

Field Exchange

Emergency Nutrition Network



- **Combined protocol for SAM/MAM treatment**
- **Intergenerational malnutrition in Somalia**
- **Programming during conflict in South Sudan**
- **Micronutrient distribution in Burundi**
- **Resilience to emergency programming in the Yemen**
- **Mobile phone survey data collection in Kenya**
- **WHO SAM medical kits in South Sudan**
- **Sampling during insecurity in Afghanistan**

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Dear readers

There are three themes running through this issue of *Field Exchange*. We have four field articles which describe the very real practical challenges of having to adapt programming in the face of conflict and insecurity. An article by Mustafa Ghulam and Mohammed Alshama'a, Save the Children, describes adapting a resilience improvement programme in conflict affected Yemen and how a scaled up e-voucher scheme still managed to improve dietary diversity in spite of the high level of insecurity. Meanwhile, an article by Mercy Laker and Joy Toose, World Vision, documents how a CMAM programme had to be adapted in South Sudan when conflict broke out but still managed to provide critical life-saving treatment to young children. Afghanistan is the setting of a field article by Action Contre la Faim, which describes measures taken to allow sampling during programme coverage assessments that both maintained data integrity while protecting the safety of enumeration staff. Finally, an article written about WHO's emergency nutrition response in South Sudan documents the development of a specific medicines kit (and associated training package) for the treatment of complicated severe acute malnutrition (SAM), which allowed programming to continue in the



Diversity of beans in Rwanda

Jean D'Amour, HarvestPlus, 2009

face of a marked deterioration in security. What all these articles have in common is adaptation and innovation based upon an 'on the ground' perspective about what is possible and how best to preserve programme equity and effectiveness in the face of overwhelming challenges for programme staff and beneficiaries. You have to ask if someone somewhere is going to pull all these programming approaches together to produce some sort of guidance on 'how to adapt nutrition-related programming in insecure areas'? A second theme emerging in *Field Exchange* 53 is the role of multi-sector programming in addressing undernutrition. There are a number of relevant research summaries. Complementing the recently released Lancet series on early childhood development (ECD), we have a summary of a series of articles on the role of nutrition in

integrated ECD, which makes the case for multi-sector programming that considers responsible parenting, learning stimulation, education, and social protection, in addition to health and nutrition. Another summary presents the findings of a study on the impact of a cash support grant in South Africa on stunting. No impact is seen and this is explained by high levels of HIV and unemployment, which may confound any effect. There is also a summary of a study in 13 countries looking at the degree to which nutrition is explicitly mentioned in water, sanitation and hygiene (WASH) policies and vice versa. Perhaps surprisingly for this day and age, there is limited incorporation of nutrition and WASH in the respective policies of the other sector. Interestingly, the report authors suggest that the nutrition sector has more of a vested interest in incorporating WASH objectives since we depend on WASH to achieve nutrition outcomes; typical WASH outcomes do not depend on nutrition and so there may be less incentive for integration. There are also two research summaries about the national school feeding programme in Brazil which has managed to legislate for procurement from local farmers who provide the food for the programme. One of the studies looks specifically at lessons learnt about engaging across sectors from more of a political economy perspective and what is required to maximise success.

A final theme, and one which effectively provides an overarching framework for the themes discussed above, is the relationship between development and humanitarian programming and how there are strong conceptual, epidemiological and institutional rationales for closer integration. A critical online article by IRIN (an independent non-profit media venture) highlighted a number of recommendations from the Grand Bargain (a package of reforms to humanitarian funding, launched in May 2016 at the World Humanitarian Summit). Commitments are packaged under 10 measures/areas for reform. One of these measures is 'Enhance engagement between humanitarian and development actors'. This is about working collaboratively across institutional boundaries on the basis of comparative advantage" and "the use of existing resources and capabilities better to shrink humanitarian needs over the long term, with the view of contributing to the outcomes of the Sustainable Development Goals (SDGs)". A summary of a research prioritisation exercise on the relationship between wasting and stunting concluded that the highest priority is to find evidence from evaluations and studies on the optimal timing of treatment and prevention programmes to impact wasting and stunting as part of the same programme. An ENN interview with Rebecca Alum Williamand Shishay Tsadik from the Ministry of Health (MoH) in South Sudan highlights the challenges of integrating an effective nutrition information system (NIS), developed largely by nutrition cluster

