average HH size in Zimbabwe is 4.3. Thus direct beneficiaries would amount to no less than 21,000 individuals. The total project budget is £1.4 million. Thus a conservative calculation of the cost per beneficiary (as we have only considered the core direct beneficiaries) would amount to ~£67/person. At a later stage, we will be able to take into consideration success rates. But given that the project aims to achieve sustained behaviour change, tackling a broad range of contributory causal factors, at this early stage, this is deemed an effective use of money in the fight against both acute and chronic forms of malnutrition.

### Table 3: Sudan results from female circles during 2013

<table>
<thead>
<tr>
<th>State/Area</th>
<th>North Darfur</th>
<th>East Sudan</th>
<th>Khartoum</th>
</tr>
</thead>
<tbody>
<tr>
<td>County/area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kutum</td>
<td></td>
<td></td>
<td>Mayo</td>
</tr>
<tr>
<td># Female circles opened</td>
<td>10</td>
<td>47</td>
<td>8</td>
</tr>
<tr>
<td>Date opened</td>
<td>March 2013</td>
<td>April and July 2013</td>
<td>March 2013</td>
</tr>
<tr>
<td># and type of admissions into female circles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>145</td>
<td>(78 x 6-59m, 54 x OTP discharges, 2 x PLW, 2 x other)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>703</td>
<td>(13 x &lt;6m, 565 x 6-59m, 70 x OTP, 55 x PLW)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>97</td>
<td>(although only 2 ggs, total of 28 members)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of children 6-59m admitted with a MUAC &lt;12.5cm reaching graduation with a MUAC &gt;12.5cm &amp; PLW admitted with MUAC &lt;23cm</td>
<td>81.2% (63 of 78 children admitted on MUAC and 2 of 2 PLW achieved MUAC targets on graduation. Also, of the OTP referrals (admitted irrespective of MUAC) of the 54 admitted, 36 had a MUAC &lt;12.5cm, 30 reached grad’ with a MUAC &gt;12.5, 5 did not &amp; 1 defaulted = 85.7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% showing improvement in knowledge on causes of malnutrition</td>
<td>60.5% improvement in knowledge on causes of malnutrition (from 33.3% to 93.8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% knowing how to make high-energy porridge at baseline and at graduation</td>
<td>15.9% baseline, 95.9% graduation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% HH reporting functioning latrine with evidence of use in the homestead at baseline and at graduation</td>
<td>68.3% baseline, 96.6% graduation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% with handwashing facility and evidence of use at the homestead at baseline and graduation</td>
<td>37.8% baseline, 97.3% graduation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Successful graduation includes achieving a MUAC 12.5cm or greater if aged 6-59 months/a MUAC 23cm or greater when PLW, in addition to passing a post-test which includes verifying key behaviour changes through home visits. To successfully graduate, all discharge criteria – target MUAC, knowledge attainment and practice demonstration – must be met.
Lessons learnt

There have been many positive outcomes, some unexpected, from the NIPP circle project. These can be used to strengthen interventions moving forward. For example, in one location in South Sudan, the circle members set up their own small village savings and loans scheme independently of GOAL (as they had previously been exposed to such a scheme). The savings were used to buy subsequent cycles of seeds, as many varieties available to them were hybrid and thus not self-regenerating. In another site in South Sudan, one of the male circles requested that they be tasked with the practical construction and maintenance of the micro-gardens instead of their wives, as part of role-sharing between themselves and their spouses. This is particularly attractive as we are conscious of the ‘do no harm’ element of the project and do not wish to overburden HH members, particularly mothers, with additional tasks that might negatively impact other positive practices. We have witnessed the significant role grandmothers play in family nutrition. Although the NIPP Guidelines outline that female circles should include female primary carers and female elders, the inclusion of mother-in-laws and grandmothers had been somewhat overlooked during the initial start-up of NIPP circles. In the future, these influential groups will be explicitly invited to join the female circles, either for all sessions, or if regular attendance is not possible, particularly when IYCF practices are being discussed.

On the negative side, GOAL have experienced problems in a number of field sites, whereby poor coordination between partner NGOs has resulted in the promotion of non-NIPP projects using different forms of volunteer incentivisation (either financial, food or non-food items) leading to difficulties in compliance for the NIPP project that works through true volunteers. Naturally, it will be demotivating for a NIPP volunteer to learn that ‘volunteers’ in other projects are receiving monetary or material incentives when they are not. Given that GOAL has striven to design a sustainable and replicable community based project, the provision of non-sustainable incentives would undermine this whole ethos.

For all implementing GOAL support teams, it has been particularly interesting to facilitate a project that seeks to address malnutrition through an integrated and multi-sectoral community based approach, using close coordination between sectors. In addition, it has been shown that it is possible successfully to incentivise volunteers through volunteer recognition days, group photographs displayed in the community and regular field visits to support volunteers. The removal of commonly used financial or ‘gift’ incentivisation means that not only is there a far greater sense of individual and community ownership of the project, ensuring that only people who really want to improve their quality of life participate in the circle cycles, but that local partners, national NGOs and the Ministry of Health would in theory all be able to run the project longer term at minimal cost. So far the project has proven more successful in rural areas than urban areas, indicating that a modified approach may be needed for urban contexts.

For more information, contact: Hatty Barthorp, GOAL, email: hbarthorp@goal.ie, Mutza Dzimba (Zimbabwe programme), email: mdzimba@zw.goal.ie, Frank Okello (South Sudan programme), email: ofrank@ss.goal.ie and Sarah Ibrahim Nour (Sudan Programme), email: sibrahim@sd.goal.ie

Field Article

Sectional integration ‘on the cheap’ with cash based programming

By Holly Welcome Radice

Holly Welcome Radice has worked for 15 years in food security programming in Africa and Latin America. She was the Head of Food Security and Livelihoods for Save the Children’s Somalia/Somaliland country programme from 2011 to early 2014.

The author would like to thank the Save the Children Somalia/Somaliland education, child protections and Puntland Food Security and Livelihoods teams, as their tireless implementation of the work contributed to this article.

I ntegration of different sectors into one programme seems the obvious answer to meet diverse needs faced by households in humanitarian crisis, but integrated programmes often happen more in theory and less in practice. Multi-sectoral projects, with activities running side by side, are the norm rather than situations where needy households can have more than one of their needs addressed within the same humanitarian project. While integrated programmes might suggest greater overall efficiency, there is little evidence to support or dispel this hypothesis.

Furthermore, by design, funding constraints or the need to balance work across geographic areas, practical sectoral integration is often not achieved. Cash based programming (CBP), however, does lend itself very easily to “hidden” integration effected through one modality. Save The Children Somalia/Somaliland has seen that CBP is one easy way to integrate sector objectives and shares some experiences in this article.

CBP in Somalia

Save the Children has been implementing CBP in Somalia since 2005. A variety of CBP modalities have been used including:

- unconditional cash relief
- conditional grants (cash for work, business grants, community level disaster risk reduction activities)
- vouchers for services (e.g. animal health treatment)
- vouchers for commodities (e.g. food, restocking of goats)

Save the Children has used CBP in rapid onset disasters such as floods and tsunamis, slow onset disasters such as droughts, and longer-term safety net programmes. Most of the CBP has used the hawala transfer system. In some remote areas of Puntland, Save the Children has made agreements with local cash facilitators to pre-finance cash transfers in the absence of available hawalas.

Most recently, Save the Children has piloted the use of mobile phones for e-transfers, which is growing in use and as a
means for humanitarian actors to implement CBP in Somalia.

The diversity of delivery modalities is overshadowed by the fact that the CBP has almost exclusively been implemented in the food security and livelihood sector. This is not unique to Save the Children or Somalia but is a common feature in many countries. Given that Save the Children’s country programme has seven sectors, integration seems like a natural objective, but has met with only partial success. However, monitoring data shows that CBP has significantly contributed to other sectors and fostered integration as an unintended, positive benefit.

**Education supporting food security**

An emergency education project in Galgaduud, Central Somalia used food vouchers, which contributed to household food security, as an incentive for school attendance of children. Children enrolled in 24 Save the Children supported schools were required to reach a minimum of 85% attendance over three months for his/her household to qualify for the vouchers. All 3,176 students (1,975 households) qualified for the one-off voucher scheme. The intervention supported approximately 17% of the learners enrolled in the region. Some 27 villages were represented in this activity including six internally displaced population (IDP) areas. Exact commodities for voucher exchange were decided at the local level through community education committees. Local businesses were then selected to provide the supplies through a reimbursable voucher to Save the Children.

The food vouchers were distributed during a critical period – the long hunger gap. The value was designed to meet 30% of the food part of the Minimum Expenditure Basket (MEB) for Galgaduud Region. According to the registration data, nearly 50% of the students were from the same households; therefore nearly half of the households received 60% of the food portion of the MEB. The food received through the vouchers scheme lasted for 35 meals on average or approximately 17 days.

In the following year, there was a 41% increase in school enrolment of boys and girls. This increase would have constituted an estimated 6% increase on the global regional enrolment. Staff observations attributed this partly to the food vouchers. This increase in enrolment is extremely encouraging in a region were only 4% of boys and girls have completed formal schooling.

**Food security supporting education**

In response to the 2011 crisis in Somalia, Save the Children implemented an emergency project in the remote district of Ishkushaban, Puntland. The objective was that targeted households would improve their access to basic food and non-food needs.

One activity in the project provided unconditional cash transfers to 333 drought affected households (1,888 people). The three villages were selected based on their vulnerability (e.g. severity of drought, number of IDPs and destitute pastoralists), connection to functional markets, and presence or non-presence of other actors. Sensitisation and beneficiary selection was undertaken with guidance for local authorities and village elders and ultimately village relief committees. The latter group was charged with the actual selection of potential households based on criteria jointly agreed upon by the communities and Save the Children field staff.

Community lists of potential beneficiaries were later verified through visits to a sample of recommended households by Save the Children staff. In addition, the lists were read publically at village based meetings with beneficiaries and non-beneficiaries, where communities were able to verify the eligibility of selected households.

Each household received US$85 for six consecutive months using hawalas. This amount corresponded to an average of 45% of the full MEB for Bari Region with considerable variation over the six months (48-63%) as market prices changed significantly during the period.

While the activity was aimed at promoting food security, the beneficiaries dictated their priorities. Throughout the distribution period, an average of 18% of the grant was used for school fees - second only to food expenditures. Between 70-90% of the households claimed to use part of the grant for education expenses. The beneficiaries demonstrated through their choices that underlying causes of vulnerability (in this case, lack of education) can be addressed in a humanitarian intervention without detracting from the original food security objectives.

An external evaluation confirmed the importance communities put on the use of cash relief for education. The headmaster of one of the villages stated:

> “This project is good. It has helped mothers to pay the tuition fee on time. As a result of this project, the number of school enrolments were increased and fee defaulting reduced.”

**Livelihoods supporting child protection**

CBP can indirectly have positive child protection outcomes. In urban Hargeisa in Somaliland, Save the Children launched a livelihoods cash grant activity through a child protection project. The project is based in three IDP settlements in Hargeisa and targets approximately 140 households with one-off cash grants for livelihood / income generating activities received via hawalas. Grants have varied depending on the enterprise proposed by the household and ranged from US$250-400. Prior to receiving the grants, households received a short business training.

Beneficiary households were targeted from the overall beneficiaries already receiving child protection support from Save the Children and its partners in the area. From this list, Save the Children and its partners worked with community level groups to identify further households that were likely to have positive child protection outcomes from the grant and had earning capacity, among other criteria.

Monitoring from the pilot phase showed an immediate positive impact, with at risk children being enrolled in school, eating more meals a day and no longer being sent to beg or work for the family.

**Integration through modalities instead of stand-alone activities**

Most non-governmental organisations (NGOs) now strive to implement integrated multi-sectoral programming; perhaps the means to do so is by changing the approach and modality. Because of CBP’s inherent flexibility, households can decide on priority spends for cash, which inevitably span across the many needs that they have. Truly integrated projects or programmes may be practically difficult to achieve on the ground. Save the Children’s experience shows that a well-planned CBP activity may foster integration led by beneficiaries with no additional need for administrative direction.

For more information, contact: Ilaria Manunza, Deputy Director of Programme Quality, Save the Children Somalia/Somaliland, Ilaria.Manunza@savethechildren.org or Holly Welcome Radice, email: holly.radice@savethechildren.org or hbradice@yahoo.com or +254 733 444 092.

2. Private money transfer systems that are very common in Somalia. They are used in a context that lacks a formal banking system.
4. The Food Security & Nutrition Analysis Unit in FAO Somalia developed the minimum expenditure basket (MEB) consisting of minimum quantities of essential and basic food and non-food items. It represents a minimum set of basic food items comprising 2,100 kilocalories/person/day for a household of 6-7 and non-food items such as water, kerosene, firewood, soap and cereal grinding costs. It is monitored monthly for all regions of Somalia. The food part of the MEB is approximately 70% on average.
5. Based on baseline data of an average of two meals per day.
7. Assessment of education, livelihoods, living conditions and needs.
The third report in the Aid for Nutrition series, Maximising the Impact of Nutrition-Sensitive Interventions, was published in September 2013 by Action Against Hunger. This article, written by the Institute of Development Studies and ACF International, pulls together the available evidence of interventions in nutrition-sensitive sectors which are likely to bring about the best improvements in rates of undernutrition. A framework for prioritising nutrition-sensitive interventions in different contexts is proposed. This is a starting point for ongoing research and experience sharing.

The previous reports in the series focused on ‘nutrition-specific’ interventions to address immediate causes of undernutrition. Much less is known about which ‘nutrition-sensitive’ interventions will bring about the most impact.

Pathways for the education sector involve links between education and income, and between parental income and child nutrition. Information about health and nutrition could be transmitted through the education system. The main proposed intervention is an expansion of access to primary and secondary education, particularly for girls and young women. Education exists which proves that education of the mother reduces the risk of child stunting by a greater degree than education of the father. With regard to the health sector, the analysis focuses on the area of family planning which bears strong links to nutrition outcomes. It states that too short an interval between pregnancies can deplete a woman’s nutritional reserves, claiming that extending birth intervals to an optimal 18-24 months could reduce child stunting by up to 50%. Proposed interventions revolve around distributing family planning information via home visits and existing education systems.

Some interventions appear under more than one sector. Social protection, for example, may provide additional finance so that more nutritious food can be purchased, or provide that food directly as an in-kind transfer.

Consistent throughout all nutrition-sensitive sectors reviewed is the importance of female empowerment. Strong evidence exists which proves that women place greater emphasis on family and child welfare when distributing their food within the household. Empowerment of women through education and change in legislation increases the resources they are able to freely command, thereby increasing flows of nutrition into households and towards their children. The author argues that this would lead to women having a greater influence over domestic decision-making, particularly over culture, four pathways are identified with the clearest being the impact that the quantity and quality of food produced from subsistence farming has on nutrition. Other pathways in the agriculture sector include the impact that more efficient agricultural practices have on lower food prices and therefore on farmers’ incomes. While reduced prices can reduce income for farmers, more efficient agricultural practices can also give them the opportunity to cultivate and sell other crops and generate additional income. Increasing agricultural efficiency will also have a beneficial effect on GDP growth. While the report acknowledges the need to address the social determinants of undernutrition such as gender inequalities, it first proposes interventions addressing the quality of food produced, potentially by providing vitamin-enriched crops to farmers. It also explores the possibility of artificially adjusting food prices to benefit the agricultural sectors of target economies, but notes that an intimate knowledge of the structure of the sector would be required to correctly determine which price adjustments would be beneficial.

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2 Available at: http://www.actionagainsthunger.org.uk/resource-centre/online-library/
3 http://www.actionagainsthunger.org.uk/resource-centre/online-library/
other issues crucial to nutrition such as family planning.

The diagnostic framework consists of a four-step process for agencies, donors or governments to help them to identify nutrition-sensitive interventions which are likely to be most successful in regions where there is most need. The four steps are geographical allocation, sectoral allocation, pathway and determinant allocation, and intervention allocation. In each step, a set of criteria is combined with existing data to determine which geographic area, economic sector, pathway, or intervention is most appropriate.

This is very much a starting point of what should be an ongoing combined research effort. In the coming years, more evidence will accumulate on which interventions are most effective, for which groups and under what conditions. Already we know that the country context is extremely important: interventions that appear to work well in some environments do less well in others. Improving understanding of what the crucial factors are in each case is essential, and this can only be done with a deep and rich understanding of local conditions.

Nutrition has risen rapidly up the international agenda over the past few years. However if we are to capitalise on this opportunity, we need to move away from the abstractions of the drawing board to the messy realities of the real world. A wide range of factors influences nutrition outcomes at different levels. Ensuring an adequate dietary intake and good health are the most immediate determinants, but underpinning these are issues like food security, the care of children and women and access to good quality health services.

Maximising the Impact of Nutrition-Sensitive Interventions stresses the need for nutrition-sensitive interventions to be complementary to more direct actions and requires that they are embraced and their outcomes meticulously studied in accordance with the proposed diagnostic framework. It emphasises the wide-reaching nature of nutrition-sensitive interventions, and recognises that now, more than ever before, there is an opportunity for closer collaboration between nutrition agencies in terms of cooperatively studying outcomes and undertaking complementary projects.

The Scaling Up Nutrition (SUN) movement held its annual Global Gathering in New York in October 2013. Rather than the ‘high-level’ political meetings of previous years, this event brought a range of stakeholders from different countries together to share experiences about what works and under what conditions (43 countries are now signatories to the SUN Framework).

Sharing practical experiences at events such as the SUN Global Gathering or the upcoming ENN Nutrition Technical Meeting (October 2014), is an important part of closer collaboration. If we are to achieve the greatest possible impacts, however, it is essential that we develop mechanisms to translate this growing body of evidence into the most effective interventions on the ground. Only if people in the corridors of power start to systematically utilise this wealth of information, can we save time, resources and lives.

For more information, contact: Samuel Hauenstein Swan, email: s.hauensteinswan@actionagainsthunger.org.uk

En-net update and MAMI thematic area launch

By Tamsin Walters, en-net moderator

Over the period October 2013- Jan 2014, 43 questions have been posted on en-net, along with 166 responses and 48 vacancy announcements.

The Prevention and treatment of severe acute malnutrition forum area received most questions (15) followed by the Assessment and Coverage Assessment areas.

An interesting discussion in the Infant and Young Child Feeding Interventions forum area raised the question of whether wet nursing should be recommended in HIV prevalent areas where replacement feeding is not safe but there is no HIV testing available. Some quite contrasting views were expressed, largely depending on whether respondents are working predominantly in an HIV context or in an emergency one, and the tricky question of how to balance the risk of HIV infection against the risk of significant undernutrition of the infant was discussed, as well as the options available to try to mitigate both risks.