partners over a period of years to inform humanitarian programming, with government health information systems. There are also two articles related to chronic disease in the context of emergency programming. One is a summary of a study looking at mortality and risk factors for chronic disease in children who had been 'successfully' treated for SAM seven years earlier in Malawi. Functional deficits were found and most alarming, nearly one-third of discharged cases had died and another 15% were lost to follow-up. These findings really challenge our notion of 'cure' when it comes to SAM; a return to normal anthropometry is not matched with a return to pre-SAM risk level, with long term morbidity and mortality implications. The second article summarises a meeting held by MSF recently which focused on improving care of people with non-communicable disease (NCD) in humanitarian settings. The strand linking all these pieces, either explicitly or through implication, is that there are inextricable links between so called emergency and development nutrition, yet the analytical frameworks and architecture which underpin responses do not reflect this adequately. Availability of resources for nutrition is undoubtedly a common challenge for all; a study by the World Bank provides a timely reminder of what it will cost to achieve global targets for stunting, anaemia, exclusive breastfeeding and SAM treatment – applicable to both humanitarian and stable contexts. The bill comes in at \$70 billion over ten years!

Finally, we would like to draw attention to a new section of *Field Exchange* which we are trialling in this issue. We call this 'snapshots of research' where the 'bare bones' of studies are summarised. The reason for introducing this section is partly economic (to cut down on printing costs), partly appreciating our readers may value a digested read, and partly expedience (there is more and more research being published and given the common ground between emergencies and development, there is a broader spectrum of research relevant to our readership). The short articles in this 'snapshot' are hopefully all of interest and include studies on; the social inequality of child malnutrition in Mozambique, climate change modelling on the effect on food production and global and regional health, trends in adult Body Mass Index (BMI) in 200 countries, the impact on child anaemia of a wheat fortification programming in Jordan and the effect of Lipid Nutrient Supplements (LNS) on morbidity in rural Malawian children. Please let us know if this new section works for you.

We hope you enjoy this issue of *Field Exchange*. As ever, articles, ideas and feedback always welcome.

Jeremy Shoham & Marie McGrath
Field Exchange Co-Editors

A young child enrolled in a treatment programme



World Vision, South Sudan

Nutrition programming in conflict settings: Lessons from South Sudan

By Mercy Laker and Joy Toose



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This article is based on a detailed case study by the authors available at: www.wvi.org/disaster-management/publication/nutrition-programming-conflict-settings-south-sudan-case-study

Location: *South Sudan*

What we know: Violent conflict typically contributes to increased malnutrition levels and challenges humanitarian response.

What this article adds: Challenges to CMAM implementation encountered by World Vision in conflict-affected South Sudan included stretched government capacity, underfunding, supply chain interruptions, destruction of health facilities, limited staff capacity and compromised access. Adaptations made include investment in cluster coordination, development of alternative CMAM sites, training community volunteers, and pre-positioning therapeutic food. A multi-sector rapid response mechanism (RRM) was piloted to access hard-to-reach locations. Experiences show that flexibility and responsiveness are crucial in conflict settings; close coordination between sectors, including logistics, is essential; and predictable, long-term funding is necessary to sustain life-saving programming.

Prolonged hostilities in South Sudan have caused widespread displacement; high rates of death, disease and injury resulting in disrupted livelihoods; severe food insecurity and a major malnutrition crisis¹. Even before the current conflict began, the nutrition situation was chronic. Of 21 counties assessed during the 2013 lean season, 17 had global acute malnutrition (GAM) rates above the emergency threshold of 15%.

Between December 2013 and February 2015, the number of children suffering from severe acute malnutrition (SAM) doubled to more than 229,000². In the worst-hit areas Greater Upper Nile, Warrup and Northern Bahr el Ghazal in 2015, nearly one in three children under five were malnourished. The malnutrition situation was classified as critical (GAM between 15 and 29 per cent) or very critical (GAM above 30 per cent) in more than half the country. Since the beginning of the conflict in December 2013, more than 1.5 million people have been displaced internally, including more than 800,000 children³. People fleeing their homes are forced to abandon their fields and livestock. Many have sought refuge on UN peacekeeping bases or other informal settlements and can no longer grow crops or tend livestock.

The majority of South Sudanese families rely on emergency food assistance to survive. Those not displaced by fighting have faced difficulties in sowing crops due to interruptions in trade and supply corridors for seeds and supplies. Deteriorating food security is compounded by lack of access to clean water, sanitation and basic healthcare, increased prevalence of disease, and negative impact on feeding practices.

Partnering with United Nations (UN) agencies and other non-governmental organisations (NGOs), World Vision's response to the malnutrition crisis in South Sudan is multi-sectoral. The community-based management of acute malnutrition (CMAM) model is used to treat severe and moderate acute malnutrition (SAM/MAM), complemented by food assistance, agricultural initiatives to increase food production and improved access to safe water, sanitation and basic healthcare to children under five years of age and pregnant women. This article documents how World Vision's nutrition team worked with the nutrition cluster through 2014 and 2015 to adapt its CMAM programme to overcome the challenges faced in South Sudan.

Contextual challenges and programme adaptations

A combination of vast geographical area, poor infrastructure and an unpredictable security situation makes South Sudan one of the most challenging and costly operating environments⁴. Contextual challenges for conventional CMAM programming, and adaptations made by World Vision to respond to them, include the following:

Gaps in coordination

In February 2014, a Level 3 Humanitarian

¹ UNOCHA; *South Sudan Humanitarian Response Plan 2015*. reliefweb.int/report/south-sudan/south-sudan-humanitarian-response-plan-2015

² UNICEF; *South Sudan on the edge of nutrition catastrophe if hostilities don't end now*. UNICEF Press Release 4 February 2015. www.unicef.org/media/media_79711.html

³ UNICEF; *South Sudan Humanitarian Situation Report 23* April 2015. reliefweb.int/report/south-sudan/unicef-south-sudan-humanitarian-situation-report-57-10-23-april-2015

⁴ GHA; *South Sudan: Donor response to the crisis*, (2014) 4. www.globalhumanitarianassistance.org/report/south-sudan-donor-response-to-the-crisis

System-Wide Emergency Response was declared in response to the crisis. This reflected the scale, complexity and urgency of the crisis and the inability to implement effective response without system-wide mobilisation. Due to the fragility and stretched capacity of the South Sudan Government and Ministry of Health (MoH), the bulk of leadership and service delivery was taken on by the UN and partner NGOs⁵. Where CMAM programming would usually seek to align with and complement an existing MoH strategy and operations, in South Sudan much of the strategic planning and day-to-day coordination relies on support from UNOCHA (United Nations Office for the Coordination of Humanitarian Affairs) through the humanitarian country team and the sector cluster groups.

Gaps in multi-sector resources

The response in South Sudan has been consistently underfunded. In 2015, only 41 per cent of the required US\$1.6 billion had been committed⁶. Stretched resources left gaps in the system-wide response.

Adaptation: In the context of these capacity and resource challenges, it is more important than ever for humanitarian agencies to actively participate in the cluster system. This demands agency commitment to attend the bi-weekly cluster meetings and ad hoc sessions addressing specific operational issues, improve focus on HRP targets, and leverage limited resources. World Vision's nutrition team also prioritised cluster reporting that ensures better coordination of programmes and helps identify and address gaps or target areas.

Breakdown in ready-to-use-therapeutic food (RUTF) supply chain

Supplies for targeted supplementary feeding programmes (TSFP) were provided by WFP, and supplies for outpatient therapeutic programmes (OTP) and stabilisation centres (SCs) were procured through UNICEF. Stretched resources, poor road access and on occasion insecurity often resulted in breakdown of the supply.