A contribution from WHO suggests that in emergency situations, “the overall balance of risks for HIV-free survival of infant/child is very likely to be in favour of breastfeeding, either by the mother or by a wet nurse, even if their HIV status is unknown. None of these considerations detract from the seriousness of potential HIV transmission through breastfeeding. However, the probability of death from diarrhoea or malnutrition is likely to be higher”. Potential ways to manage the risks are suggested to provide a helpful steer for fieldworkers facing this situation. To read more on this or to join the discussion, go to http://www.en-net.org.uk/question/1218.aspx

A further discussion entitled “Do you think your child is malnourished?” highlighted recent findings that predominant barriers to uptake of CMAM are frequently reported as “lack of knowledge of malnutrition” and lack of knowledge of the CMAM programme available. The discussion sought to examine how better communities can be sensitised around understanding and presenting early problems/growth faltering in their children, as well as how the language of the approach by practitioners might need to change and adapt to the local context, exhibiting a greater cultural understanding of how caregivers view the nutritional status of their children and the appropriate response. “By understanding the concept of growth within the community, one can design better messages for enhancing growth and the uptake of interventions within that community”. To read more or to contribute to the discussion, go to http://www.en-net.org.uk/question/1228.aspx

Finally, we would like to announce the launch of a new thematic area on en-net, Management of acute malnutrition in infants less than 6 months of age. The latest WHO guideline updates on the management of SAM in infants and children (2013) (see news piece in this issue) specifically mentions this age-group for the first time. Inpatient care is recommended for complicated cases and outpatient management for uncomplicated cases. There remains a lack of evidence and detailed guidance on how to identify and intervene with this age-group at community level. This is a priority area of research. In the meantime, we hope that the en-net technical forum will provide a space for practitioners to exchange experiences to inform manageable cases where you are seeing in your programmes. To join any discussion on en-net, share your experience or post a question, visit www.en-net.org.uk

Contributions from Marie McGrath, Nigel Rollins, Cornelia Wakhanu, Lia and Martha Mwangome

Malnourished 3 month old twins in Niger: the field reality behind the launch of the en-net thematic area for this age group
Spreading around the globe: ActivityInfo

By Claire Barnhoorn

Claire Barnhoorn is a graduate from the NOHA MSc Humanitarian Assistance (UCD, Dublin) and currently working at MSF. Besides a long standing interest in (technical) innovations within humanitarian aid, she is passionate about data, measurable M&E and informed decision-making. Previously she was the project leader of ActivityInfo, assisting organisations to operationalise ActivityInfo and in 2012, worked as a UNICEF-Mali consultant to lead the roll out of ActivityInfo for the emergency response.

Location: Global

What we know: Sharing programme data and analyses takes considerable time and resources in humanitarian operations and is complicated. Practical constraints include lack of harmonised units of measure between programmes, multiple data submissions to different users (internal use, sectoral coordinators, donors) and incompatible worksheets.

What this article adds: ActivityInfo is an online/offline, browser-based humanitarian project management and monitoring tool, licensed as open source software. It was developed at field level to simplify reporting and allow for real time monitoring. Its use has spread by ‘word of mouth’ from DRC to Mali, Somalia, Madagascar, South Sudan, Jordan and Lebanon. See: www.activityinfo.org.

Sharing information on activities is a challenge for many among us working in humanitarian aid. Current systems of storing and sharing information are often resource intensive (in terms of time and money) and lead to sub-optimal outcomes in the quality of our programming as a result of data loss, lack of information shared and lack of analysis. Ask any humanitarian programme manager how many hours are spent on reporting, meetings and requests for programme information and the answer will probably easily exceed half of our working hours. Hours not counted are those spent in frustration at incompatible excel sheets, lost macros or different unit of measures when aggregating data. On entering cluster meetings, agency representatives working in humanitarian emergencies often start by calling out numbers, toilets built, MAM/SAM cases admitted, kits distributed or cholera cases found. Hours pass before being able to really analyse the needs, the appropriateness of the response and being able to plan for activities. Another great difficulty often encountered with data is ‘the unit of measure’ since not all involved in a humanitarian response are using the same definition. For example, you can find that one organisation reports toilets being built by block while another organisation reports toilets by door, creating a tough job for information management officers.

The need

In late 2008, UNICEF’s Emergency Unit in the Democratic Republic Congo (DRC) faced the challenges of coordinating two large multi-year, multi-partner programmes. These were the Programme for Expanded Assistance to Returnees (PEAR) and the Rapid Response Mechanism (RRM) which merged into the RRMP (Response Rapide de Movement des Populations)1. UNICEF’s Emergency Unit in the DRC started to work with an information management consultant to address the issues and challenges faced by developing a field-driven tool for monitoring and evaluation (M&E). The requirements were defined by organisations working within RRM and PEAR and were tested through the assignment. Realising that building another excel-based dataseat was not going to solve the real issues, the idea of a new field-driven tool called ActivityInfo was born. From the start, ActivityInfo was built as an open source solution under GPL (General Public Licence), making it possible for the wider humanitarian world to benefit in the future. Furthermore, the software can be adapted and developed as needed.

Development

The first version of ActivityInfo was developed between January and March 2009, and evolved monthly through 2009 in response to user feedback and emerging operational needs. In late 2009, ActivityInfo was adopted as the Non-Food Items (NFI) and Education Clusters’ information management platform in the DRC and in 2010, OCHA began expanding ActivityInfo’s use to the remaining clusters there.

Because ActivityInfo developers were based in eastern DRC throughout 2009, the application has been built from ‘the ground up’, to function well in the most challenging of environments. It is optimised for latency-satellite connections and ready for chaotic IT environments with support for all browsers, and works both on- and off-line. ActivityInfo databases can be created for a project, a mission, a cluster, an operational coordination centre, etc, with different indicator-based activities, and enables monitoring at every level. Database rights can be allocated to specific users with separate logins. Data need only be entered once, since they can be exported to other databases (e.g. to the cluster or funding agency). Development and evolution continues. For exam-

1 www.rrmp.org
2 United Nations Mission in the Republic of South Sudan
3 Syrian Refugee Response Tracking: http://www.syrianrefugeeresponse.org/
Spreading the word
ActivityInfo is now used by more than 300 people from 75 different organisations in the DRC alone, from local Congolese NGOs to large international non-governmental organisations (NGOs) and United Nations (UN) agencies. It has helped many organisations improve decision making by ensuring availability of the most recent data, chronologically and geographically, as well as disaggregated by partner, programme and any possible combination of these. However there has been limited PR or communication carried out by the company behind ActivityInfo; the experiences of individuals and organisations are the driving force behind its use. Staff turnover and rotating rosters of organisations result in the spread of ActivityInfo, with individuals starting to take the tool with them to be implemented in other settings. As an example of this, by 2012 ActivityInfo was rolled out in Malis emergency response by UNICEF. This was followed by a request from Madagascar for the tool to be used in the cyclone response. In 2013, both UNHCR and UNICEF used ActivityInfo as their information management system in the Syria response, operating from Jordan and Lebanon, as well as a roll out for UNMISS starting in South Sudan. UNHCR has currently its own ActivityInfo portal in Jordan, serving as a platform for approx. 300 volunteers to centralise, map and analyse humanitarian activities better. International NGOs are also taking on ActivityInfo, e.g. Mercy Corps has been using ActivityInfo for some years in Somalia. Small local NGOs are also being consulted and equipped with functions, such as being able to produce quality maps without Geographic Information Systems (GIS) expertise and sending out automated custom made reports with graphs and tables using real time information.

ActivityInfo helps lower the burden of reporting and improves informed decision making and programme planning. There has been little research conducted so far on ActivityInfo and its impact on monitoring and ultimately on humanitarian responses, since it has been operating under the radar for most of us, while being developed in field offices. The year 2014 will mark the 5th anniversary of ActivityInfo and might mark a change in this with the recent rapid escalation in its use following roll out in large emergencies (Syria and South Sudan).

For more information, contact Claire Barnhoorn:
email: cmbarnhoorn@gmail.com or BeDataDriven, the company which developed ActivityInfo:
email: activityinfo@bedatadriven.com http://bedatadriven.com/


Thanks to Saul Guerrero, ACF-UK, for preparing this summary

Location: Global
What we know: Mapping of global SAM management requires baseline and consistent data.

What this article adds: A web-based data collection and reporting system for SAM management at national level was developed by UNICEF and Valid International to address existing inconsistencies in data reporting to strengthen mapping. The 2012 mapping reports on the number of countries providing updates, national reporting services, estimated burden of SAM, SAM admissions, quality of SAM treatment, and integration into health services. Recommendations include integration of the UNICEF annual supply forecasting tool into the current online system, and improvement of the quality of performance indicator reporting and trend analysis.

The management of severe acute malnutrition (SAM) is critical for child survival and is a key component of the Scaling Up Nutrition framework for addressing undernutrition. UNICEF is a leading organisation in the scaled-up implementation of community-based management of acute malnutrition (CMAM), providing technical support, capacity building and therapeutic supplies for Ministries of Health and non-governmental organisations (NGO) partners. Monitoring and evaluation of service provision is a significant component of UNICEF’s work.

An initial mapping of countries supported by UNICEF in the area of CMAM was first presented in the ‘Global Mapping Review’ (2010 using 2009 data), followed by the 2011 ‘Global SAM Treatment Update’ in 2011. In order to build on previous efforts to gather baseline data related to SAM management at the national level, in 2012 UNICEF worked with Valid International to gather updated information through a web-based data collection and reporting system.

With a view to addressing previously noted inconsistencies with data reporting, UNICEF’s Nutrition in Emergencies unit undertook a standardisation process for the three main areas where discrepancies were identified: specifically incidence, burden of SAM and SAM treatment coverage. A range of technical experts, United Nations (UN) agencies, and field staff were consulted and the formulas used for the 2012 update are presented in Box 1. The original questionnaire was also refined based on feedback from previous years. The web-based platform enabled data quality checks at data entry, and guidance for each question was expanded. The main findings of the 2012 update are outlined below:

Number of countries implementing services
- Sixty countries in 2012 reported the provision of SAM treatment services in-country. This is consistent with 2011 (61 countries) and represents an increase from 2009 (53 countries). Not all countries were aiming for countrywide scale up.
- Of these 60 countries, the majority reported implementation of both inpatient and outpatient SAM treatment (56 countries), with a limited number reporting implementation of inpatient SAM treatment only (7 countries). Previous mapping exercises in 2009 and 2011 did not differentiate between inpatient and outpatient service provision.

Table 1: Reported annual admissions for SAM treatment by UNICEF region (2009-2012)

<table>
<thead>
<tr>
<th>Region</th>
<th>2009</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESAO</td>
<td>414,412</td>
<td>806,919</td>
<td>890,414</td>
</tr>
<tr>
<td>WCARO</td>
<td>488,366</td>
<td>784,660</td>
<td>1,235,302</td>
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<tr>
<td>ROSA</td>
<td>29,116</td>
<td>207,215</td>
<td>258,366</td>
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<tr>
<td>MENA</td>
<td>64,124</td>
<td>126,647</td>
<td>217,935</td>
</tr>
<tr>
<td>TACRO</td>
<td>0</td>
<td>21,660</td>
<td>28,882</td>
</tr>
<tr>
<td>EAPRO</td>
<td>5,600</td>
<td>12,671</td>
<td>31,813</td>
</tr>
<tr>
<td>Total</td>
<td>1,001,618</td>
<td>1,961,772</td>
<td>2,662,712</td>
</tr>
</tbody>
</table>

EASRO Eastern and Southern Africa Regional Office, WCARO West and Central Africa Office, ROSA South Asia Regional Office, MENA Middle East and Northern Africa Regional Office, TACRO Americas and Caribbean Regional Office EAPRO East Asia and the Pacific Regional Office

National reporting rates
- In total, 25 countries were classified with >75% reporting rate (i.e., they received >75% of the required reports within a given reporting period – monthly or quarterly) in comparison with 29 countries in 2011.
- The slight decline in reporting rates reflects the attempts of the 2012 questionnaire to improve data quality by asking for raw numbers of reports expected and received in 2012, in comparison asking for percentage reporting rates in 2011.
- The proportion of incomplete or absent data indicates the need for continued efforts to improve national reporting systems over time.

Estimated burden of SAM
- The current global figures of SAM burden produced by WHO, UNICEF and the World Bank (2013) estimate that 17.6 million children could be classified with SAM at any point in time. These estimates have their limitations as they do not take into account incidence, nor do they consider oedematous cases of SAM. The 2012 update figures provided national level estimates that help to high-light the need for more precise estimations of the national, regional and global burden.

SAM admissions
- A total of 2,662,712 cases of children aged 6-59 months with SAM were reported as admitted for treatment of SAM in 2012, compared with an estimated 1.96 million reported in 2011 and 1 million in 2009 (See Table 1).
- As the reporting rate from 2011 to 2012 was largely similar (as opposed to a marked improvement from 2009 to 2011), what can be inferred is that the increase in admissions from 2011 to 2012 is due not better
reporting, but more truly reflects the increased number of admissions.

Most admissions for community SAM treatment are located in East/Southern and Central/Eastern Africa. Given the high burden of SAM in South Asia, it is evident that SAM scale up in South Asia could result in significant progress towards meeting the global burden of SAM cases.

Quality of SAM treatment

The three globally agreed performance indicators (recovered, defaulted and died) are routinely collected at a decentralised level to assess quality of SAM treatment. In order to give a more accurate picture of performance indicator rates in 2012, countries were asked to provide raw numbers for death, defaulting and recovery which were then used to calculate performance statistics, as opposed to reporting percentages in previous rounds of data collection. With a focus on recovery and defaulting:

- 30 countries in 2012 achieved a minimum recovered rate of ≥75% (Sphere standard for recovered), representing an increase from 21 countries in 2011.
- 25 countries in 2012 achieved a defaulter rate of ≤15% (Sphere standard for defaulted), representing an increase from 20 countries in 2011.

Challenges were presented with reporting data as raw numbers, with over 42% of the countries (25 countries) unable to report either defaulter or reporting figures. Efforts are required to support countries in the collection/collation of these performance indicators.

Integration into Health Services

Integration of SAM management into national health systems has expanded the geographical coverage of SAM treatment as some ministries of health have adopted SAM management as part of the essential health package (not all countries are aiming for nationwide scale-up).

Some aspects of integration of SAM treatment into health systems were found to be strong with many countries reporting:

- management of SAM incorporated into Maternal and Child Health and Nutrition (MCHN) policies
- at least one SAM indicator in HMIS, and incorporation of SAM into the MCHN service package.

At the same time, many countries reported areas where there was less integration, such as:

- no allocation of funds for SAM in the annual health sector plan
- no national curricula for management of SAM
- Ready to Use Therapeutic Food (RUTF) not on the essential supplies list.

The analysis found no obvious correlation between integration indicators and the levels of treatment or geographic coverage or number of admissions attained by countries. Nevertheless, it is clear that more needs to be done to advocate for an enhanced commitment by governments to SAM management.

Recommendations

Integration of the UNICEF annual supply forecasting tool into the current online system. Whilst harmonised in terms of timing, the supply forecasting exercise and 2012 Global SAM Update are currently two separate data collection processes.

Improvement of the quality of performance indicator reporting and trend analysis. UNICEF and partners are continuing to work with countries to improve SAM reporting using a variety of techniques (national web-based platforms, SMS systems, HMIS integrated reporting etc).

Box 1: Key definitions

Incidence of SAM

An estimate of the incidence of SAM can be calculated as follows:

Incidence = Prevalence/average duration of disease

A common estimate of the average duration of an untreated SAM episode is 7.5 months (Garenne et al. 2009). Using this to estimate incidence over one year (i.e., 12 months) yields:

Incidence = Prevalence x 12/7.5 = Prevalence x 1.6

1.6 is therefore the incidence correction factor for the calculation of incidence from a given prevalence.

Burden of malnutrition

The burden of SAM is defined as an estimation of the total number of SAM cases in a population over a specific period (i.e., prevalent cases + incident cases in the year).

Burden = Population 6-59m x [Prevalence + (Prevalence x 1.6)]

Or simplified to: Burden = Population 6-59m x Prevalence x 2.6

To clarify further:

- Prevalent cases = prevalent SAM x population 6-59m
- Incident cases = prevalent SAM X population 6-59m x 1.6 (where 1.6 is a correction factor which gives incidence as factor of prevalence)

Treatment Coverage

SAM treatment coverage is defined as the proportion of children with SAM who receive therapeutic care. For UNICEF’s 2012 data, this was calculated as follows:

SAM Treatment coverage = Admissions/Population 6-59m x [Prevalence + (Prevalence x 1.6)]

Geographical Coverage

The working definition for geographical coverage used by UNICEF in its 2012 Global SAM Management Update is as follows:

SAM Geographical Coverage = Healthcare facilities delivering treatment for SAM/total number of healthcare facilities

WHO guideline updates on the management of SAM in infants and children

The WHO has released guidance on updated evidence and practices for key interventions in the management of severe acute malnutrition (SAM) in infants and young children. The guideline is intended for a wide audience, including policy-makers, their expert advisers, and technical and programme staff in organisations involved in the design, implementation and scaling-up of nutrition actions for public health. The guideline will form the basis for a revised manual on the management of severe malnutrition for physicians and other senior health workers1, and a training course on the management of severe malnutrition.

This guideline does not reflect all WHO recommendations related to the management of children with SAM but only those related to areas that were prioritised by the guideline development group2. Relevant standing recommendations are included adjacent to updated recommendations, to contextualise updated recommendations. Other WHO recommendations will be addressed in future guideline updates.

Recommendations are made regarding the following:

1. Admission and discharge criteria for children who are 6–59 months of age with SAM
2. Where to manage children with SAM who have oedema
3. Use of antibiotics in the management of children with SAM in outpatient care
4. Vitamin A supplementation in the treatment of children with SAM
5. Therapeutic feeding approaches in the management of SAM in children who are 6–59 months of age
6. Fluid management of children with SAM
7. Management of HIV-infected children with SAM
8. Identifying and managing infants who are less than 6 months of age with SAM

The evidence available for the development of recommendations, was in general of very low quality, due to the limited availability of randomised controlled trials, trials comparing existing WHO recommendations with new treatment options, or trials documenting comparisons of diagnosis and treatment methods identified by the guideline development group as requiring review. Where direct evidence was not available, indirect evidence from different population groups, or different intervention strategies has been noted, if appropriate. The need for future research directly addressing several of the areas of concern was highlighted.

**People affected by conflict: humanitarian needs and numbers**

**Summary of report**

**Location:** Global

**What we know:** Conflict has humanitarian consequences.

**What this article adds:** Analyses of CRED Complex Emergency Database surveys indicate that displaced people and conflict affected residents are most adversely affected by conflict in terms of health and nutrition. Refugees have the lowest death rates and least bad nutrition/health indicators. National health data are unreliable guides to the health needs of people affected by conflict. Measles vaccination coverage is below target in most conflict affected populations, acute malnutrition is increasing and mortality is falling.

According to a recent report by Centre for Research on the Epidemiology of Disasters (CRED), malnutrition is increasing and mortality is falling. In 2012, it estimates that more than 172 million people were affected by conflict worldwide. Of this total, 149 million or 87% were conflict-affected residents (CARs). Internally displaced persons (IDPs) accounted for another 18 million and refugees for five million.

Pakistan and Nigeria had the largest numbers of PAC – at 28 million and nearly 19 million respectively – while Libya and Somalia had the largest proportion of their populations affected by violence and insecurity, at around 90% each.