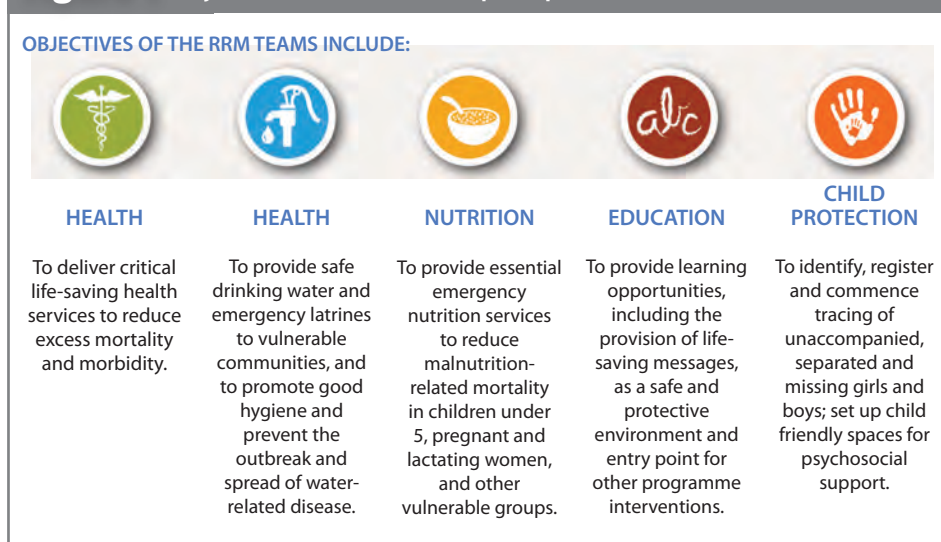
Adaptation: World Vision secured alternative supplies from Canadian and US offices as gifts-in-kind, creating a successful buffer to protect programming.

Poor local health infrastructure

The impact of the current conflict on health infrastructure in South Sudan surpasses that of the two-decade civil war that ended in Sudan's independence. Where fighting has spread, health facilities have been destroyed. Before the crisis, there were more than 300 outpatient treatment centres across the country; by mid-2014, the number had dropped to 183. Access to other programmes addressing acute malnutrition has also declined drastically. Where health facilities still operate, they face significant challenges, including lack of resources for training, low and irregularly paid wages, a lack of supervision at all levels, and high staff turnover.

As a result, humanitarian agencies often struggle to find an appropriate base for CMAM

Figure 1 Objectives of the multi-sector rapid response team



operations and access to referred services for children or pregnant women who require additional medical support. Referred children and pregnant women often have difficulty accessing services or medication due to distance or cost.

Adaptation: In areas without a functioning health facility, World Vision invested in a network of community nutrition volunteers and secured alternative sites such as places of worship for CMAM activities, often transporting equipment and RUTF supplies in and out on an ongoing basis; a challenge that is exacerbated by humanitarian access issues (see below.)

This situation also interferes with capacity-building of local health staff, essential for the sustainability of the programme, which should ultimately transition to local health services.

Adaptation: With capacity-building of local health services out of reach in many areas of operation, the focus is on building community capacity through volunteers who actively participate in case-finding, referrals and follow-up.

However, this community capacity-building does not allow for transition of CMAM responsibilities to government. World Vision acknowledges the need and has continued to resource and respond with CMAM interventions in some of the most hard-to-reach locations in South Sudan.

Access and population movement

Humanitarian access to populations is hindered by lack of infrastructure in South Sudan and by ongoing conflict as fighting prevents staff from travelling to affected communities. Poor road access and flooding during the rainy season, combined with the lack of secure storage for RUTE, can mean that supplies must travel long distances by boat and by foot – increasing the time, cost and risk of programming. This can result in programme activities being delayed or suspended. In addition, the nomadic lifestyle of South Sudanese means high mobility even in the relatively stable locations, while the onset of conflict resulted in recurrent massive population

displacements. The fluidity can make it difficult to achieve the eight weeks of contact required for CMAM treatment.