Detailed analyses of CE-DAT surveys demonstrate that an individual’s health is directly related to their status as a CAR, IDP or refugee. IDPs suffer the worst health impacts of conflict. They and their children are almost twice as likely as refugees to die from conflict-related causes, particularly disease and starvation. IDPs also suffer the highest rates of acute malnutrition and are half as likely as refugees to be immunised against measles.

CAR adults and children suffer significantly higher death rates than refugees, and significantly higher acute malnutrition too. They have equally poor immunization rates to IDPs.

Refugees have the lowest death rates of all three PAC groups. They also have the lowest rates of acute malnutrition and the highest level of immunisation against measles.

The report recommends that IDPs should be a higher priority for the humanitarian community and that the specific health needs of CARs should not be overlooked.

CE-DAT surveys demonstrate that national health data are unreliable guides to the health needs of PAC. The three basic indicators of health (mortality, malnutrition and measles vaccination) are rarely the same for national and conflict affected populations.

Looking at PAC health indicators, rather than national data, also changes the ranking of countries by need. Yemen, for example, jumped from 10th place to the top of our list when the focus was PAC child mortality, rather than national death rates. For childhood malnutrition, Djibouti rose to second place from 11th, while Kenya climbed ten places.

For all these reasons, the report suggests that needs-based decision-making about humanitarian aid should not be based on national estimates of mortality or malnutrition. Small-scale surveys are a better source of timely and accurate information. Better use of this data resource should be made for needs assessment and funding appeals.

Causes of death in young children are overwhelmingly from preventable causes, including measles, diarrhoea, malaria, respiratory and other infectious diseases, plus malnutrition. Acute malnutrition is a growing problem in conflict-affected countries. DAT surveys show measles vaccine coverage is below the UNHCR target in every surveyed country except Kenya. To some extent, mortality is under control in most conflict-affected countries. While the report cannot give a full account why death rates are falling, it may be due to a lower intensity of conflicts that were of greatest concern a decade ago. Somalia is a notable exception.

A report by the Coverage Monitoring Network (CMN), the first in a three part series, offers a comparative assessment of the performance and effectiveness of the community-based model during two distinct periods of its development: from 2001-2006 when the majority of community-based treatment projects were implemented by non-governmental organisations (NGOs); and from 2007-2013 when many community-based treatment programmes were integrated by ministries of health (MoH) into regular health services. For each period, three components of the community-based treatment model are assessed: the capacity of treatment services cure SAM cases successfully, their capacity to reach the highest proportion of the affected population (coverage) and their cost-effectiveness.

The report has three main conclusions:

- **Community-based treatment models deliver exceptional clinical outcomes.** The median cure rates of community based models in the 2001-2006 and 2007-2013 periods were 80% and 84% respectively. SAM cases admitted into treatment services today are as likely to be successfully cured today as they were a decade ago.

- **In areas where SAM services are available, only a third of affected cases actually access treatment.** The analysis shows that whilst high coverage can be achieved by community-based SAM treatment, the conditions necessary to do so are seldom met. The capacity of treatment services to meet global SAM needs depends on coverage being significantly and consistently improved.

- **Community-based models are more cost-effective than in-patient models.** Cost-effectiveness analyses show that some community-based models were two times more cost effective than in-patient models. In spite of their dependency on context-specific operational factors, recent evidence suggests that MoH delivered community-based SAM treatment services continue to be cost-effective interventions.

Volume two of this three-part series will look more closely at the issues affecting the coverage of community-based SAM treatment services and will ask what prevents SAM cases from reaching treatment services. Volume three will explore possible programmatic and policy changes to make SAM treatment more accessible and will ask what we can learn from other public health interventions about overcoming these barriers.


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2. The Complex Emergency Database (CE-DAT) was launched within the SMART initiative and has been developed and is run by CRED at the Catholic University of Louvain. It is an international initiative to monitor and evaluate the health status of populations affected by complex emergencies. The database focuses on mortality and acute malnutrition – the most commonly used public health indicators of the severity of a humanitarian crisis. CE-DAT currently contains more than 3,300 epidemiological surveys from 51 countries.
The state of global SAM management coverage 2012

Summary of report

Thanks to Saul Guerrero, ACF-UK, for preparing this summary

**Location: Global**

**What we know:** Geographical coverage and treatment coverage are needed to evaluate SAM management coverage. These can be directly or indirectly measured.

**What this article adds:** The 2012 Global SAM Management Update found improved reporting on geographical coverage (49 out of 60 countries) and most (86.6%) were able to report treatment coverage using indirect national estimates. Only 14 countries out of the 60 in 2012 were aiming for country-wide scale up.

Indications are that indirect national estimates are overestimating achieved treatment coverage and give no indication of variation in coverage. Direct coverage surveys have advantages in this regard but limitations too. Other factors (barriers) influence SAM service update.

Geographical coverage results by country are presented in Figure 1. The fact that the large majority of countries reported such data is a positive indication of improved reporting and understanding compared to 2011. Nevertheless, although a large majority of countries reported national level geographical coverage data, an improvement in reporting does not guarantee the representativeness and accuracy of such data.

First, national averages provide little information on sub-national variations, which in countries with uneven or localised distribution of SAM prevents a more in depth understanding of whether services are in the right location to meet needs. Secondly, defining geographical coverage based on health care facilities has limitations in terms of providing a deeper understanding of the catchment area of these facilities (i.e. spatial distribution, number of households/individuals per facility/quality of health services and physical proximity).

**Geographical coverage in 2012**

- Results from the 2012 Global SAM Management Update indicate that in 2012, 81.7% of countries (49 of 60) were able to report geographical coverage estimates.
- Of these 49 countries, 22 (36.7%) countries reported geographical coverage of <25%, 8 (13.3%) countries reported geographical coverage 25-50%, 3 (5%) countries reported geographical coverage 50-75% and 16 (26.7%) countries reported coverage >75%.

Geographical coverage results by country are presented in Figure 1. The fact that the large majority of countries reported such data is a positive indication of improved reporting and understanding compared to 2011. Nevertheless, although a large majority of countries reported national level geographical coverage data, an improvement in reporting does not guarantee the representativeness and accuracy of such data.

First, national averages provide little information on sub-national variations, which in countries with uneven or localised distribution of SAM prevents a more in depth understanding of whether services are in the right location to meet needs. Secondly, defining geographical coverage based on health care facilities has limitations in terms of providing a deeper understanding of the catchment area of these facilities (i.e. spatial distribution, number of households/individuals per facility/quality of health services and physical proximity).

**Treatment coverage in 2012**

- The 2012 Global SAM Management Update reported that 86.6% (52 of 60) of countries were able to report treatment coverage using indirect national estimates. The eight countries that did not report lacked SAM admission data.
- Of the 60 countries that reported nutrition data in 2012, 8 (13%) did not report treatment coverage, 28 (47%) reported coverage under 25%, 9 (15%) reported coverage 25-50%, 8 (13%) reported coverage 50-75% and 7 (12%) reported coverage over 75% (see Figure 2).

It is important to note that only 14 countries out of the 60 in 2012 were aiming for country-wide scale up (75-100% SAM service provision); however, the results presented below are all national coverage estimates. Therefore for 38 countries where the programmes were not aiming to reach across the whole country, the national coverage rates do not accurately reflect the coverage of the programmes against their programme objectives, since the results are sub-national measured against a national burden denominator. This is important for contextually assessing the coverage rates achieved. Furthermore, the coverage percentages do not necessarily reflect the strong achievements of the programmes in terms of the high numbers of admissions treated (for many countries in the tens or hundreds of thousands), nor the progress made against the programmes’ targets, which are set in relation to the capacity in place and the funding available.

- The proportion of countries reporting treatment coverage <25% is high (47%). This is particularly important considering that treatment coverage derived indirectly produces (significant) overestimations. This means that the actual number of countries with treatment coverage <25% is likely to be higher.
- Many of these countries reporting <25% coverage are also ‘high burden countries’. The 28 countries reporting treatment coverage <25% contain almost 85% of the estimated global SAM burden.

The representativeness of these indirect estimates are however problematic; indirect national estimates provide no information about the spatial distribution of coverage (high and low coverage areas) but instead offer an average estimate which may not be representative of any sub-national area.

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1 Available at http://reliefweb.int/report/world/state-global-sam-management-coverage-2012
2 SAM geographical coverage definition = Health care facilities delivering treatment for SAM
3 SAM treatment coverage definition = total number of health care facilities
4 For other key definitions, see UNICEF global SAM management update (2012) news piece in this issue of Field Exchange (47).
Comparing indirect and direct treatment coverage

Discrepancies are evident between national level indirect estimates and sub-national direct estimates (provided by assessments compiled by the Coverage Monitoring Network) of treatment coverage. This suggests that indirect national estimates are overestimating the levels of treatment coverage which are being achieved. One of the challenges with the accuracy of indirect estimation lies with the calculation of the denominator (‘SAM burden’). This is due to: (1) often unavailable up-to-date census data to define the national under-five population (2) Prevalence data not being based on census data to define the national under-five population. This is due to: (1) often unavailable up-to-date seasonal data (2) Prevalence data not being based on census data to define the national under-five population.

In an effort to address some of the challenges from indirect methods, direct methods for estimating SAM coverage at the national and sub-national level have been developed in recent years. Direct coverage surveys within the appropriate context provide a different lens to coverage estimation, being better suited to indicate coverage with more precision at a particular point in time than the indirect method. Nevertheless, there are also challenges around using these direct survey methodologies. Direct methods are commonly used at the sub-national level, but their use in estimating national SAM coverage remains limited. The limited use of direct estimations at a national level remains a significant barrier to gaining a reliable understanding of SAM coverage.

Assessing the bottlenecks

Availability of services (geographical coverage) does not equate with service access and uptake (treatment coverage). There are many other factors which positively and negatively influence uptake and success of SAM management. The data from sub-national coverage assessments compiled by the Coverage Monitoring Network provides some insight into barriers which influence attendance at SAM treatment services (Figure 3).

- Distance is a major barrier to access thereby affecting coverage. Geographical coverage does not imply equitable and widespread access.
- Awareness (of both the programme/services and of the need for clinical treatment) is another major barrier which is also linked to access. Community sensitisation and awareness raising is vital to ensure access and uptake of SAM treatment. Yet, the large catchment areas of health facilities combined with limited resources for these activities means that awareness about available services often remains limited.
- Availability and awareness can foster access, but both service uptake and compliance with treatment (low defaulting) are intrinsically linked to the opportunity costs associated with SAM treatment. Whilst the introduction of community based SAM treatment services has significantly decreased opportunity costs, there is a growing body of evidence that suggests that delivering optimal coverage requires further measures to reduce such costs.

Recommendations

Strengthen routine SAM management data. Enhanced availability and quality of nutrition information is essential for a better understanding of needs (the burden of SAM) and to strengthen programming.

Review and consolidate the definition of geographical coverage. Two main revisions to this definition used in annual reporting should be reviewed and consolidated. First, the way health-care facilities are classified must be reviewed. Secondly, the current (facility-based) definition should be reviewed and expanded to capture the level of availability and equity of access.

Improving estimates of treatment coverage. A twin track approach is required to continue to strengthen understanding and estimation of coverage. Improved routine data will enable more accurate estimations around programme coverage and quality. At the same time, efforts must be made to refine and strengthen, promote, finance and support the use of adequate methodologies for direct treatment coverage estimation. In the short term, there should be efforts to strengthen the evidence base. In the mid-term, a technical and operational framework for supporting national coverage surveys needs to be developed. In the long term, there should be efforts to integrate SAM coverage estimation into national nutrition/health assessments.
What we know now: a decade of community-based SAM treatment

In 2010, a group of nutrition organisations (ACF, Save the Children, Concern Worldwide, International Medical Corps, Helen Keller International and Valid International) came together to create the Coverage Monitoring Network (CMN), aiming to increase the capacity of nutrition programmes to assess their treatment coverage and to understand the main barriers and boosters to access. The CMN championed the use of coverage as a proxy measure of the health and robustness of severe acute malnutrition (SAM) treatment services and in measuring it, the CMN started to provide a picture of the quality of SAM treatment services today.

One of the stated objectives of the CMN project was to build on this growing evidence, creating spaces in which trends are reviewed, common barriers are identified and assessed, and lessons can be learned, through the implementation of coverage assessments around the world. To do so, however, the project would need to go beyond coverage and explore the factors influencing it. This realisation led the CMN to open these learning spaces to the review of emerging lessons on SAM treatment as a whole.

The first of such events took place in London on October 17th and 18th, 2013, as a co-sponsored event between the CMN, UNICEF, the CMAM Forum and World Vision. Under the title “What We Know Now: A Decade of Community-based SAM Treatment”, the conference brought together over 170 academics, practitioners and policy-makers from a range of non-governmental organisations (NGOs), United Nations (UN) agencies, academic institutions and national governments. What began as a simple ‘lessons learned’ exercise rapidly grew into a broad review of the state of SAM treatment today, and the start of a process to identify key areas for future action.

At the end of the two-day conference, a series of priority areas were identified, divided in seven different streams (Institutional Architecture, Financing, Government, Supply Chain, Treatment, Nutrition Information and Community, Access & Demand). In the weeks following the conference, partners continued to refine these areas of future work and began making specific commitments to contribute to their development and implementation. The conference was thus the beginning of a process to strengthen SAM treatment through prioritisation and coordination of efforts by the international humanitarian community.


For more information, contact: Jose Luis Alvarez, ACF, email: j.alvarez@actionagainsthunger.org.uk

Distance learning courses on reducing maternal anaemia, child anaemia and stunting

World Vision International is offering facilitated, distance learning courses on Reducing Maternal Anaemia (5 weeks), Reducing Childhood Anaemia (9 weeks), and Reducing Stunting.

The courses are designed particularly for development workers (from various sectors), as well as other interested learners. The courses include practical field assignments and promote interactive learning through discussion forums with peer learners around the world, as well as an expert facilitator in multi-sectoral programming for nutrition.

Reducing Maternal Anaemia (RMA): This five-week on-the-job training course (with a one-week study break) helps learners understand what maternal anaemia is, its multiple causes and how to prevent it with practical field assignments and expert facilitation.

Reducing Childhood Anaemia (RCA): This nine-week ‘on-the-job’ training course (with a one-week study break) expands on the maternal anaemia course. It focuses on understanding childhood anaemia and how to address this issue in the community.

Reducing Childhood Stunting: Part 1 of this ‘on-the-job’ training course is a four-week introduction to childhood stunting, which explores how every sector contributes to the reduction of stunting via different pathways. Part 2 is an eight-week course (with a one-week study break) on nutrition-specific interventions along the life cycle that help to prevent childhood stunting.

The next course World Vision International distance learning course is on reducing maternal anaemia and will run 19 May–27 Jun 2014 (study week 2–6 Jun). The fee is $450 USD per course but is free for first-time users.

For more information, contact Carmen Tse (course administrator), email: carmen_tse@worldvision.ca

Courses offered March – June 2014

<table>
<thead>
<tr>
<th>Course</th>
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<th>Dates</th>
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<tr>
<td>RCA</td>
<td>9 weeks + study week/holiday week</td>
<td>14 Mar 2014</td>
<td>17 Mar–30 May 2014 (study week/holiday 14–24 Apr)</td>
</tr>
<tr>
<td>RMA</td>
<td>5 weeks + study week</td>
<td>6 May 14 2014</td>
<td>19 May–27 Jun 2014 (study week 2–6 Jun)</td>
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Cassava Cyanide Diseases & Neurolathyrism Newsletter

Cassava Cyanide Diseases & Neurolathyrism (CCDN) News is a six monthly print and online newsletter produced by the CCDN Network. Coordinated by Professor Fernand Lambein of Ghent University, it is a free worldwide network of >700 members and has an international expert editorial board and key country contacts in Cameroon, Democratic Republic of Congo, Indonesia, Mozambique and Nigeria. Over 700 individuals in a wide variety of disciplines from some 60 countries have engaged CCDN Network.

The latest newsletter (No 22, Dec 2013) summarises key research and reports and welcomes topical submissions of short articles and letters.

All newsletters are available at: http://www.ugent.be/we/genetics/ipbo/en/networking/ccdn/newsletters.htm

For more information, contact Professor Fernand Lambein, CCDN Coordinator, Ghent University, Belgium, email: fernand.lambein@gmail.com

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Upcoming IFPRI conference on building resilience for food and nutrition security

The IFPRI 2020 Conference, planned for May 15-17, 2014 in Addis Ababa, Ethiopia, will bring together policymakers, practitioners, and scholars to discuss how resilience can be strengthened for food and nutrition security. The conference will:

- Articulate an intellectual framework for resilience
- Identify key emerging shocks that pose the biggest threats to food and nutrition security, where resilience needs to be significantly strengthened
- Assess experiences through case studies and draw out lessons from programmes, policies, institutions, and investments around the world
- Identify key approaches and tools to build resilience to shocks
- Set priorities for action by different actors and in different regions, and
- Identify knowledge and action gaps

in research, policy and programming that need to be met or scaled up in order to successfully build resilience to food and nutrition insecurity.

Attendees will represent food and nutrition security, agriculture, humanitarian and related development sectors, as well as actors from government, the private sector, non-governmental organisations, donors and academia.

The three-day conference will feature a programme of keynote speakers, chaired plenary and parallel sessions, side events, and an interactive Knowledge Fair showcasing the latest on-the-ground initiatives on resilience for food and nutrition security.

Participation in the conference is by invitation only. There is no registration fee.

More information is available at: http://www.2020resilience.ifpri.info/

Story telling needs words and pictures

About half a dozen of our images that feature in this edition of Field Exchange are the work of Samuel Hauenstein Swan, who has kindly allowed ENN to use them. You might have spotted him also as co-author on an article for nutrition in his technical role at ACF International. Samuel is an independent photographer and researcher on humanitarian issues for over two decades. His story-telling strives to explore individual experience of living through crisis and show the resilience of communities faced with disasters. Having published extensively on emergencies and development, his documentary photography and participatory analysis go hand in hand, reinforcing each other to maximise policy and advocacy impact.

Samuel’s work has been published by Médecins Sans Frontières, Action Against Hunger, United Nations, Tearfund, the Department for International Development (UK) and others. His Haiti work was selected for the Summershow 2011 by Fotó8 and rewarded third place at Pink Lady® Food Photographer of the Year.

View Samuel’s work at http://www.sambronx-photo.ch/

The ENN will host a 3 day technical meeting on nutrition in Oxford, UK, from 7th – 9th October 2014. The aim of the meeting is to facilitate technical learning and networking on nutrition specific and nutrition sensitive programming in emergencies and high burden contexts, to inform better practice, research priorities and advocacy. The meeting will engage a broad audience that includes non-governmental organisations (NGOs), United Nations (UN) agencies, the Scaling Up Nutrition (SUN) movement, the Global Nutrition Cluster (GNC), academia, bilateral and multilateral donors, the private sector and government representatives. Current funders for the meeting are OFDA, Irish Aid, ACF, UNHCR, Concern Worldwide and World Vision.

The objectives of the meeting are:

a) To give participants the opportunity to present their work, highlight lessons, and share experiences from cutting edge/innovative and new areas of research and programming.

b) To give participants the opportunity to identify and discuss critical gaps and unanswered questions in relation to research and programming, with peers from the wider nutrition community and related sectors.

c) To provide participants with the space to discuss how collectively to move forward in certain key technical and programmatic areas and to allow current working steering groups in the sector to convene and allow formation of new groups, as necessary.

d) To strengthen donor and academic understanding of operational challenges both within the sector and in cross-sectoral work streams.

Process

The lead organiser is the ENN, supported by a Steering Committee (SC) and an Advisory Group (AG), made up from individuals representing key organisations, institutions and academia. The main role of the SC is to support the organisation of the meeting by helping to guide the agenda development, meeting structure, process and participants profile. The Advisory Group (AG) will represent other sectors involved in nutrition sensitive research, policy and programmes such as health, water, sanitation and hygiene (WASH), livelihoods, education, shelter and social protection. Cross sectoral issues such as gender and governance will also be represented. Both the SC and AG will help identify specific themes/topical areas for the meeting.

Meeting format

The meeting will use formal and less formal approaches to present, share and discuss research and programming, which include:

- Plenary presentations
- Parallel meeting presentations
- ‘Market place’ presentations
- Panel Q & A discussions
- Active networking
- Space and bookings for pre-identified side meetings (which in some cases may be by invitation only)

The meeting is by invite only. Invitations and a call for abstracts will be issued within the next two months. For more information, please contact Emily Mates, ENN, email: emily@ennonline.net

Programmes whose primary objectives are not specific to nutrition but have the potential for nutrition impact.
Globally, cash payments to poor people from governments, aid agencies or the private sector are in the order of magnitude of billions. Meanwhile, the rapid spread of technologies enabling branchless banking and digital payment systems has supported the increased consideration of electronic transfers (e-transfers) by aid agencies. Over the last five years alone, the Cash Learning Partnership (CaLP) recorded 41 e-transfer programmes worldwide targeted at over 3.3 million beneficiaries in emergency settings.

In 2011, the Cash Learning Partnership (CaLP) commissioned a report to investigate the benefits and barriers to using new technologies in humanitarian cash programmes. Building on this, in 2013, CaLP launched a research initiative focused exclusively on e-transfers to build evidence and capacity to develop standards and tools for the humanitarian sector. Specifically this work will result in three publications that will provide guidance on e-transfer programme implementation, an analysis of the cost effectiveness of e-transfers compared to manual cash transfers, and beneficiary data protection advice.

Two of these publications, E-transfers in Emergencies: Implementation Support Guidelines and Principles and operational standards for the secure use of personal data in cash and e-transfer programmes have been released.

E-transfers in emergencies guidelines

The guidelines are intended for field practitioners of aid agencies engaged in humanitarian responses incorporating cash transfers to be delivered through digital payment systems, as well as their extended teams in management and programme support functions.

Internal agency guidelines and procedures do not always include specific guidance on the use of e-transfers and the engagement of the private sector. The CaLP guidelines thus seek to provide a basic understanding of e-transfer systems, propose a framework for evaluating the wealth of options available and offer guidance on how to use these options in the delivery of humanitarian assistance.

The guidelines assume prior knowledge of cash transfer programming and focus exclusively on implementing e-transfers; they do not elaborate on decisions relating to whether or not cash is a viable programme option. Therefore, the programme lifecycle begins with assessing which e-transfer option is best suited to deliver a given cash-based intervention. For readers seeking more in-depth information on cash transfer programme management in general, a guidance sheet on cash transfer reference documents in provided. Extensive additional material is also available on the CaLP website (www.cashlearning.org).

Principles and operational standards guidelines

These guidelines aim to enable agencies to meet and respect these international standards and in particular to address risks inherent in the use of beneficiary data by agencies engaged in the delivery of cash, with a specific focus on e-transfer programmes. Annexes include a model privacy impact assessment and model clauses for contracts with third parties.

Feedback

The CaLP is keen to receive feedback from the use of these guidelines. Organizations are invited to send their thoughts and share their programme experiences at info@cashlearning.org and join the CaLP discussion group (by using the link on website www.cashlearning.org).

These guidelines, together with many other cash-related resources, are available on the CaLP website, http://www.cashlearning.org/.

WHO Guideline: Nutritional care and support for patients with TB

Undernutrition increases the risk of tuberculosis (TB) and in turn TB can lead to malnutrition. Undernutrition is therefore highly prevalent among people with TB. It has been demonstrated that undernutrition is a risk factor for progression from TB infection to active TB disease and that undernutrition at the time of diagnosis of active TB is a predictor of increased risk of death and TB relapse. However, the evidence concerning the effect of nutritional supplementation on TB prevention and health outcomes among people with TB had not previously been systematically reviewed.

WHO has recently produced a guideline on the principles and recommendations for nutritional care and support of patients with TB as part of their regular TB care. Of note, it does not consider the provision of food as part of a package of enablers to improve TB treatment adherence or as means to mitigate the negative financial consequences of TB.

The primary audience for the guideline is health workers providing care to people with TB. However, the guideline is also intended for a wider audience, including policy-makers, their expert advisers, and technical and programme staff at organisations involved in the design, implementation and scaling-up of nutrition actions for public health.

Three systematic reviews were updated to inform this guideline. The overall evidence base on effects of nutritional supplements for TB prevention and care is limited and the overall quality is low or very low for most outcomes. There is no evidence on improvement of TB treatment outcomes, or prevention of progression from TB infection to active disease, of using nutritional supplementation as an addition to standard care. There is no evidence that nutritional management of acute malnutrition of patients with active TB should be different than for those without active TB.

Principles

Five guiding principles are identified as key for providing nutritional care and support as an integral part of TB care and prevention:

1. All people with active TB should receive TB diagnosis, treatment and care according to WHO guidelines and international standards of care. When malnutrition is identified at the time of TB diagnosis, TB is considered a key causal factor that needs to be addressed. It is essential that nutrition assessment and assistance do not divert resources from optimal TB diagnosis and care.

Concerns about weight loss or failure to gain weight during TB treatment should trigger further clinical assessment (e.g. resistance to TB drugs, poor adherence, comorbid conditions) and nutrition assessment of the causes of undernutrition, in order to determine the most appropriate interventions.

2. An adequate diet, containing all essential macro- and micronutrients, is necessary for the well-being and health of all people, including those with TB infection or TB disease.

3. Because of the clear bidirectional causal link between undernutrition and active TB, nutrition screening, assessment and management are integral components of TB treatment and care.

4. Poverty and food insecurity are both causes and consequences of TB, and those involved in TB care therefore play an important role in recognising and addressing these wider socioeconomic issues.

5. TB is commonly accompanied by comorbidities such as HIV, diabetes mellitus, smoking and alcohol or substance abuse, which have their own nutritional implications, and these should be fully considered during nutrition screening, assessment and counselling.

Recommendations

Patients with TB should be nutritionally assessed and receive the same nutritional care and support as other individuals or populations of similar nutritional status, in agreement with all relevant WHO recommendations.

The WHO guideline recommendations are grouped on four areas related to nutritional care and support – nutrition assessment and counselling, management of SAM, management of MAM, and micronutrient supplementation – to cover especially vulnerable populations, with an additional area for contact investigation.

Closer nutritional monitoring and earlier initiation of nutrition support (before the first two months of TB treatment are completed) should be considered if the nutritional indicator is approaching the cut-off value for a diagnosis of severe undernutrition.

Research priorities

Guideline group members and stakeholders identified several research priorities to improve the body of evidence at the basic, clinical, epidemiological and operational levels, on the nutritional care and support for patients with TB.

A proposal for a simplified and structured approach

By Ernest Guevarra (VALID International), Katja Siling (VALID International), Faraja Chiwile (UNICEF Sierra Leone), Mueni Mutunga (UNICEF Sierra Leone UNICEF Sudan), Joseph Senesie (UNICEF Sierra Leone), Walton Beekley (UNICEF Sierra Leone), Hamidine Hassane (UNICEF Niger), Massaoud Williams (Niger National Institute of Statistics), Kazim Lamine (Niger National Institute of Statistics), Mara Nyavo (UNICEF Sudan), Farah Mohamed Ibrahim (UNICEF Sudan), Masresha Tessema Anegago (EHNRI), Tesfaye Hailu Bekele (EHNRI), Gezahegn Shimelis Tadesse (Concern), Adane Tefera Beyene (Concern), Pankaj Kumar (Concern), Grant J Aaron (GAIN), and Mark Myatt (Brixton Health)

This article describes an approach to assessing infant and young child feeding (IYCF) practices using small-sample surveys which was developed jointly by VALID International; CONCERN Worldwide; Save the Children; UNICEF in Sierra Leone, Niger, and Sudan; the Sierra Leone Ministry of Health and Sanitation; the Niger National Institute of Statistics; the Ethiopian Health and Nutrition Research Institute (EHNRI); the Sudanese Federal Ministry of Health; the Global Alliance for improved Nutrition (GAIN), and Brixton Health. It is, in large part, a development of earlier work undertaken by the International Food Policy Research Institute (IFPRI) and the Food and Nutrition Technical Assistance (FANTA) project.

The purpose of this document is to describe ongoing work and to propose a structured approach for IYCF indicators suited for use in small-sample surveys (i.e. sample sizes similar to or smaller than the n = 210 used in EPI vaccine coverage survey).

We have attempted to address problems that we have experienced using the set of IYCF indicators that have been proposed by the WHO. We do not believe that we have all the answers. We will have got some things wrong. Our intention is to let the emergency nutrition community know what we have been doing in the hope that our mistakes can be corrected and our work improved.

The statements in this publication are the views of the author(s) and do not necessarily reflect the policies or the views of UNICEF.

Location: Global

What we know: There is increasing demand to assess IYCF practice in communities to inform programming design and monitor impact. Standard WHO IYCF indicators exist that require sample sizes not achievable in many programme areas.

What this article adds: An approach has been used in Sierra Leone, Niger and Sudan to assess IYCF practices using small-sample surveys. It produces a principle composite IYCF indicator to classify IYCF practice as ‘good’ or ‘not good’ amongst 0-23 month old children. A set of diagnostic indicators is also calculated. The sample sizes used are 210 children or less.

The precision achieved was similar to that achieved by a typical EPI vaccine coverage survey. Field teams have found the approach user friendly, efficient and cost effective. There are limitations; for example, the data collection method is a simplified version of WHO methodology that has not been validated. The authors welcome feedback to develop this work to address an important gap area.

The problem

A set of IYCF indicators has been proposed by the WHO for the population level assessment of IYCF practices1,2. The proposed indicators are intended for use with large-sample surveys (e.g. MICS, DHS) and are not suited to monitoring and evaluating sub-national (i.e. regional, district, and sub-district) programs using small-sample surveys3. In our experience, there are problems with operationalising the indicators proposed by the WHO:

1. The indicator set lacks a clear structure or hierarchy. An overall indicator is not present and there is no clear procedure or guidance for interpreting the set of indicators as a whole.
2. Some of the indicators have very complicated definitions. Box 1, for example, shows a particularly complicated example (Indicator 7: Minimum acceptable diet). The WHO documentation notes:

   ....the calculation......appears cumbersome. However, most users will be processing data using computer software, which simplifies the calculation process'.

We are, however, unaware of software that performs the required calculation in a simple and standardised manner. This functionality is not present in commonly used survey software such as ENA for SMART. It is not present, without additional programming by the user, in any statistical package.
3. Many of the proposed indicators are unsuited to use with small samples. Indicator 4 (Introduction of solid, semi-solid or soft foods), for example, uses data collected for children aged between 6 and 8 months only. If, for example, we were estimating this indicator using data arising from a SMART survey with a sample size of n = 544 (i.e. the largest sample size mentioned in the SMART manual) then this indicator will be estimated using a sample size of about:

   \[ n \approx 8 - \frac{6 + 1}{59 - 6 + 1} \times 544 = 30 \]

   The most commonly used SMART sample design means that the effective sample size (i.e. after accounting for survey design effects) will likely be smaller than this. A sample size of n = 30 is too small a sample size to provide an estimate with useful precision. Accurate and reliable classifications may be possible using sequential sampling techniques (e.g. LQAS) but no guidance is given regarding suitable class thresholds.

This sample size problem means that many of the indicators proposed by the WHO are not suited for use with small-sample surveys or indicator mapping methods. The key document in which these indicators are defined cautions:
... the sample sizes used in monitoring and evaluation of smaller scale programs may be quite small, some of the recommended indicators may be too imprecise to be of use in assessment or in monitoring change for these programs. This is particularly likely for indicators with narrow age ranges in the numerator and the denominator.

This is the case with six (from fifteen) of the indicators proposed by the WHO. The problem that we have tried to address in the work reported here is to create a simple, highly structured, and usefully comprehensive IYCF indicator set that can be used with small sample sizes.

### The single indicator approach

The approach we have used is to produce a single indicator:

**Percentage of children aged between 0 and 23 months receiving good infant and young child feeding**

with “good infant and young child feeding” defined as exclusive breastfeeding in children aged under six months and as age-appropriate feeding practices (defined in terms of continued breastfeeding, dietary diversity, and meal frequency) in older children.

Age-appropriate feeding practice in older children is measured using an infant and child feeding index (ICFI) derived from the index devised by Mary Arimond, Marie Ruel, and Purmina Menon of the International Food Policy Research Institute (IFPRI) and subsequently developed by IFPRI and the Food and Nutrition Technical Assistance (FANTA) project as a Knowledge-Practices-Coverage KPC2000+ indicator 

The principal IYCF indicator is calculated from the counts of children found in the cells of a two-by-two table:

\[ \text{ICFI} = \text{Breastfeeding} + \text{Dietary Diversity} + \text{Meal Frequency} \]

using age-specific weightings (see Table 1) for each term. All children aged between six and twenty-four months receive a score between zero and six. Children receiving a score of six are classified as receiving good infant and young child feeding. The scores given in Table 1 are presented as suggested values and should be subject to further review.

If the survey sample does not include children aged between zero and six months, as might be the case in a nutritional anthropometry survey (e.g. SMART) without a “top-up” sample of children aged below six months, then the ICFI score may still be used. The sample size used for the ICFI in a SMART survey with a sample size of \( n = 544 \) will be about:

\[ n = \frac{23 - 6 + 1}{59 - 6 + 1} \times 544 = 180 \]

Which is large enough to detect small changes in mean ICFI scores between survey rounds as well as to estimate proportions with useful precision (i.e. with 95% confidence intervals of better than about ±10%). This enables (e.g.) periodic SMART surveys to be of use in assessment or in monitoring change for IYCF programs.

The single indicator approach aids decision making by focussing attention on the overall program aim of improving IYCF practices.

### Sample size and precision

#### Table 3: Sample sizes and precision for principal and diagnostic indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>RAM type survey*</th>
<th>SMART type survey*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>% GOOD</strong></td>
<td>192</td>
<td>180</td>
</tr>
<tr>
<td><strong>EBF</strong></td>
<td>48%</td>
<td>11.86%</td>
</tr>
<tr>
<td><strong>ICFI = 6</strong></td>
<td>144</td>
<td>10.12%</td>
</tr>
<tr>
<td><strong>Mean ICFI score</strong></td>
<td>144</td>
<td>0.32</td>
</tr>
<tr>
<td><strong>Continued breastfeeding</strong></td>
<td>144</td>
<td>8.15%</td>
</tr>
<tr>
<td><strong>Dietary diversity</strong></td>
<td>144</td>
<td>12.45%</td>
</tr>
<tr>
<td><strong>Meal frequency</strong></td>
<td>144</td>
<td>11.90%</td>
</tr>
</tbody>
</table>

1 Results from 15 surveys with a sample size of \( n = 192 \) from \( m = 16 \) clusters
2 Assuming \( n = 544 \) children aged 6 – 59 months with a design effect of 1.5 using expected levels from 15 SMART type surveys
3 Half-width of 95% confidence interval (observed mean from fifteen RAM surveys, expected precision for SMART survey)
4 Assumes a sample size of \( n = 544 \) children aged 6 – 59 months and a uniform age-distribution
5 Approximately one-quarter of the sample will be aged 0 – 5 months
6 No children aged 0 – 5 months in the SMART sample
7 Approximately three-quarters of the sample will be aged 6 – 23 months

The precision achieved for all indicators is similar to that achieved by other surveys of key child survival indicators such as EPI vaccine coverage surveys. Better precision may be obtained, if required, by increasing the overall sample size or by collecting the sample using more smaller clusters.

### Experiences with the new IYCF indicator

We have now used the simplified and structured IYCF indicators in the form described above in the DRC, Ghana, Ethiopia, Niger, Sierra Leone, and Sudan. Our experiences with this approach to assessing IYCF practices have been:

- The data are easy to collect, enter, and analyse. Box 2 shows a typical data collection form. Data may be entered and analysed in a spreadsheet by program staff. The calculation of indicators using spreadsheets has, however, proved to be error-prone. Dedicated software has been developed and is now available. The software is free, open-source, customisable, and can work with data in a wide variety of formats (e.g. plain text, dBase, SAS, SPSS, STATA, and EpInfo/EpiData). Figure 3 shows a screenshot of the software being used with data from a standardised small-sample monitoring and evaluation survey of coverage (IYCF counselling, CMAI screening, vitamin
A supplementation, anti-helmintic drug distribution, and growth monitoring, global acute malnutrition (GAM), IYCF, and WASH indicators from a district in Sierra Leone.

The indicators are integrated and multidimensional (see Figure 1). This makes results easy to report, present, and use.

The indicators are easily interpretable by program staff and program managers. Table 1 and Table 2 show the complete calculation. These are readily understandable, and have a clear face-validity compared (e.g.) to the WHO proposed indicator presented in Box 1.

We have used the indicators in RAM and S3M type surveys. The indicators work well with the small sample sizes (i.e. typically between \( n = 96 \) and \( n = 192 \)) used in these types of survey. The indicators may also be used with SMART type surveys. The use of the indicators in RAM and S3M type surveys is, however, more cost-effective. Experiences in Ethiopia, Niger, and Sierra Leone show that RAM and S3M type surveys are readily understandable, and have a clear face-validity compared (e.g.) to the WHO proposed indicator presented in Box 1.

Experiences in Ethiopia, Niger, and Sierra Leone suggest that costs may be as high as 45% of this may be context dependent. Ongoing work using RAM in an urban setting in Ethiopia suggests that costs are as high as 45% of those associated with SMART surveys. The use of quick and cheap survey methods allows IYCF to be monitored over small areas and on a frequent basis without excessive expenditure on survey activities. The precision achieved by these surveys is similar to that achieved by a typical EPI vaccine coverage survey (see Figure 1). The levels of precision achieved were considered useful by UNICEF, ministries of health, and NGOs for these surveys to be used to inform program design and to monitor program outcomes. Better precision may be obtained, if required, by increasing the overall sample size or by collecting the sample using more small clusters.

**Figure 1: Survey results presented using the indicator hierarchy**

<table>
<thead>
<tr>
<th>% EBF</th>
<th>85.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Good</td>
<td>37.5%</td>
</tr>
<tr>
<td>% Currently breastfed</td>
<td>89.8%</td>
</tr>
<tr>
<td>% Component Score ≥ 2</td>
<td>60.6%</td>
</tr>
<tr>
<td>Mean ICFI score</td>
<td>3.02</td>
</tr>
<tr>
<td>% Component Score ≥ 2</td>
<td>34.3%</td>
</tr>
</tbody>
</table>

The results shown here are from a small-area RAM type survey from Sierra Leone*.