Adaptation: The CMAM project model offers some measures which mitigate these impacts:

- Increasing the ration of RUTF to malnourished children – providing two or more rations, rather than one week's supply, when fighting is predicted.
- Training community volunteers to monitor the children receiving treatment and help ensure that children receive additional rations if access is impossible.
- Where health facilities are being used, positioning supplies during the dry season before roads become flooded and inaccessible.

Rapid response mechanism (RRM)

In partnership with other humanitarian actors in South Sudan and with funding from the Common Humanitarian Fund (CHF), World Vision trialled a multi-sector RRM to meet the critical needs of displaced populations in hard to-reach areas of the most affected states. RRM missions deploy mobile teams of nutrition water, sanitation and hygiene (WASH); health; child protection; and education technical specialists. (see Figure 1).

Through RRM, between July 2014 and March 2015 World Vision established 14 OTP sites across Unity and Upper Nile States (exceeding the projected 13). It screened 25,729 children for malnutrition, treated 825 children for MAM (through supplementary feeding programmes), and 301 children for SAM through OTPs. It trained 142 community nutrition volunteers in CMAM and infant and young child feeding in emergencies; 36 health workers in CMAM; and 180 mother-to-mother support group leaders.

⁵ WHO; WHO responds to health crises facing war-ravaged South Sudan, (September 2014); Ministry of Health, Health sector development plan 2011–2015, Government of South Sudan, (2011).

⁶ GHA; South Sudan: Donor response to the crisis, (2014) 4.



Transporting RUTF

World Vision, South Sudan

What we learned

In some locations, RRM provided beneficial complementarity surge capacity for existing CMAM programmes. In Bol and Otego districts in Fashoda, for instance, the RRM greatly increased the coverage of existing CMAM programmes through mass MUAC (mid-upper arm circumference) screening and referral of identified children to the existing OTPs for follow-up.

The RRM was quick to fill gaps when a partner was phasing out; for instance, when Médecins Sans Frontières pulled out of Fashoda, the RRM took over the OTP sites in Lul and Kodok. In Koch, the RRM made an impact on the hard-to-reach districts of Nobor and Gany, where the existing partner could not reach. In addition, World Vision's mobile RRM team took part in inter-agency needs assessments, including Kaldak and Canal, and pre-positioned non-food items (NFI) and food items in Rumbek to support activities in Canal and Khorfulus.

In locations where the RRM team trained community nutrition volunteers and mother-to-mother support groups, the number of children screened and enrolled tended to be higher and there was better follow-up of children even after provision of the RUTF. In Melut and Manyo, for instance, volunteers and health workers continued to monitor and provide food to registered children, even after the project phase-out.

In remote RRM sites where the caseload was very high with limited partner capacity, World Vision sought additional funding from other donors to establish a longer-term presence, such as the mission in Koch, Unity State, which was later funded by Irish Aid for one year before being transitioned back to World Relief after the caseload was contained and capacity built.

Flexibility and sensitivity to a changing operational context were key to achieving some targets, such as establishment of 14 temporary OTP sites using tents rather than semi-permanent structures as stipulated in the proposal. Complementarity with other existing programmes was critical in achieving project objectives.

Challenges

Although the RRM was meant to support existing nutrition programmes, it was sometimes misunderstood as replacing, rather than complementing, static programmes. In some instances, this resulted in territorial tendencies, with partners on the ground claiming universal coverage even when communities and the County

Health Department (CHD) reported otherwise. This affected operations.

The project design underestimated logistical challenges around accessing hard-to-reach locations. Some proposed locations were completely inaccessible in the rainy season, and the logistics cluster was sometimes overstretched with numerous priority locations and limited air equipment. Consequently, several planned activities were not executed.

During design, it was difficult to make accurate caseload projections due to ongoing displacements, hence lack of accurate population numbers, while lack of prevalence and incidence data resulted in overestimations. For instance, although the project exceeded its target number of children screened, the proportion admitted to OTPs was significantly lower than expected.

Low RRM coverage in some locations was due to changing contexts, with unanticipated drops in the incidence and prevalence of acute malnutrition in targeted areas. It is also possible that some malnourished children were not reached due to insecurity and population movements. For instance, operations in Canal County were suspended due to recurrent insecurity.

Some proposed interventions were not appropriate for the RRM model. For example, constructing semi-permanent OTP sites was not possible due to difficulties finding skilled contractors and transporting materials to the hard-to-reach locations and insecurity.

Inability to access commodities sometimes prevented the implementation of certain components of CMAM; better early integration with the mobile food aid team could have mitigated this.

Recommendations

Development of terms of reference (ToR) for the RRM prior to implementation and popularising it among partners would have resulted in more success; the RRM technical working group later developed a ToR. More flexibility would enable partners to implement the RRM, allowing it to happen where there are no field-level agreements or partnership corporate agreements in place. Further integration of food-aid mobile teams and nutrition RRM teams would enable partners to implement the full continuum of CMAM, including interventions to prevent malnutrition. The logistics cluster must prioritise its support; hard-to-reach locations present major logistical bottlenecks which partners cannot always overcome alone. Outsourcing serv-

ices during peak seasons can result in more effective responses in future. Inter-cluster collaboration is needed to jointly develop an RRM roster to regulate activities. This will enable better coordination among the partners' various rapid response teams. Mapping of capacity gaps among partners prior to RRM design would help identify specific areas of intervention, avoiding conflict and duplication of activities. Finalising the ToR for the RRM and ensuring it is widely disseminated to all partners will enable common understanding of the mutual benefit the model brings.

CMAM for child survival amid conflict: Results

In 2014, World Vision successfully treated 8,964 children; 3,537 for SAM and 5,437 for MAM through CMAM. World Vision operated three SCs and 33 OTPs in Warrap and Upper Nile states. Food security interventions and WASH projects reached 190,152 people during the same period. This response continued in 2015. Despite disruption of services due to eruptions of violence, World Vision managed to reach more than 235,000 people with food assistance; 97,000 people with WASH interventions; and 26,000 children and pregnant or lactating mothers with treatment for malnutrition. In the 2015 calendar year, humanitarian actors have reached 757,435 people with nutrition interventions. Without interventions across these key areas, the current level of food security and nutrition in South Sudan would be far worse.

Lessons learned

Three higher-level themes emerged in South Sudan that may be relevant to nutrition programming in other conflict-affected contexts:

- Flexibility and responsiveness is crucial in the context of protracted conflict, with teams empowered to respond to rapidly changing conditions. On-the-ground nutrition teams must also have support to design and test new initiatives to overcome challenges. They should also be accountable for capturing and sharing the results and learnings of these initiatives.
- Close coordination within and between NGOs, the UN and humanitarian clusters is essential given weakened national infrastructure. Ongoing insecurity and humanitarian access issues mean significant support from UNOCHA and the logistics cluster is required to assist with access negotiations and to deliver nutrition programmes.
- In the absence of transitioning capacity to local actors, predictable and long-term funding is essential to sustain critical programme delivery and expert staff retention.

World Vision's experience in South Sudan shows that CMAM remains a critical tool for addressing emergency levels of GAM in a conflict-affected context. Direct treatment of malnutrition is crucial to protect children from death and give them (and ultimately their country) the best chance of a secure future.

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A young child enrolled in a treatment programme

Pilot micronutrient powder distribution in Burundi: Acting on lessons learned

By Leni Martinez Del Campo, Emily Sylvia and the Concern Burundi Team



Leni Martinez del Campo was the food and nutrition security officer at Concern Worldwide, where she focused on advocating for greater political support and financial resources for nutrition. She is a graduate of the MPA in Development Practice programme at Columbia University.



Emily Sylvia is a recent graduate of the MPA in Development Practice programme at the Columbia University School of International and Public Affairs, where she specialised in agriculture and food security with a focus on nutrition-sensitive agriculture.

The authors acknowledge the contribution of the Concern Burundi team to the development of this article and thank Kirk Pritchard of Concern for helping coordinate inputs.

Location: *Burundi*

What we know: Micronutrient deficiencies are prevalent amongst children in Burundi. Micronutrient supplementation is one means of tackling it.