**Box 1: A complicated indicator**

\[
\text{EBF} = \begin{cases} 
0 & \text{if } \text{(IYCF Q7 = 1 OR (Q7a = 1) AND (IYCF age in days ≥ 183) AND (IYCF age in days < 274) AND (7 food group score ≥ 4) AND (IYCF Q14 = 2)) OR} \\
1 & \text{if } \text{(IYCF Q7 = 1 OR (Q7a = 1) AND (IYCF age in days ≥ 274) AND (IYCF age in days < 730) AND (7 food group score ≥ 4) AND (IYCF Q14 = 3)) OR} \\
0 & \text{if } \text{(IYCF Q7 = 2 AND Q14 = 2) AND (6 food group score ≥ 4) AND (IYCF Q18 + Q1C + Q11F ≥ 2) AND (IYCF age in days ≥ 183) AND (IYCF Q18 + Q1C + Q11F + Q14 ≥ 4))} 
\end{cases}
\]

**Construct the 7 food group score as follows:**

Begin with a score of 0.

For each of the 7 food groups, add a point if any food in the group was consumed.

- **Food group 1** Add 1 point if: IYCF Q10G = 1 OR Q12A = 1 OR Q12C = 1
- **Food group 2** Add 1 point if: IYCF Q12K = 1
- **Food group 3** Add 1 point if: IYCF Q12I = 1
- **Food group 4** Add 1 point if: IYCF Q12Q = 1 OR Q12D = 1 OR Q12E = 1 OR Q12F = 1
- **Food group 5** Add 1 point if: IYCF Q12F = 1
- **Food group 6** Add 1 point if: IYCF Q12B = 1 OR Q12D = 1 OR Q12E = 1 OR Q12F = 1
- **Food group 7** Add 1 point if: IYCF Q12I = 1

**Construct the 6 food group score as follows:**

Begin with a score of 0.

For each of the 6 food groups, add a point if any food in the group was consumed.

- **Food group 1** Add 1 point if: IYCF Q10G = 1 OR Q12A = 1 OR Q12C = 1
- **Food group 2** Add 1 point if: IYCF Q12K = 1
- **Food group 3** Add 1 point if: IYCF Q12I = 1
- **Food group 4** Add 1 point if: IYCF Q12E = 1 OR Q12F = 1 OR Q12G = 1
- **Food group 5** Add 1 point if: IYCF Q12B = 1 OR Q12D = 1 OR Q12E = 1 OR Q12F = 1
- **Food group 6** Add 1 point if: IYCF Q12I = 1

This is one of fifteen indicators proposed by the WHO.

**Box 2: The simplified IYCF questionnaire**

**IYCF Behavioural Indicators Questionnaire**

1. **F1:** Was [NAME OF CHILD] breastfed since this time yesterday?
   - Yes
   - No

2. **F2:** Does [NAME OF CHILD] take any food or drink other than breastmilk?
   - Yes
   - No

3. **F3:** How many times was [NAME OF CHILD] fed mashed or pureed food or solid or semi-solid food as a meal or a snack since this time yesterday?
   - Yes
   - No

4. **F4:** Since this time yesterday has [NAME OF CHILD] received any of the following things to eat or drink?
   - Yes
   - No

   **Tick all that apply.**

   A Any liquid other than breastmilk
   B Tinned milk, powdered milk, fresh milk, sour milk, cheese, yoghurt
   C Any food made from grain, roots, tubers, or plantain such as millet, bread flour, rice flour, cassava flour, maize flour, corn flour, corn meal, bulgar, barley, sorghum, rice, corn, gari, foo-foo, porridge, Irish potatoes, white sweet potatoes, yams, cassava, plantain
   D Any food made from fruits or vegetables with yellow or orange flesh such as carrots, pumpkin, red sweet potatoes, oranges, lemons, papaya, pineapple, mango OR dark green leafy vegetables such as cassava leaves, potato leaves, grain-crain, greens, kalam OR and food made with red palm oil or red palm nuts
   E Any other fruits or vegetables
   F Any food made from lentils, beans, peas, groundnuts, nuts, benni (sesame) seeds, or other seeds
   G Any meat, bush-meat, liver, kidney, heart, chicken, duck, fish, seafood, crab, lobster, shrimp, snails
   H Eggs or any food made with eggs

This questionnaire has been localised for use in Sierra Leone (i.e. local names and recipes have been used).

An age question is needed. This may be added to this questionnaire or be part of a larger questionnaire of which this questionnaire is a component. Age should be recorded in months.

The exclusive breastfeeding (EBF) diagnostic indicator makes use of all collected data (i.e. not just the response to question F1) and is calculated as:

- if F1 is TRUE and F2 is FALSE and F3 = 0 and all (F4A, F4B, F4C, F4D, F4E, F4F, F4G, F4H) are FALSE then EBF = TRUE
- else EBF = FALSE
- if AGE > 5 months then EBF = NOT-APPLICABLE

Question F4A is used to calculate the EBF indicator but is just the response to Question F1) and is calculated as:

\[
\text{EBF} = \begin{cases} 
1 & \text{if } \text{F4A = TRUE} \\
0 & \text{else}
\end{cases}
\]

This questionnaire has been localised for use in Sierra Leone (i.e. local names and recipes have been used).
Presented in Table 1, is required to finesse the proposed indicators.

The results shown here are from an S3M type survey from Ethiopia. Local estimates are from n = 144 (n = 48 from each of three neighbouring clusters).

The indicators can be complemented by the collection of other indicators relevant to IYCF and child survival such as food security, safe drinking water, good sanitation, coverage of (e.g.) IYCF counselling services, vaccine coverage, and wealth/poverty in the same survey. The indicator presented here offers clear advantages over those proposed by the WHO.

Conclusion

Improving IYCF practices is an important programme goal. The indicators proposed by the WHO are of limited value in planning, monitoring, and evaluating IYCF programs. A new approach is needed. This article presents a useful alternative to the indicators proposed by the WHO. More work, such as improving the ICFI scorings algorithm presented in Table 1, is required to fine-tune the proposed indicators.

For more information, contact: Mark Myatt, mark[a]brixtonhealth.com

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3 Arimond M, Ruel MT. Generating Indicators of Appropriate Feeding of Children 6 through 23 months from the KPC 2000+, Washington DC, FANTA/AED, 2003
5 Ruel MT, Menon P. Creating a Child Feeding Index Using the Demographic and Health Surveys: An Example from Latin America. Food and Nutrition Discussion Paper #130, Washington DC, IFPRI, 2002
10 Working Group on Infant and Young Child Feeding Indicators. Developing and validating simple indicators of dietary quality and energy intake of infants and young children: Summary of findings from analysis of 10 data sets. Report submitted to the Food and Nutrition Technical Assistance (FANTA) Project/Academy for Educational Development (AED), August 2006.
While the authors do assert the need to finesse their newly proposed indicators, for example, through improving the infant and child feeding index (ICFI) scoring algorithm, even more important limitations for these proposed methods should be at least mentioned, if not further elucidated, such as:

- The simplified data collection instrument has not been validated in terms of improving data quality nor in relation to a standard methodology. While the data collection instrument appears to have been modified to simplify data collection and analysis, the modifications have not taken into account the main purpose of the questionnaire, which should be to facilitate the complete and correct answers from the respondents. The simplified data collection tool presented in the paper will likely lead to overestimation of exclusive breastfeeding, underestimation of diet diversity, as well as similar problems for other dimensions of IYCF practices.

- Lack of precision: for example, with regard to diet diversity.

- Key dimensions of appropriate IYCF practices are missing: for example, milk feeds for non-breastfed children.

The paper also makes confusing assertions with regard to sample sizes. Nine of the fifteen global IYCF indicators have the same age ranges and thus potential for sample size limitations as those newly proposed in the article by Guevara et al. While the authors specifically criticize the global indicators that have a very small sample size (e.g. Introduction to solid, semi-solid and soft foods for 6-8 month olds), they do not propose any other indicators to replace these and instead only mimic some of the global indicators with the same age ranges and thus sample sizes. It is therefore unclear how the proposed indicators have overcome the sample size limitations being criticized.

The authors argue that a single structured indicator they have proposed aims in decision-making by focusing on the overall IYCF programme. However, it is impossible to identify which programmatic actions require correction, without also using the newly proposed “diagnostic” indicators. This is because the single indicator approach combines both exclusive breastfeeding (0-5 month olds) and appropriate feeding for 6-23 month olds, thereby making it unclear which practices contribute most to the final score. For example, the interventions required to make changes in the exclusive breastfeeding practices in working mothers, are different from those to help ensure diet diversity among older children of these same mothers. If the diagnostic indicators are used in order to balance the single composite indicator, it must be noted that they will suffer the same sample size issues as many of the global indicators, which therefore leaves this sample size issue unresolved.

The current article in Field Exchange wrongly asserts that the entire set of global IYCF indicators are not appropriate for assessment at the sub-national (regional, district and sub-district) level. While the 2008 WHO indicator document acknowledges ‘small-scale programmes’ as being out of the realm of common use, when appropriate sizes have permitted, many of the WHO indicators have been successfully applied to generate estimates at the sub-national level as evidenced through survey reports.6,7

We are concerned by the authors’ conclusions that the global IYCF indicators have limited value in planning, monitoring, and evaluating IYCF programmes as no evidence is provided as to how they do not function in this capacity. In fact, UNICEF and other stakeholders have been effectively using these indicators in numerous countries, for just these purposes.

We acknowledge that the international nutrition community has not yet filled the gap that the paper by Guevara et al. proposes to fill. There is a need for developing simple user-friendly technical documents for monitoring of small scale IYCF programmes. However, what is offered seems to be a simplification of the WHO 2008 global IYCF indicators. An appropriate approach for assessing changes in small- scale programmes would require (i) alternative, yet valid, survey design and sampling methods appropriate for small area programmes such as a longitudinal design which could allow for use of the global indicators in their current from despite small age ranges; as well as (ii) development of context-specific indicators most likely on a case-by-case basis to best reflect specific interventions of these small-scale programmes. We are eager to see that this specific article helps to mobilize our collective action to address shortfalls in indicators for monitoring IYCF programmes and practices as part of our collective contribution to improving infant and young child survival, health and development.

For more details, contact: Diane Holland, UNICEF, email: dholland@unicef.org

We thank the reviewers for taking the time to review our proposed IYCF indicators. We think it important to respond to the ‘more important limitations’ with our proposed IYCF indicators that are presented in the commentary.

We take issue with the term ‘standard methodology’. This is too broad a term to describe a form used to collect data. If we focus on the data collection form for the WHO indicator set we find that no strict standardisation is proposed. The key WHO document provide an ‘example questionnaire’ and guidance for ‘adaptation’ and ‘simplifying the questionnaire’. This guidance explicitly allows the removal of questions related to liquids, reducing the number of food groups used to collect dietary diversity data, and reducing the number of indicators calculable from the collected data. Our simplified questionnaire was created by following this guidance. We believe our data collection form is minimal but standard.

The proposed indicators can be calculated from the simplified dataset and from the full WHO dataset. This allows ‘calibration’ in the sense that the proposed indicators could be applied to existing IYCF datasets in order to create revised baselines for interventions. It also allows ‘validation’ in the sense of comparing estimates of indicator levels from the two indicator sets. Such a validation exercise has not been done but would, we believe, be very easy to do. We suggest that this be done before accepting the reviewers’ assertions regarding bias.

The issue of bias is not straightforward. It is very unlikely that the ‘standard’ questionnaire is without bias. This means that a validation by within-survey comparison is limited to answering the question as to whether two methods exhibit similar biases rather than which method best describes reality. When devising indicators to measure change (e.g. for monitoring and evaluation of pre- rammes) bias is usually a secondary issue compared to issues relating to practicality. There is nothing (e.g.) to stop a scale that consistently returns a weight measurement 200 grams above the true weight (i.e. a 200 gram upward bias) from being used to accurately assess changes in weight. Such a scale might be better at this task than a more accurate but less precise scale.

Accuracy and precision are only two of the attributes that are commonly used to assess the utility of methods used in epidemiological surveys. When designing the pre- posed IYCF indicators we used the framework of Sackett & Holland, modified to include criteria identified by Beaton & Bengoa and by Jelliffe & Jelliffe to extend the basic framework to include criteria specific to nutrition assessment.4,5,10 In this (generally accepted) framework, simplicity, acceptability, cost, objectivity, being quantitative, and age-independence are considered highly important attributes with precision, accuracy, sensitivity, and predictive value being considered of lesser importance. The use of this framework informed the design of the proposed indicators. We are unsure why the reviewers believe that the short form dietary diversity question set will impair precision. We selected the seven item score because validation work by IFPRI and FANTA showed this to be the most precise method.

Other (possibly ‘key’) dimensions of IYCF can be derived from the short form dataset. It is possible (e.g.) to estimate the proportion of children aged between six months and two years who consume foods likely to be rich in vitamin A, calcium, and iron. A longer (e.g. ten item) form might do this better and could be used. Data on liquids could also be collected. We urge that this data be integrated in the indicator structure as (e.g.) part of the ICFI score so as to avoid replicating the confusing proliferation of indicators that we had hoped to address when designing the proposed IYCF indicators.

We believe it is clear from the article and illustrations that the hierarchy of main with diagnostic indicators is to be used when designing, monitoring, and evaluating programmes. We also think the article explores sample size issues more thoroughly than the reviewers allow.

References


2 Sackett DL, Holland WW, Controversy in the detection of disease, Lancet, 1975,2:357-359


uboptimum breastfeeding results in more than 800,000 deaths of children under 5 years annually (11.6%). Nearly 15% of deaths of children younger than 5 years can be avoided (i.e. 1 million lives saved) if ten core nutrition interventions are scaled up. Delivery of an infant and young child nutrition package, including breastfeeding and complementary feeding support, features in the top three interventions in the Lancet 2013 series, with an estimated potential 221,000 (135,000–293,000) lives saved.

Strategies to promote breastfeeding in community and facility settings have shown promising benefits for enhancing exclusive breastfeeding rates, yet in humanitarian contexts, breastfeeding support remains one of the least funded interventions. Since 1996, only 6 out of 86 developing countries (i.e. have made significant improvements in breastfeeding rates (more than 20 percentage points)). The notable success factors in these countries include national government leadership, comprehensive program-mes at multiple levels, engaging multiple partners and scaling-up initiatives. Ineffective approaches, such as ‘one-off’ promotion campaigns or replication of generic messages through sensitisation or mass media, often wrongly assume that ignorance of the benefits of breastfeeding or optimal practices are the major barriers. Effective breastfeeding programmes use evidence from barrier analysis or qualitative work to design strategies which often show that a combination of effective communication activities, skilled healthcare professionals in counselling, appropriate healthcare policies and community engagement is needed.

This article shares field experience from the International Rescue Committee (IRC) Mali programme in using an infant and young child feeding (IYCF) barrier analysis tool as part of a Semi-Quantitative Evaluation of Access and Coverage (SQUEAC) assessment, in order to design a comprehensive breastfeeding programme. The article focuses on the assessment process.

Programme context

The IRC has been present in Mali since 2012. In nutrition, IRC supports the Ministry of Health (MoH) in the community based management of acute malnutrition (CMAM) in Kati, Kalabankoro and Nara Districts (Koulkoro Region) and in Menaka District (Gao Region). As acute malnutrition in the Sahel is on the rise and Mali is undergoing a ‘triple-crisis’, IRC recognises the importance of intensifying efforts so that CMAM treatment (focusing on increasing coverage) is strengthened by high-impact programmes that address underlying causes of acute malnutrition, particularly IYCF.

Mali has seen exclusive breastfeeding rates increase from 8% in 1996 to 38% in 2006, however in 2012-2013, exclusive breastfeeding rates in the Southern part of the country seem to have stagnated at 33%. It is therefore essential to ensure continuous reinforcement of breastfeeding practices to reduce malnutrition and save more lives in Mali.

The approach

In 2009, a resource for use in training to support integration of IYCF practices into CMAM programming was developed at an international level to meet an identified gap. The materials comprise facilitator notes and handouts to support training of health care personnel and community health workers. A slightly modified version of the ‘Breastfeeding (and Complementary) Practices Matrix’ included in the resource has been used by the author in several countries to collect local IYCF practices, beliefs and barriers to optimal practices to inform and design IYCF programmes. The results of the matrix have been used in three ways:

- To include barriers, actual practices and programmes to improve breastfeeding practices.


Table 5.1: Number of children admitted to OTPs in Kati District

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6mo</td>
<td>2807</td>
</tr>
<tr>
<td>6-12mo</td>
<td></td>
</tr>
<tr>
<td>12-18mo</td>
<td></td>
</tr>
<tr>
<td>18-24mo</td>
<td></td>
</tr>
<tr>
<td>&gt;24mo</td>
<td></td>
</tr>
</tbody>
</table>

Location: Mali

What we know: Sub-optimal infant and young child feeding (IYCF) practices significantly contribute to under 5 deaths. There are many examples of interventions that are ineffective as they fail to address context-specific barriers to optimal breastfeeding patterns.