What this article adds: A pilot programme distributed a two-month supply of micronutrient powder (MNP) during Mother-Child Health Week, targeting children aged 6-23 months in two provinces of Burundi and supported by community health workers and peer educators. A post-distribution survey of mothers found high distribution coverage (97%), good acceptance of the product, and reported child health benefits (less sickness, more energy). Problems identified included inadequate community sensitisation and follow-up, mislabelled packaging (incorrect age group), and miscommunication between health workers and mothers. These likely affected uptake; 64% of mothers had not used all the supply by the end of the intervention period. Identified barriers were addressed to improve subsequent phases. This experience reinforces the importance of community engagement, feedback mechanisms and adaptive programming.

The current state of child nutrition in Burundi

In Burundi, four out of five people live on less than US\$1.25 per day, making it one of the poorest countries in the world. It is also among the countries with the highest prevalence of stunted children: an estimated 58% of children under five years of age are stunted (height for age <-2 z scores). This is significantly higher compared to other countries in the East Africa region with similar per capita incomes¹. In addition, 35% of children are underweight and 7% are wasted². Less outwardly visible, micronutrient deficiencies are also prevalent. Twenty-five per cent of children under five years of age are vitamin A deficient and 56% are anaemic. Zinc deficiency affects 47% of the population³. Adequate micronutrient intake is important throughout life, but critical during the first 1,000 days (from conception to second birthday) to ensure adequate cognitive and physical development. It is estimated that Burundi loses approximately US\$30 million a year due to micronutrient deficiencies⁴.

MNP distribution project

In an effort to tackle micronutrient deficiencies within the 1,000-day window of opportunity, the Ministry of Public Health and the Fight Against AIDS of Burundi, in partnership with UNICEF, has undertaken widespread distribution of micronutrient powders (MNPs) for children aged 6-23 months as part of the Burundian National Integrated Program for Food and Nutrition (PRONIANUT). This article shares experiences from the pilot MNP distribution initiative in 2014 and 2015.

A pilot MNP distribution was carried out in December 2014 and April 2015 during Mother-Child Health Week (a twice-yearly event) in Cibitoke and Ngozi provinces. All mothers with children aged 6 to 23 months received a two-month supply of MNP sachets (60 sachets) to test acceptability and explore uptake. Community health workers/agents de santé communautaire (ASCs) and peer health educators/maman lumières (MLs) provided mothers with support, sensitisation and education on the adequate use

of MNPs and nutrition messaging. Concern Worldwide Burundi was invited to join this programme to assist in the implementation, sensitisation and education on the adequate use of MNPs.

Concern conducted a post-distribution survey (exit interviews and focus groups) in Cibitoke Province three months after the December 2014 distribution. The December 2014 target was 28,666 children, of whom 28,007 were reached. The survey evaluated the effectiveness of communication and messaging during MNP distribution, focusing on the level of knowledge and

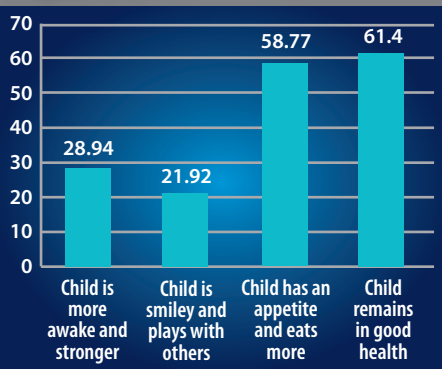
¹ Burundi Country Profile. Global Nutrition Report 2014. http://globalnutritionreport.org/files/2014/11/gnr14_cp_burundi.pdf

² Nutrition at a Glance. World Bank. <http://siteresources.worldbank.org/NUTRITION/Resources/2818461271963823772/Burundi.pdf>

³ See previous footnote.