What this article adds: An IYCF barrier analysis tool was included as part of a scheduled SQUEAC assessment by IRC in Mali. The output comprised a matrix of recommended versus actual feeding practices; beliefs and attitudes; barriers and motivating factors. Targeted messages were drafted to incorporate into a comprehensive breastfeeding programme. Where there is staff capacity, qualitative IYCF assessment via SQUEAC is feasible and improves the chance of programme effectiveness.
**Figure 2: Mapping the YCF indicator hierarchy**

<table>
<thead>
<tr>
<th>Recommended Practice (A)</th>
<th>Actual Practice (B.1)</th>
<th>Beliefs and Attitudes (B.2)</th>
<th>Constraints to improving practices / or motivating factors (B.3)</th>
<th>Recommendations and Targeted Messages (C) (Examples of possible targeted messages below, not validated)</th>
</tr>
</thead>
</table>
| **Initiation of breastfeeding within the first hour after birth** | Most know to start breastfeeding immediately after birth, however if breastfeeding doesn't come in right away – will give warm water (or juice) to wait until the mature milk comes in (the first few days) | • Believe that breastfeeding right away favours the milk coming in.  
• Believe that breastmilk is the only food for the newborn, unless a problem arises and women don't have enough milk | • Reported that women are tired after delivery and don't always give the breast right away.  
• Health workers don't place babies skin-to-skin immediately after birth, lack of trained support on lactation management issues and no baby friendly policies in place  
• Lack of trained support for home deliveries | • Healthcare/community support for deliveries (10 steps to successful breastfeeding)  
• Immediately after delivery, keep the baby skin-to-skin and frequently breastfeeding so the breastmilk will come in sooner  
In the first few days after birth, colostrum is all a baby needs – giving water can cause illness |
| **Giving colostrum** | • Most give colostrum immediately after birth  
• Some wait for the baby to cry before giving colostrum  
• Most give warm water before the colostrum | • Most give colostrum at start as believe needed for the survival of the infant  
• Believe that it protects the infant from illness and clean the intestine  
• Believe that colostrum is rich for the infant and serves as the first vaccination  
• Believe that warm water nourishes the infant therefore give it before colostrum | • Some women reported that they know they should not give water, however older women in the village encourage this practice  
• Lack of breastfeeding support immediately after delivery | • Healthcare/community support for deliveries (10 steps to successful breastfeeding)  
• Engage wider community (older women, etc)  
• Babies fed only on colostrum are fully protected against infection and well-nourished - babies fed water or other liquids are more likely to become ill.  
• Colostrum is soft and helps a baby pass their first stool. Warm water is not necessary and can cause illness. |
| **Exclusive breastfeeding until 6 completed months of age (no food or liquids)** | • Most women start giving water after the religious naming ceremony (on the 7th day)  
• If pregnant or have a milk insufficiency – start supplementing with warm water, juice, tea and traditional medicine  
• Don't give breastmilk if they feel the breast is hot when women are in the sun  
• Give water if the infant has a stomach ache  
• Give water to facilitate the teeth coming in | • Believe the infant needs water and traditional medicine to protect from the bad spirits – husbands also recommend to do this  
• Believe need water as throat is dry and quenches the thirst  
• Believe six months is too long for an infant not to drink water  
• Believe tears and herbal drinks can prevent illness and stomach aches and helps the teeth come in  
• Believe if the child cries, must give them water as they are thirsty  
• Believe that warm water ensures the health of the child - this treats sickness, stomach ache and big belly  
• Others feel that if they don't give water, they risk the death of the infant  
• Feel the child will be sick if give hot breastmilk (from being in the sun) | • The older women in the village insist that women give supplements to the baby – even if mothers know better.  
• Older women, mothers-in-laws and husbands influence practices  
• Significant community pressure to give water – otherwise people say you could risk the 'death' of your baby and people will think you're a bad mother  
• Cultural beliefs and misconceptions | • Community skilled breastfeeding follow-up and home visits within the first week and at naming ceremonies  
• Engage community in breastfeeding support  
• Breastfeeding counselling and support groups so all women are reached (multiple contact points)  
• Widespread effective communication through multiple channels (e.g., radio, local markets, traditional healers, etc) to influence men and elders (men/women) in the community (particularly to address giving water too early)  
| **Appropriate complementary feeding** introduced | • Most aware to start complementary foods at 6 months – most give sorghum, millet, maize porridge with water and sugar as the first food  
• Others give family foods (no separate portion for young children) – sorghum or millet with a baobab, okra or peanut sauce (sometimes there is fish, fruits or potatoes)  
• Others give soup with potatoes, tomato, fish or meat | • Most are aware that breastmilk can't cover all the needs of the infant after 6 months  
• Most are aware that continued breastfeeding helps the growth of the child, also the health and intelligence of the child  
• Older women and mothers-in-laws insist not to prepare food separately for a young child, as this will create a division with the other children  
• Poverty, lack of diversity in household foods (also sell foods that grow like fruits to buy other HH needs) | • Link with economic or livelihood programming to improve HH resources and dietary diversity | • Breastfeeding counselling and support groups trained on skills to show women how to maintain a breastmilk supply when away from the baby and to prevent milk insufficiency  
• Family planning programmes also discuss breastfeeding and address misconceptions  
• See strategies above to improve EBF rates  
• Effective communication strategy developed to address misconceptions |
| **Continue breastfeeding to two years and beyond** | • Most breastfeed until 2 years – some continue until 3 years (if the woman does not become pregnant) – others stop after 1 year when they become pregnant or they have an insufficient breast milk supply  
• Will stop breastfeeding completely as soon as women realise they are pregnant or will stop breastfeeding if have an insufficient milk supply – will give other milks or soup/porridge of meat or fish | • Some believe that continuing to breastfeed will prevent pregnancy  
• Most believe that breastmilk (while pregnant) becomes hot and sour and will transmit illness to the infant  
• Believe that if give the breast while pregnant, it can cause diarrhoea or death and the community will judge badly a woman who continues to breastfeed (as if she will kill her child)  
• Some believe that continuing to breastfeed to two years will decrease the intelligence of the child – believe children will become an ‘idiot’  
• Others noted necessary to stop breastfeeding at 12 months as believe infant will have diarrhoea, becomes weak or could die as the milk is of low quality  
• Few reported that continuing to two years will reduce the frequency of illness in the infant | • Lack of family planning  
• Lack of exclusive breastfeeding (early pregnancy)  
• Women's workloads (reducing frequency of breastfeeding) and lack of knowledge and support on how to maintain a breastmilk supply  
• Health workers not skilled to support women to maintain or increase their breastmilk supplies (many had their own misconceptions on the causes of an insufficient breastmilk supply)  
• Cultural beliefs and misconceptions | • Breastfeeding during pregnancy does not harm the foetus, however the mother has extra nutritional demands |

**Field Article**
beliefs in breastfeeding counselling training to ensure that participants can adequately address these barriers and beliefs by the end of the training.

- As part of an infant feeding assessment (including in emergencies) to develop an appropriate programme response.
- To develop targeted breastfeeding messages that address local beliefs and misconceptions as part of a wider breastfeeding programme.

In the case of Mali, the adapted matrix was used as a framework to inform programme design.

Methods

Data collection for the IYCF barrier analysis is qualitative and should be exhaustive and triangulated with multiple sources (e.g. men and women in the community, caretakers in the CMAM programme, health workers, community outreach workers, midwives/traditional birth attendants.) and methods (interviews, focus group discussions, semi-structured interviews and observation).

As this is also a rule that applies to the SQUEAC method of assessment, IRC undertook a pilot project to assess whether it would be feasible to collect this information as part of the qualitative and routine data collection in stage one of the SQUEAC in Kati District17, Mali.

As IRC’s SQUEAC teams were larger by 1-2 persons than is normally required for a SQUEAC, it was considered that this information could be easily collected during the SQUEAC without affecting quality. However, this additional element should not be included if there is any risk that the quality of the SQUEAC could be reduced. It is not essential to undertake IYCF barrier analysis as part of a SQUEAC assessment; in this instance, it was easier since the SQUEAC teams were already trained on qualitative data collection through triangulation.

The SQUEAC team used an IYCF interview guide (translated into French) to collect actual IYCF practices starting from birth until two years. This information was collected from 35 communities (representing each catchment area in Kati District, Koulikoro Region) through focus group discussions, interviews and observations with community members, health workers and caretakers of severely malnourished children, to ensure the district was covered. Data collection stopped after 35 communities had been assessed and when the SQUEAC teams were sure that saturation had been reached (no new data were uncovered).

Results

The SQUEAC team found that the average age of SAM admissions19 from the Outpatient-Therapeutic Programme (OTP) in Kati District was 14 months (see Figure 1), which supports what we know globally about the majority of acute malnutrition starting before two years20.

The results of the IYCF assessment are presented as a matrix which summarises actual IYCF practices in Kati District compared to each optimal recommendation, as well as cultural beliefs and barriers (see Table 1). Column A reflects optimal recommendations. Columns B1 – B3 present the results of the qualitative data collected. Column C presents the comprehensive recommendations for each stage of the continuum as well as giving space to draft a few targeted messages to address local beliefs and misconceptions. The drafted messages should go through a process of validation and translation to ensure that the intended message is easily understood by the community and part of an effective communication plan21.

The team conducting community focus group discussions with women to collect IYCF practices

The team conducting focus group discussions with men to collect IYCF practices

Discussion

Breastfeeding programmes often take the form of breastfeeding education to mothers. As reflected in the barrier analysis, women feel significant pressure from other community members to go against healthcare advice (even when women know and understand the recommendation).

Perceived or real milk insufficiency is one of the most common reasons why women abandon exclusive breastfeeding globally22 and was also noted frequently in this assessment (it was also widely misunderstood by health professionals who participated). Adequately addressing this issue requires training in lactation management, an understanding of breastfeeding physiology, counselling and the ability to take and interpret a breastfeeding history. This is just one example of one barrier that requires considerable skill which cannot be addressed through generic promotion activities (e.g. posters or replicating generic messages such as ‘Breast is Best’).

Promotion does play a role in breastfeeding programmes, however this should be part of an effective communication strategy based on a qualitative barrier assessment and ‘targeted’ messages and campaigns. These should be developed and validated to ensure they are understood by the community and should serve to complement a comprehensive breastfeeding programme23 (addressing multiple barriers at all levels). For example, the combination of 1) good delivery practices so that breastfeeding gets off to the best start immediately after birth; 2) with early post-partum follow-up (infants are supplemented with water in the first week); 3) with community breastfeeding support for when problems arise (e.g. not enough milk, pregnancy, etc); 4) with an effective communication strategy addressing misconceptions targeted at the wider community who influence women is likely to have a much larger impact24 in Mali.

While women should not be the sole target for poor breastfeeding practices and not blamed for the end result of processes over which they have limited control25.

Qualitative assessments as undertaken in Mali are feasible and will improve the chance of programme effectiveness. The IRC Mali team has developed a comprehensive breastfeeding strategy from the results of their assessment and are currently seeking funding to implement recommendations.

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21Recently, Kati District was divided into two Districts (Kati and Kalanbankoro); both were included in the SQUEAC.

22Collected from patient registers in the Out-patient Therapeutic Programmes (OTPs) (Jan – May 2013), this did not include infants <6 months from the Stabilisation Centre (N=2807).


24See footnote 8

25Every facility providing maternity services for newborn infants should implement the 10 steps to successful breast feeding.

26Protecting, Promoting and Supporting Breastfeeding: The Special Role of Maternity Services, a joint WHO/UNICEF statement

27Colostro is the first yellowish breastmilk produced after birth – rich in antibodies it helps protect the baby from infection, aids the formation of good bacteria in the gut and eases the movement of the meconium. Colostrum is often referred to as the baby’s first vaccination.

28All infants should start receiving adequate foods in addition to breast milk from 6 months onwards (WHO).


30See footnote 8

3128% of infants (0-5 months) received only water and breast-milk. Mali DHS 2012-2013 Preliminary report.

From 2010-2011, Kenya experienced a severe food security crisis affecting an estimated 3.75 million people\(^1\). Nutritional assessments conducted between April-June 2011 in northern Kenya, found alarming estimates of the prevalence of acute malnutrition among children less than five years of age of 24.4-37.4\%. These data indicated a critical situation and significant deterioration from previous nutritional assessments conducted in 2010\(^2\).

The World Food Programme (WFP) and partners responded by implementing a blanket supplementary feeding programme (BSFP) in six counties (Marsabit, Isiolo, Mandera, Wajir, Turkana, and Samburu) in northern Kenya. The initial target population of children 6-36 months of age or less than 95 cm in stature and pregnant and lactating women (PLW) was provided with monthly rations of corn soya blend and oil, systematic interventions (vitamin A supplementation, deworming and immunisation) and health education.

**Methods**

A prospective evaluation of the BSFP in northern Kenya was conducted using a longitudinal cohort of non-malnourished children between 6-36 months of age enrolled in the BSFP in two of the six counties (Turkana and Wajir). Thirty evaluation sites were selected in each county, based on the anticipated number of children who would attend the first supplementary food distribution at each distribution site. The cohort was identified and enrolled during the first distribution; there was no subsequent enrollment. The cohort was followed for four sub-sequence distributions; distribution was intended to occur at 30 day intervals at each distribution site. The duration of a distribution cycle (the number of days between the distribution at the first distribution site and last distribution site) and the mean interval from prior distribution (the average number of days between the current distribution and prior distribution across all sites) were calculated. Reasons for delays in distribution were observed.

At each distribution site during each distribution, a household questionnaire was administered to caretakers of the children enrolled in the cohort. The questionnaire collected data on potential risk factors for malnutrition, including household demographics, recent morbidity and treatment, water and sanitation, utilisation and consumption of the supplementary ration (sharing, selling etc.), access to general food distribution or other programmes, household food security, admission into therapeutic feeding programmes, and feeding practices. We also asked about dietary diversity as calculated by summing the 7 food groups consumed on the prior day (1 point per food group: cereals, pulses, dairy, meat, eggs, vitamin A rich fruit and vegetables, other fruit and vegetables). Anthropometric measurements (weight-for-height Z score (WHZ) and mid upper arm circumference (MUAC)) were also collected for enrolled children using standard techniques\(^3\).

Primary outcomes were the overall change in mean WHZ, and the incidence of acute malnutrition (WHZ < -2 standard deviations, a MUAC <125 mm or the presence of bilateral pitting oedema) at any distribution following enrollment. The difference in mean WHZ between distributions was analysed using paired t-tests for comparing group means. Bivariate comparisons of mean WHZ were used to evaluate individual risk factors for changes in nutritional status, and a hypothesis-driven logistic regression modeling was used to identify baseline risk factors for incident malnutrition. Methods are described in detail in the full report\(^4\).

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Results
A total of 3,856 children were screened during the first BSFP distribution at 59 sites (29 in Turkana and 30 in Wajir) of whom 2,779 were eligible for enrollment in the evaluation (1,386 in Turkana and 1,393 in Wajir). Children who had implausible increases or decreases in height or weight or who were obviously not the enrolled child were excluded. This resulted in available data for 1,209 (87%) and 1,266 (91%) of children in Turkana and Wajir, respectively. Of these, 757 (63%) attended all five distributions in Turkana, and 1012 (84%) attended all five distributions in Wajir. These children were included in the analysis below.

Five distributions of thirty days of ration occurred over eight months with significant variation in the time between each distribution. Reasons for the large differences in the interval between distributions included delays in transport and lack of prepositioned commodities. In Turkana, the duration of distribution for each distribution cycle ranged from 33 to 78 days with mean interval from the immediate prior distribution ranging from 27 to 62 days. In Wajir, the duration of distribution for each distribution cycle ranged from 10 to 49 days with mean interval from the immediate prior distribution ranging from 29 to 78 days. In both counties, the period between distribution cycles two, three, and four was approximately two months each.

During the BSFP, overall mean WHZ among children who attended all five distributions improved in both counties (Figure 1). In Turkana, mean WHZ increased from the first to the fourth distribution from -0.92 to -0.69, before plateauing at the final (fifth) distribution. In Wajir, WHZ rose from -0.89 at the first distribution to a high of -0.52 at the fifth distribution. In Wajir, the change from the first to all subsequent distributions was significant. In Wajir, there was a significant change from the first to all subsequent distributions; however the mean WHZ decreased significantly from the first to third distribution.

In Turkana and Wajir, 15% and 22% of the children, respectively, who came to all five distributions became acutely malnourished by our criteria during the evaluation period. For these children, at any distribution following identification of malnutrition, all severely malnourished children in Turkana returned to normal, while 98% of moderately malnourished children improved to a normal nutritional status at the subsequent distribution. In Wajir County, 54% of moderately malnourished children and 63% of severely malnourished children improved to a normal status by the subsequent distribution. Only 4% and 6% in Turkana and Wajir, respectively, reported currently receiving treatment for acute malnutrition at the subsequent distribution.

In both counties, missing one or more distributions, and baseline characteristics of having an illness in the four weeks, receipt of other foods and non-food aid, household size, number of children in the household, having a parent caregiver, having a measles vaccination, vitamin A status, and ration sharing were not significantly associated with the mean change in WHZ from the first distribution (D1) to the fifth distribution (D5). In Wajir, baseline breastfeeding was significantly associated with larger increases in WHZ from D1 to D5. In both Turkana and Wajir, children who developed acute malnutrition at any distribution had a significantly lower dietary diversity than those who had normal nutritional status throughout the programme.

Attendance at a prior distribution and delays in distributions did not have an association with the development of malnutrition. Logistic regression modeling of baseline risk factors and subsequent development of malnutrition by any measure showed that low baseline WHZ (-2 to -1.5 compared to the WHO reference population) was the significant risk factor for developing malnutrition during the programme period.

Discussion and limitations
Our primary goal was to evaluate the impact of the BSFP as an integrated package (ration, immunisation, systematic treatment, and education) on preventing deterioration in nutritional status among children 6-36 months of age. This entailed specifically using WHZ, MUAC and presence of bilateral oedema for outcome determination. The results suggest that as a group, children enrolled in this BSFP experienced an overall improvement, not a decline in nutritional status by WHZ. This was statistically significant from the first to the last distribution in both Turkana and Wajir counties. These interesting results provide a detailed look at the cohort of children over an eight month period, but as expected, it was impossible to fully attribute these findings to the BSFP.

Clearly, the situation in these counties was dynamic and overall household indicators improved during BSFP. A key finding was that BSFP rations were consumed in less than 30 days; over half of the ration lasted less than 14 days in both Turkana and Wajir counties, less than half the planned distribution cycle of 30 days. Although this is not a new finding in ration-based programmes, it is important to consider in the analysis and interpretation of the data.

Despite the overall improvement in WHZ score, a subset of children attending all distributions (15% in Turkana, 21% in Wajir) developed malnutrition at least once. In both Turkana and Wajir, children who had a lower WHZ or MUAC, or who had a lower dietary diversity upon enrollment, were more likely to develop acute malnutrition. In general, some malnourished children will spontaneously recover to a normal nutritional status and this happened in both counties. In both Turkana and Wajir, very few malnourished children reported ongoing treatment or treatment in the prior month.

Significant risk factors for developing acute malnutrition while enrolled in the BSFP varied by county, highlighting the complexity of implementing standardised BSFP across large geographic areas and diverse populations. Overall, the inconsistency between significant risk factors by location may be due to spurious associations expected when examining a large number of variables in a statistical model. Clearly, children with low baseline WHZ score were at significant risk for subsequent malnutrition.

The implementation of BSFP was challenging, and this evaluation assessed the programme as it was actually implemented. Our data highlighted issues with the application of admission criteria into the programme, as 20% and 25% of children enrolled in the programme and subsequently included in the cohort should have been deemed ineligible for the BSFP programme by height or age (i.e., children above 95 cm in height and/or older than 36 months) in Turkana and Wajir, respectively. The BSFP was designed as five monthly distributions, but challenges such as insecurity, poor coordination, inconsistent food pipeline, and transport difficulties led to frequent delays in distribution.

There are several limitations to this evaluation. In general, the impact of a BSFP is methodologically difficult to assess since it cannot be routinely followed over time in these programmes. Furthermore, as it is a blanket programme, there is no control group for comparison. Additionally, the BSFP in northern Kenya was an integrated programme with a ration and a package of interventions, making it difficult to attribute a similar effect. There are also many potential confounders at the child, household, village and county levels, which we did not control for that could influence the nutritional status of the cohort over time. The most prominent of these is the overall improvement in food security and pasture and animal conditions, as a result of adequate rainfall during the evaluation period.

Several questions arose during analysis. A key issue is the development of acute malnutrition and more specifically, what is an acceptable level of malnutrition in a BSFP? We do not have consensus or guidance on this question. The absence of established benchmarks for both entry and outcome indicators (change in WHZ score and incident malnutrition) make evaluation of BSFP effectiveness difficult to determine. Also, given the complexity of BSFP and the implementation of the strategy, what is the best evaluation methodology for BSFP?

There are several recommendations for improving BSFPs based on both the data from the evaluation and field observations made during the distributions. First, a single admission criterion such as height (rather than age) should be used by all programmes, and this should be consistently applied across all distribution sites. Second, to obtain the greatest impact of the programme, the provision of the ration must be timely and with minimal delays. Third, referrals of malnourished children to treatment programmes for acute malnutrition need to be strengthened and guidance on referral and follow-up of cases should be provided to the partners providing services for treatment. Finally, BSFPs have become standard programming in nutrition emergencies; ongoing evaluation of these programmes should be considered given the tremendous resources required.

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**Health system strengthening through material support to health posts in Ethiopia**

**By Charlotte Walford, Lulseged Tolla and Pankaj Kumar**

Charlotte Walford has been working with Concern Worldwide in Ethiopia since September 2012 supporting their CMAM and IYCF programmes. She has 15 years of field experience, mainly in Malawi and Namibia, in many aspects of nutrition, food security, HIV and the integration of nutrition with agriculture, working for NGOs and UN agencies.

Lulseged Tolla has been working with Concern Worldwide since 2011 on CMAM and IYCF programmes. He supports field projects on monitoring and evaluation, operational research and other related technical aspects. He has more than 10 years’ experience in the field of public health.

Pankaj Kumar has been working in Ethiopia with Concern Worldwide since 2010. Prior to Ethiopia, he had worked in Zambia, Zimbabwe, Bangladesh, Nepal, Liberia and other African countries. He has a keen interest in agriculture and nutrition issues.

The authors would like to thank Goitom Taddesse and staff from Concern’s Mekele office in Tigray for their assistance. Assmaw Ashete, Sinead O’Mahony and Suzanne Fuhrman are acknowledged as authors of the Rapid Assessment on Storage and Handling of Ready to Use Therapeutic Food (RUTF) in Tigray Region, that prompted the material support to the health posts. Grateful thanks are also extended to the Tigray Regional Health Bureau, woreda officials and health post staff for their assistance in this initiative and, finally, to the World Bank/John Snow Development Fund for funding support.

**Location: Ethiopia**

**What we know:** CMAM treatment services are increasingly integrated into existing government health posts. This requires capacity to physically store necessary Ready to Use Therapeutic Food (RUTF) and medications supplies.

**What this article adds:** Concern Worldwide investigated the storage and handling of RUTF at supported health facilities the Tigray Region of Ethiopia. Severe deficits were found in 34% of government health posts, moderate deficits in 43% and mild deficits in 23%. Actions taken were design and delivery of lockable medical cabinets to 90 health posts and delivery of portal weighing scales stands (an additional problem observed during the assessment) to 60 health posts. Recommendations include the need for national RUTF supply/storage guidance and training on supplies management.

This article describes Concern’s experience in identifying gaps in the storage and handling of Ready to Use Therapeutic Food (RUTF) in five woredas in Tigray Region of Ethiopia in 2011 and the subsequent material support provided to the health posts. Health system strengthening is a component of a larger programme which is piloting community-based management of acute malnutrition (CMAM) service delivery in 24 woredas across four zones in Tigray. In addition, optimal infant and young child feeding (IYCF) practices are promoted through posters, cooking demonstrations and counseling in seven of the woredas.

**Background**

Tigray Region is one of the most food insecure regions in Ethiopia. According to the 2011 Ethiopia Demographic and Health Survey, 9.7% of children under five years of age (U5) suffer from acute malnutrition (wasting), 28.7% are underweight and 44.4% are chronically malnourished (stunted). However, in Tigray Region, the prevalence of malnutrition is higher than the national average: 10.3% of children U5 are wasted, 35.1% are underweight and 51.4% are stunted. CMAM is an effective treatment for acute malnutrition and has, during the last few years, been scaled up across Ethiopia under a national policy of decentralisation of CMAM services to increase coverage.

Whilst a positive development, this places considerable stress on the health facilities, especially the health posts. In order to ensure the health extension workers (HEWs), who provide the preventative outreach services at the health posts, have the capacity to cope with the increased workload, non-governmental organisations (NGOs) and government health experts have increasingly been providing technical support, plus the logistical support involved in the delivery of Ready to Use Therapeutic Food (RUTF) and routine medications. However, in the initial construction of the health posts, no appropriate storage space was planned as they were intended to provide preventative outreach health activities only and not treatment. General space available for storage is severely limited.

**Concern Worldwide’s programmes in Tigray Region**

Since 2007, Concern Worldwide Ethiopia has been providing support to Tigray Region for the treatment of acute malnutrition through the CMAM approach, which has now been integrated into service delivery at health facilities. In August 2009, funding secured from the World Bank allowed the continuation of this intervention in five disadvantaged woredas in the region, namely Medebay Zana, Mereb Lehe, Raya Almata, Sasis Tsada Emba and Tahitay Adiyabo, until 2013. The project aims to improve access to CMAM and to promote optimal IYCF practices for children U5 to reduce morbidity and mortality related to malnutrition. In June 2011, the project was expanded to 24 woredas.

Key activities include joint supportive supervision visits in health facilities, provision of on-the-job training to health care providers, including HEWs, and operational research studies aimed at improving the implementation of, and access to, CMAM. Simultaneously, further assessments are being conducted and trained health workers are being deployed, in order to improve current IYCF practices.

**Storage issues**

RUTF is the primary product used for treating severe acute malnutrition in CMAM through the outpatient therapeutic programme (OTP). Whilst several mechanisms have been put in place to ensure that malnutrition is properly detected and treated at community level through CMAM decentralisation, RUTF storage problems at Woreda Health Offices (WoHOs) and health facilities might compromise the smooth running of OTP. RUTF management has never been assessed in any part of the country since the CMAM programme was incorporated into primary health care service delivery in 2008. At present, there are no RUTF and logistics management guidelines in Ethiopia.

**Assessment**

To address this information gap, a qualitative rapid assessment of storage and handling of RUTF and other OTP supplies at WoHOs and health posts in the five target woredas in Tigray was conducted during March-April, 2011. The objective was to investigate how OTP supplies are being stored and handled, identify risk factors in the storage practice and develop feasible solutions to alleviate identified problems.
Methodology
Five WoHos and all 72 functional health posts were included in the assessment. One representa-
tive from each site was interviewed. This assessment did not include hospitals and health centres as they do not handle RUTF. Data were collected using standardised interview question-
naires administered to Maternal and Child Health (MCH) experts at WoHos and health extension workers at health posts. To capture the physical condition of the actual storage of RUTF and OTP supplies, professional observation and documenta-
tion using digital cameras were conducted. Thematic framework analysis was used to analyse the data.

Operational definitions
Health posts were classified based on the findings as follows:

• Mild – if the facility staff needed some aware-
ness training on supply management or some modifications in the existing storage system.

• Moderate – if the facility required maintenance in addition to minor modifications or awareness training.

• Severe – if the facility needed more than one intervention or required the provision of new materials or construction.

Results
The response rate for health posts varied between 100% (Medebay Zana) and 53.3% (Tahitay Adiyabo), with an overall response rate of 79.2%.

Most health professionals and HEWs reported difficulties relating to the optimal storage of RUTF: it was rarely stored in a locked, self-contained cabi-
net or store room, as recommended for other medical supplies. The assessment found that only 42% of health posts kept RUTF in a storeroom with medical supplies. Of the remaining health posts, 37% stored RUTF on the floor or on a bench, 14% in either locked or unlocked cabinets, whilst 7% stored RUTF in the examination room, bags or at nearby health centres. Rats were found to be a problem in 50% of health posts and weevils in 4%. Based on the find-
ings in individual health posts, the problem of RUTF storage and handling was assessed as ‘severe’ in 19 (34%) health posts, ‘moderate’ in 24 (43%), and ‘mild’ in 13 (23%).

The major speculated causes of these problems were inadequate consideration for optimal storage during health post construction, as such absence of a store room, presence of openings or holes around the edges of windows, doors and/or under the roof and lack of provision of suitable lockable cupboards or cabinets to counter the identified deficiencies.

Seventy five percent of WoHOs kept their RUTF supply in a separate lockable store (nearby health centres) and distributed it immediately.

Recommendations
The assessment demonstrated that RUTF storage is problematic at health post and WoHO levels and recommended that prompt action was necessary to ensure that OTP service delivery did not suffer. Each health post needed at least two or three inter-
ventions for improvement: provision of cabinets (34 health posts); maintenance of holes and open-
ings between floor, walls and doors; creating partitions or fixing broken cabinets (24 health posts) and provision of supply management train-
ing for staff. At woreda level, early distribution of RUTF supplies to their catchment health facilities and provision of shelves were recommended.

Action: storage cabinets
In collaboration with the Tigray Regional Health Bureau (RHB), an appropriate lockable metal cabi-
net was designed and manufactured locally. These were delivered to 90 health posts within the five woredas identified during the assessment as lack-
ing optimal storage conditions for RUTF and essential OTP supplies. Each cabinet cost approxi-
mately US$545, totalling US$49,050 for the 90 cabinets.

After having been in use for several months, HEWs reported no loss of RUTF due to rats or weevils and the possibility of theft has been removed. Routine medications for the OTP and other treatment programmes, in addition to the equipment and supplies for IYCF outreach, are locked and stored under cool, dust and pest free conditions as is internationally recommended.

An estimated 900 children suffering from severe acute malnutrition will benefit from the availability and safe storage of RUTF, whilst for HEWs are reas-
ured by the knowledge that OTP supplies are cleanly and safely stored.

Ordering patterns have not changed as routine monthly ordering is mandatory within the Ethiopian health system. However, as RUTF is an expensive product, the avoidance of loss due to poor storage conditions has been achieved through a simple, lasting solution that will have economic benefits for the Tigray RHB.

Additional observations
During project activities, it became evident that some health posts lacked appropriate equipment to safely weigh children U5 during growth monitor-
ing sessions or medical examination. Crudely-
made wooden stands, often with splinters and/or protruding nails, were used to hang Salter weighing scales. They are heavy, often unstable and cannot be moved easily. Occasionally, the scales are hung from the (dusty) rafters in the health post. The majority of HEWs work is outreach in their communities. They are unable to conduct regular growth monitoring outside, using a tree to support the scales, as there is usually a very cool wind blow-
ing at the high altitudes of Tigray Region – an infant undressed for weighing will be severely chilled.

Within the houses, rafters are usually unreachable or not strong enough. Health post staff requested that a stable, yet portable, hanging weighing scale stand be designed and manufac-
tured to ensure growth monitoring can be conducted safely, both at the health post and in the community. An informal assessment was made throughout the health posts to calculate how many stable, portable hanging scale stands were required and where.

Action: Weighing scales stand
A sturdy, portable, metal stand was designed and locally made, tested for stability and practicality before mass manufacture and distribution. Sixty five health posts identified as needy in the general assessment received the stands. Cost per metal stand was US$46; US$4,160 in total. The feedback from HEWs has been enthusiastic, especially as the stand is very stable and portable, so it can easily be taken (usually on donkey back!) for growth moni-
toring to any village in their catchment area. The scale itself hangs more steadily, facilitating more accurate reading of the child’s weight, as it is not dangling at the end of a long rope, like a pendulum.

Conclusions and recommendations
Practical, durable solutions to enhance the effective delivery of OTP services in rural health posts also strengthens other primary health care services such as antenatal clinics and paediatric medical exami-
nations. Requiring little or no maintenance apart from cleaning, the lockable cabinets and sturdy weighing scale stands will be in use for years to come.

Further recommendations for actions are to:

• Develop clear guidelines for RUTF handling and storage in collaboration with government and other stakeholders.

• Emphasise the importance of RUTF as a medical supply, rather than a food item.

• Provide training for HEWs to address logistic management problems.

• Supply RUTF storage facilities and other IYCF/CMAM equipment to health posts based on needs assessment.

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Impact of goat feeding and animal healthcare on child milk access in Ethiopia

By Gezu Bekele, Esmail Tessema Ali, Genene Regassa and Nicoletta Buono

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Esmail Tessema Ali is a Project Manager with VSF Germany in Afar since March 2012. He holds a veterinary medicine degree from Hawassa University, Ethiopia. Esmail has more than six years of experience with marginalized pastoralist communities focusing on emergency response in drought prone areas of Ethiopia.

Genene Regassa is country programme manager and focal person for VSF Germany in Ethiopia. He holds a veterinary medicine degree from Addis Ababa University and an MA in participation, Development and Social Change (Institute of Development Studies (IDS), UK) with more than 18 years of professional experience, mostly working in pastoral areas of Ethiopia.

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This article is the result of the Vétérinaires Sans Frontières (VSF) Germany project in Afar regional state funded by the Office for the Coordination of Humanitarian Affairs through its Humanitarian response fund (UNOCHA-HRF). The authors acknowledge UNOCHA-HRF for continued support of humanitarian response projects in the most vulnerable pastoral areas of Afar region. Our immense gratitude goes to Afar Region Pastoral Agriculture Development Bureau, district line offices and pastoral communities from Afdera and Berehale who invested their time in sharing their views, thoughts and benefit of the project during impact assessment. We also thank Mr. Adrian Gs, from Food and Agriculture Organisation of the United Nations (FAO), who offered technical support during the design of impact assessment and also facilitated a discussion forum to share the findings of the assessment to a wider audience through a Disaster Risk Management Agricultural Task Force meeting (DRM, ATF).

Location: Ethiopia

What we know: Drought negatively impacts on animal health and survival. This is especially critical in pastoral communities whose livelihoods depend on livestock. Animal milk is an important nutrient source in pastoral children.

What this article adds: Goat supplementary feeding and voucher based community animal healthcare was implemented amongst pastoralists in two drought affected districts of Ethiopia. Impact on goat milk production, milk off-take for household use, animal survival and child access to milk used was evaluated using quantitative and qualitative methods. Households reported a fall in flock size and goat birth rate during the drought. Mortality in kids born to goats that received supplementary feeds was significantly lower compared to kids born to goats that were not supported. Milk off-take was significantly higher in supplementary fed goats. A significant difference in mean milk off-take between the two districts may partly explain district differences in kid survival. Plain animal milk was prioritised to children under 5 years of age in households; focus group discussions reported child nutrition benefits.

Under the Humanitarian Response Fund (HRF) programme, the United Nations Office for Coordination of Humanitarian Affairs (UNOCHA) provided a grant to Vétérinaires Sans Frontières Germany (VSF Germany) to implement a livelihood based intervention project in Afar region, Ethiopia, with a view to protecting young children against drought-induced malnutrition. The project was designed in response to poor performance of the sugum season rain in the second quarter of 2012, which was characterised by critical water shortage problems for humans and livestock, deterioration of pasture, livestock mortality, abnormal migration, high school dropouts and closure of schools in several woredas.

The project had two main interventions components: animal supplementary feeding and animal health care targeting goats. It was implemented between late September 2012 and end of February 2013 in Afdera and Berehale districts of the Afar region. The rural population are Afar pastoralists whose livelihoods depend on livestock. They keep mixed herds of cattle, small ruminants and camels through seasonal movements between the wet and dry seasons’ grazing areas. These districts are classified as lowlands, with ponds and wells serving as water sources for both people and livestock during the dry months. Recurrent drought affects these areas every year.

Project aims and objectives

The aim of the project was to improve child nutritional status by increasing their access to goats’ milk. It was expected that a combination of animal supplementary feeding and animal healthcare would sustain and increase daily milk off-take and reduce animal mortality. This should improve household and child access to animal milk and so positively impact on child nutrition. In order to test this causal logic, an impact study was conducted in April 2013 by an independent consultant. Both quantitative and qualitative methods were employed to measure the daily average milk off-take and rate of mortality on both fed (goats receiving supplementary feeding) and unfed (no supplementary feeding). Particular emphasis was given on the survival of kids (baby goats) born during the drought period.

The specific objectives of the assessment were to:

• Assess the impact of the feeding and animal healthcare interventions on goat milk production.
• Assess the impact of the package (feeding and animal health service) on the mortality of kids.
• Assess the impact of feeding lactating and pregnant goats on child nutritional status during the drought situation based on views solicited during focus group discussions and household interviews.
• Draw lessons to inform future decision making and planning for emergency animal feeding, specifically lactating animals.

Interventions

Animal supplementary feeding

VSF Germany’s supplementary feeding programme in Afdera and Berehale (Afar National Regional State) was implemented between September 2012 and February 2013. The approach used by VSF Germany was to prioritise milking and pregnant goats with concentrate feed distributed to the owners. The daily ration was fixed at 0.3 kg of concentrate feed per adult goat. In Afdera, the concentrate was distributed from eight sites and in Berehale, from four sites. Eight goats were targeted with concentrate feed in each household. Between September 2012 and February 2013, concentrate was distributed six times at 21 day intervals. A home-based feeding

The milk used for human consumption, excluding the milk consumed by the young goats (kids)
approach was used that incurred lower running costs than a central feeding system.

**Voucher based animal care**

During the supplementary feeding period, VSF Germany implemented a new voucher-based treatment intervention for livestock. This was delivered through Community Animal Health Workers (CAHWs) and a public veterinary service. Herdsmen were responsible for purchasing drugs administered as prophylactic and curative treatments with Vouchers received from the programme. The vouchers were distributed to individual recipients once at the beginning of the programme. Each recipient secured nine vouchers with a total value of 240 birr.

VSF was responsible for supplying veterinary stock used for the voucher programme to the district veterinary unit. The district veterinary unit supplied CAHWs with initial veterinary drugs and then treatment in exchange for vouchers submitted. CAHWs received 20% of the cost of the submitted voucher in the form of cash from VSF Germany as a mark-up. Both VSF Germany and districts veterinary unit were responsible for monitoring the implementation process.

**Impact assessment**

**Focus group discussions and household interviews**

A field assessment was carried out in April 2013 to collect primary data from beneficiary communities and government. Household questionnaires and focus group discussions (FGDs) were used to collect the information. The primary objective was to assess project participants’ perception of the project implementation process and impacts in terms of daily milk off-take and survival of the drought-affected goats.

In Afdera district, focus group discussions and interviews were conducted in five villages: Kullil, Adoloyo, Da’abu, Horahur and Sireba. In Berehale district, the assessment was conducted in three villages namely Dawayitio, Gahare and Afbure. In total, 29 and 30 households were interviewed in Berehale and Afdera assessment sites respectively.

A checklist was designed for interviews of households who received goat feed from VSF Germany. Questions included the number and body condition of goats at the onset of the supplementary feeding support, amount of feed received, date of kidding, lactation period, whether the milking goats fed with concentrate were pregnant at the time of the supplementary feeding period. Milk off-take measurement

**Milk off-take measurement**

Milk off-take was assessed using two methods:

1. Milk off-take recorded during the supplementary feeding period (recorded milk off-take): VSF Germany recorded morning and afternoon milk off-take collected from a total of 1,134 milking goats in 12 intervention sites. The sample comprised 450 goats in four sites in Afdera and 684 goats in eight sites in Berehale.

2. Milk off-take assessed by owners (demonstrated milk off-take): 29 women were consulted in five villages in Afdera and 30 women consulted in eight villages in Berehale. These informants were asked to fill graduated cylinder with water to reflect an average morning and afternoon milk off-take for each of the milking goats fed with concentrate received from VSF Germany during the supplementary feeding period.

The morning and afternoon milk off-take data for both samples was summarised using Microsoft Office Excel 2007 and analyzed with PASW Statistics version 18. The analysis was repeated for each of the two study districts.

Chi-tests were conducted to compare mortality in the kids born to goats fed with feed received from VSF Germany and those goats fed normally.

**Results**

**Impact of drought on the goat population**

Based on household data, the drought led to a decrease in the total flock size between April 2012 and April 2013 as follows (see Table 1):

- In Berehale, the goat population declined by 45.9% (262/578) with deaths due to starvation amounting for around 89.4% of the flock loss.
- In Afdera, the goat population declined by 45% (262/578) with deaths due to starvation accounting for around 85.4% of this flock loss.

The drought also led to a reduced birth rate. The 12 FGDs estimated the proportion of survived kids born in 2012 Kerma season to be 12.5% on average. Table 2 illustrates the average proportional piling scores conducted by 12 FGDs for kids born in each rainy season (kerma and sugum) and the proportion of kids surviving in normal and drought years. According to this, both the birth rate and survival rate for kids fell for both Berehale and Afdera during the drought.

**Impact of VSF supplementary feeding on kid mortality**

The results of interviews carried out with 29 and 30 women in Afdera and Berehale areas respectively were as follows:

### Table 1: Goat flock size change during drought

<table>
<thead>
<tr>
<th>Variable</th>
<th>Location</th>
<th>Afdera (n= 29 flocks)</th>
<th>Berehale (n= 30 flocks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goat population fall for all reasons*</td>
<td>45.9% (293/638)</td>
<td>36.1% (267/740)</td>
<td></td>
</tr>
<tr>
<td>Goat population fall due to death (all causes)</td>
<td>41.1% (262/638)</td>
<td>30.8% (228/740)</td>
<td></td>
</tr>
</tbody>
</table>

*Including death, forced slaughter and sale, but not due to migration

### Table 2: Comparison of births and births surviving in normal and drought years

<table>
<thead>
<tr>
<th>Season</th>
<th>Variable</th>
<th>Normal year</th>
<th>2012 drought</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerma</td>
<td>Births</td>
<td>41%</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Births surviving</td>
<td>24%</td>
<td>None</td>
</tr>
<tr>
<td>Sugum</td>
<td>Births</td>
<td>59%</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Births surviving</td>
<td>41%</td>
<td>None</td>
</tr>
</tbody>
</table>

### Table 3: Kid mortality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Afdera (n= 29 flocks)</th>
<th>Berehale (n=30 flocks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kids borne in kerma 2012 (n)</td>
<td>122</td>
<td>11</td>
</tr>
<tr>
<td>Existing in April 2013 (n)</td>
<td>93</td>
<td>0</td>
</tr>
<tr>
<td>Kids died (n)</td>
<td>29</td>
<td>12</td>
</tr>
<tr>
<td>Percentage of kids died (%)</td>
<td>23.8%</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Table 4: Statistical analysis of kid mortality

<table>
<thead>
<tr>
<th>Chi-square</th>
<th>Afdera</th>
<th>Berehale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kids born to goats fed with VSF feed vs. goats not fed</td>
<td>16.2, p&lt;0.001</td>
<td>44.840, p&lt;0.001</td>
</tr>
<tr>
<td>Kids born to goats fed with VSF feed in Afdera vs. Berehale</td>
<td>21.3, p&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Kids born to non-fed goats Afdera vs. Berehale</td>
<td>1.87, p&lt;0.2, ns</td>
<td></td>
</tr>
</tbody>
</table>

ns: not significant
### Table 5: Daily milk production

<table>
<thead>
<tr>
<th>Location</th>
<th>Data source</th>
<th>No. of goats</th>
<th>Mean (CI)</th>
<th>Average milk recording period</th>
<th>Lactation period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afdera</td>
<td>Daily recorded milk off-take</td>
<td>58</td>
<td>847.2 (847.2-891.2)</td>
<td>80 days</td>
<td>94 days</td>
</tr>
<tr>
<td>Berehale</td>
<td>Daily recorded milk off-take</td>
<td>48</td>
<td>724.3 (724.3-743.1)</td>
<td>43 days</td>
<td>108 days</td>
</tr>
</tbody>
</table>

### Table 6: Daily recorded and demonstrated milk production

<table>
<thead>
<tr>
<th>Location</th>
<th>Previously recorded</th>
<th>Daily recorded milk off-take</th>
<th>Previously demonstrated</th>
<th>Daily demonstrated milk off-take</th>
<th>Value of daily mean milk off-take</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afdera</td>
<td>884.6 (802.2-964.5)</td>
<td>891.2 (1119.7-1193.4)</td>
<td>891.2 (1119.7-1193.4)</td>
<td>80 days</td>
<td>94 days</td>
</tr>
<tr>
<td>Berehale</td>
<td>724.3 (724.3-743.1)</td>
<td>743.1 (883.3-964.5)</td>
<td>802.2 (967.8-1156.6)</td>
<td>43 days</td>
<td>108 days</td>
</tr>
</tbody>
</table>

### Table 6: Daily recorded and demonstrated milk production

<table>
<thead>
<tr>
<th>Location</th>
<th>Prevalence</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afdera</td>
<td>21.3% (122/570)</td>
<td>Berehale 21.3% (11/51)</td>
</tr>
<tr>
<td>Berehale</td>
<td>743.1 (724.3-743.1)</td>
<td>883.3 (802.2-964.5)</td>
</tr>
</tbody>
</table>

### Table 7: Utilisation of milk off-take

<table>
<thead>
<tr>
<th>Variable</th>
<th>Afdera</th>
<th>Berehale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of milking goats fed with VSF feed per household</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Average milk production/goat/day (mllilitre)</td>
<td>869.2</td>
<td>373.7</td>
</tr>
<tr>
<td>Total milk production/household/day (mllilitre)</td>
<td>2607.6</td>
<td>1467.7</td>
</tr>
<tr>
<td>Households fed plain milk to children &lt;5 years old</td>
<td>100% (29/29)</td>
<td>72.4% (21/30)</td>
</tr>
<tr>
<td>Households fed milk with food/tea to &lt;5 years old children</td>
<td>62.1% (18/29)</td>
<td>53.3% (16/30)</td>
</tr>
<tr>
<td>Households used goat milk with food/tea for adult people</td>
<td>65.5% (19/29)</td>
<td>83.3% (25/30)</td>
</tr>
</tbody>
</table>

### Table 8: Cost-benefit analysis of VSF interventions in Berehale

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs</td>
<td>435.84</td>
</tr>
<tr>
<td>Benefits</td>
<td>833.24</td>
</tr>
<tr>
<td>Total benefits: Cost-benefit ratio</td>
<td>1,232</td>
</tr>
</tbody>
</table>

### Table 9: Cost-Benefit analysis of VSF interventions in Afdera

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs</td>
<td>979.79</td>
</tr>
<tr>
<td>Benefits</td>
<td>2,177.69</td>
</tr>
<tr>
<td>Total benefits: Cost-benefit ratio</td>
<td>2,275.09</td>
</tr>
</tbody>
</table>

### Impact of VSF Germany supplementary feeding on milk off-take

Table 3 presents the average recorded daily milk off-take per goat during the intervention and Table 6 compares this to average demonstrated daily milk off-take per goat during the assessment in April 2013 (see earlier for explanation of both sampling methods). The difference in milk off-take between fed and non-fed goats was statistically significant in both study districts. Demonstrated milk-off take tended to be higher than recorded off-take.

Both the recorded and demonstrated daily mean milk off-take was significantly higher for the Afdera flocks compared to that of Berehale. This higher milk off-take may have contributed to the poorer survival of kids in the Afdera flocks, since less milk was available to feed the kids (see earlier). The general consensus among participants was that the milk off-take was attributable to the project in both areas. Further discussion of the assessment was that milk-off take declined as lactation advanced in time.

### Utilisation of milk off-take by households

Milk off-take from fed goats was prioritised over non-fed goats (see Table 4). This was most likely due to the Berehale study group’s better access to feed to milk their mothers fed with supplementary feed compared to Afdera. Note that the amount of milk harvested per goat per day was higher for the Afdera groups, meaning there was less available for kid nutrition.

There was no statistical difference between the Berehale and Afdera study flocks in terms of kid mortality amongst non-fed goats.

The normal practice amongst Afar pastoralists is to slaughter kids born in the middle of drought to save the mother goat. In this study, almost all women interviewed during the study confirmed that the majority of the kids that existed in April 2013 would have been subjected to forced slaughter in the absence of feed received from VSF Germany.

### Field Article

- In Berehale, mortality in the kids born to fed goats and non-fed goats was 7.1% (12/169) and 50% (19/38) respectively (see Table 3).
- In Afdera, mortality in the kids born to fed goats and non-fed goats was 23.8% (29/122) and 100% (11/11) respectively (see Table 3).
- In Berehale, mortality in the kids born to fed goats and non-fed goats was 23.8% (29/122) and 100% (11/11) respectively (see Table 3). There was a statistical difference observed in kid mortality between the Berehale and Afdera study flocks for fed goats (significantly higher mortality in the Afdera study flocks, 21.3, p<0.001) (Table 4). This was most likely due to the Berehale study group’s better access to feed to milk their mothers fed with supplementary feed compared to Afdera. Note that the amount of milk harvested per goat per day was higher for the Afdera groups, meaning there was less available for kid nutrition.

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Implementing the voucher system required CAHWs to provide services first using their own kits and then replenishing the number of milking goats registered by VSF Germany to be fed. Both calculated a cost: benefit ratio of 1:1.83.

Stakeholder recommendations for future programmes

Table 10 summarises assessment stakeholders’ perceptions of the supplementary feeding programme and their suggestions for future interventions.

Conclusions and recommendations

The overall finding of the assessment was that the animal supplementary feeding programme implemented in Afdera and Berhale districts was justified in terms of cost-benefit ratio. In both areas, mortality in kids born to goats that received supplementary feeds was significantly lower compared to the kids born to goats that did not. This contributed not only to protecting replacement stock and associated post-recovery, but also continuity of milk production in the post-drought period.

In targeting milking goats with supplementary feeding assistance provided to drought-affected pastoralists, the project is likely to have an impact on reducing the problem of child malnutrition. However an important limitation is that ‘evidence’ of child nutrition impact was only anecdotal from focus group discussions. In the future, similar ‘nutrition-sensitive’ projects would benefit from collaborating with a nutrition agency/Ministry of Health to strengthen the nutrition impact assessment of the programme.

Although provision of food aid can help poorer households building flocks, ensuring adequate supply of cost recovery feeds at a reasonable price is essential in the long term since the area is characterised by recurrent drought.

Implementation of the voucher system required CAHWs to provide services first using their own kits and then replenishing these from private sources with the vouchers. However, in this programme, private sources were missing so that the district veterinary unit had to bridge the gap. Sustainability of the voucher scheme and establishment of private sector inputs is needed to support supplies.

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The ENN interviewed Casie Tesfai and Jeanette Bailey from the International Rescue Committee (IRC) for this issue’s agency profile slot. Casie joined IRC as a nutrition technical advisor in 2012 based in the New York office. Her professional life started as a Peace Corps volunteer in rural Niger leading to stints working for GOAL and UNICEF, mainly in West and East Africa. Jeanette was the first nutrition technical advisor to join IRC in 2011 having worked the previous seven years for Médecins Sans Frontières, Action Contre La Faim and Save the Children in Africa, Asia and Latin America. They are both London School of Hygiene and Tropical Medicine alumni.

The IRC was set up in 1933 at the request of Albert Einstein to assist refugees fleeing from the Nazi regime. Pictures of Albert Einstein in the six technical units has specialty teams, e.g. Women’s Rights, Health and Research Evaluation and Learning. Nutrition is located in the Health unit which now has 31 staff members. Each of the six technical units has specialty teams, e.g. environmental health, health system strengthening and nutrition in the Health Unit.

Around 13% of IRC’s international work is in conflict or emergency contexts, 55% in post emergency contexts and 32% in stable situations. Most of its funding is obtained from humanitarian donors such as ECHO, OFDA and CHASE (DFID) and is short-term. This is problematic in contexts where there are continuous needs and the short-term nature of funding requires a lot of administrative work that could be diverted into programming efforts with longer-term funding cycles.
Jeanette acknowledged that this is a problem many agencies face working in fragile states and high vulnerability contexts. IRC is working towards obtaining more of its funding through multi-year awards.

IRC also has an Emergency Preparedness and Response Unit which aims to be deployed within 72 hours of an emergency being declared. This unit undertakes the immediate assessment and develops funding opportunities. The Unit will set up an emergency team which stays for the first three months and then hands over longer-term programming to the technical units.

IRC’s core nutrition programming is the management of acute malnutrition (mainly severe acute malnutrition (SAM)) within CMAM programming. The approach is very much to work within and strengthen government health systems. There are also increasing efforts to address prevention by linking programmes with other sectors in IRC, e.g. water, sanitation and hygiene (WASH), livelihoods and food security. In addition, IRC are turning their attention more to evidence based infant and young child feeding (IYCF) programming. Casie explained how they are looking at better ways of rolling out IYCF within health systems particularly focusing on the feasibility of breastfeeding counselling, its scalability and indicators needed to monitor outcomes. They are also looking at improved models to include complementary feeding. As it happens, an article written by Casie about an IYCF barriers assessment as part of a SQUEAC survey features in this edition of Field Exchange.

Jeanette also explained how most of the acute malnutrition treatment programmes (currently being implemented in ten countries) do not include moderate acute malnutrition (MAM) treatment (MAM treatment is only occurring in Chad, Yemen and Kenya). There is a general frustration within IRC (as well as US international non-governmental organisations (INGOs)) about the logistical challenges of providing treatment for MAM and the need to better integrate SAM and MAM programming. To address this, the IRC is working to pilot a combined protocol for the treatment of SAM and MAM, that sees acute malnutrition as a continuum condition, rather than separating treatment into Outpatient Therapeutic Programme + Supplementary Feeding Programme. The combined protocol would then discharge children into a prevention based programme, which depending on the context would be food security, livelihoods or a preventive health care package. The IRC is reaching out to academic and NGO partners to pilot a new protocol across several countries, and would welcome coordination with interested partners.

A major strength of IRC nutrition programming is that as they are implementing health programmes in 22 out of 40 countries in which they work, it is easier to rapidly scale up CMAM programming, train health workers and build capacity within health systems that are already being strengthened. It is also possible for IRC to address malnutrition multi-sectorally as the six technical units work closely together.

Casie acknowledged that there was still a lot of work to do on figuring out what does and doesn’t work in IYCF programming at scale. Both Jeanette and Casie are trying to bring in best practices from other organisations for whom they have worked. They are currently overseeing nutrition programmes in ten countries and want to consolidate programming before rolling out programmes in other countries, i.e. their philosophy is quality over quantity. With regard to CMAM programming, the priority for 2012/13 was about improving coverage and understanding barriers to this.

ENN asked both Casie and Jeanette what had been their main learning through their experience within IRC and in former agencies. Jeanette said that she had learnt new approaches for addressing the underlying causes of acute malnutrition. She also feels that agencies are too led by donors, i.e. follow the money, rather than set the agenda and get donors to fund that approach. Both Jeanette and Casie feel that one of the major strengths of IRC is how it creates opportunities for both field staff to learn as well as infusing HQ level staff into field and donor need. Once a year, health coordinators are convened at a meeting/workshop where there are opportunities for learning. A recent meeting in Bangkok addressed leadership issues. Country directors meet regionally and at headquarters to regularly ensure their perspective and needs are being heard. Many efforts are also made to include field colleagues in HQ meetings and strategy development.

Jeanette explained how since she arrived at IRC in Sep 2011, the priority has been getting programmes off the ground. However, the last eight months or so have seen the nutrition team moving forward on research. IRC has two epidemiologists in the Health unit so there is a lot of support. One study they are in the process of setting up involves following the growth of a cohort of children over a 3-5 year period in Turkana, northern Kenya in order to both look at the impact of periodic crisis, as well as the impact of interventions to address these crises. This baseline data will act as the control for subsequent measurements. This is a collaborative effort between Centres for Disease Prevention and Control (CDC)/ACF and IRC and funding is pending. Casie mentioned other research initiatives in the pipeline including some work on looking at the impact of cash transfers in the Sahel - IRC are looking for partners and funding.

When asked what is different about IRC compared to other organisations they had worked in, Jeanette said that the emphasis on decentralised programming and building local capacity was a standout feature. Also, fairly unique is the fact that technical unit teams talk to each other so that programmes aren’t siloed along sectoral lines. Jeanette reminded me that although she and Casie had only arrived in the last three years, IRC have been doing nutrition work for over 40 years. What is hopefully different now is that the work is more streamlined. Although the nutrition team is small (two people) it gets a lot of support from the organisation with nutrition now being a priority for IRC. She also mentioned that the new President and CEO of IRC is former UK Foreign Secretary David Miliband and that following extensive field travel to familiarise himself with IRC programming, he is supportive of growing the IRC’s nutrition work and ensuring that programming is conducted in alignment with IRC’s global portfolio.

After the interview I found myself reflecting on how interesting these agency interviews are and how they do help tease out and distinguish the culture and approach of different agencies. Jeanette and Casie had done a fantastic job in articulating what is unique about IRC and what characteristics it shares with other agencies. One lasting impression from the interview was that IRC is one very professional and thoughtful outfit where nutrition is concerned and that there should be no surprises if IRC increasingly takes a leading role in shaping approaches to nutrition programming in the years to come.

1 Community based management of acute malnutrition
2 Semi-quantitative evaluation of access and coverage
People in aid

BSFP Evaluation Team Training in Lodwar, Turkana Country

Participants in the sixth regional Professional Short Course in Nutrition in Emergencies, Asian Disaster and Preparedness Centre (ADPC), Bangkok, Thailand from 7-18 October, 2013.

Participants at the ALNAP 29th Annual Meeting in Addis Ababa, Ethiopia. See http://www.alnap.org/meeting2014
The Emergency Nutrition Network (ENN) grew out of a series of interagency meetings focusing on food and nutritional aspects of emergencies. The meetings were hosted by UNHCR and attended by a number of UN agencies, NGOs, donors and academics. The Network is the result of a shared commitment to improve knowledge, stimulate learning and provide vital support and encouragement to food and nutrition workers involved in emergencies. The ENN officially began operations in November 1996 and has widespread support from UN agencies, NGOs, and donor governments. The ENN enables nutrition networking and learning to build the evidence base for nutrition programming. Our focus is communities in crisis and where undernutrition is a chronic problem. Our work is guided by what practitioners need to work effectively.

- We capture and exchange experiences of practitioners through our publications and online forum
- We undertake research and reviews where evidence is weak
- We broker technical discussion where agreement is lacking
- We support global level leadership and stewardship in nutrition

Field Exchange is one of the ENN’s core projects. It is produced in print and online three times a year. It is devoted primarily to publishing field level articles and current research and evaluation findings relevant to the food and nutrition sectors.

The main target audience of the publication are food and nutrition workers involved in emergencies and those researching this area. The reporting and exchange of field level experiences is central to ENN activities. The ENNs updated strategy (following mid-term review in 2013) is available at www.ennonline.net