⁴ UNICEF and the Micronutrient Initiative. 2004. Vitamin and Mineral Deficiency: A Global Progress Report and World Bank. 2009. World Development Indicators (Database), cited in <http://siteresources.worldbank.org/NUTRITION/Resources/281846-1271963823772/Burundi.pdf>

Figure 1 Perceived effects of the use of MNPs



use of the product, storage, and perceived secondary effects of use, to improve the sensitisation component for subsequent phases of the project. Specifically, it examined:

- Were mothers with children aged 6 to 23 months who received MNPs able to use them correctly at home?
- What determinants influenced the use of MNPs among mothers with children aged 6 to 23 months?

A sample of 114 mothers was interviewed for the quantitative evaluation. A sample of 30 mothers, divided into six focus groups, was interviewed for the qualitative evaluation.

Findings from the post-distribution survey

The survey identified a number of positive outcomes. Most mothers perceived that their children were healthier and more energetic (see Figure 1). Mothers reported fewer bouts of child diarrhoea during the intervention period. Mothers had a positive perception of the product; all mothers said they would give their children MNPs again if provided. No significant cultural barriers were identified. The survey substantiated high coverage recorded (97.7%), and all mothers reported receiving MNP sachets free of charge from medical personnel.

The survey also identified a number of key barriers, which are closely interlinked:

1. Poor community mobilisation by ASCs and MLs;
2. Poor follow-up with mothers and health workers;
3. Lack of clarity of the communication/education pamphlet;
4. Mislabelling on packaging; and
5. Unclear messaging with regard to the treatment target group.

The survey suggests that poor community mobilisation was closely linked to insufficient training of ASCs and MLs, who play a critical role in the dissemination of information and mirroring of best practices in their communities. They received only one day of training on the adequate use and importance of MNPs one week prior to Maternal-Child Health Week; this was insufficient to allow full understanding of the process and MNP utilisation (a new intervention to them). The short period between training and distribution did not allow the support agents to conduct visits to homes in their communities to sensitise mothers prior to distribution. In addition, there was no well-defined follow-up strategy to encourage mothers to use MNPs and to answer any questions that arose during the two months following distribution.

The education pamphlet contained two key messages on the use of MNPs and the importance of a balanced diet but failed to explain how these two are linked, and did not contain sufficient and clear information on the use of the sachets. For example, the survey revealed that mothers were not clear on the types of foods that could be used with MNPs. The pamphlet indicated that porridge was the food with which the MNPs could be used, leading mothers to believe that they could only be served over porridge. Additionally, the images used failed to communicate accurately the preparation process, resulting in confusion over the time between adding the content of the sachets to the food and feeding the child, and the temperature the food needed to reach for the powders to be added.

The packages for the sachets displayed the incorrect age group, stipulating that the product should be consumed by children aged between 6 and 59 months rather than 6-23 months, resulting in mix-up among ASCs/MLs as well as mothers concerning who the product was in-

Figure 2 Comparison of the educational pamphlets pre and post-pilot

BEFORE

INGABURO IBEREYE IBA IRIMWO IMFUNGURWA NDEMAMUBIRI, NTANGANGUVU NA NSANGANYANGABURO

Gaburira umwana wanyu imfungurwa zitandukanye: ntanganguvu, ndemamubiri na nsanganyangaburo. Mutegurire imfungurwa zoroshe kandi zirimo ubwo bwoko bwose kugirango aronke ivya nkenerwa bituma akura neza.

Ongeramwo amavuta y'amamesa atukura muri iyo ngaburo imaze guhora kugira ngo umwana aronke icunyuny ca vitamini A.

REPUBULIKA Y'UBURUNDI

INGENE TWOKORESHA IFU IRIMWO AMAVITAMINI N'IVYUNYUNYU MU KUGABURIRA UMWANA

unicef

KU BANA BAFISE AMEZI 6 GUSHIKA KU MEZI 23; KUBAGABURIRA IFU IRIMWO AMAVITAMINI N'IVYUNYUNYU INGENE IYO FU IKORESHWA

1. UGURURA AGASASHE KA YA FU.
2. SUKA IYO FU YOSE YO MURI AKO GASASHE MU NGABURO IMAZE GUHORA.
3. VANGA NEZA UCE UGABURIRA UMWANA WAWU IYO NGABURO MU KIRINGO KITARENZE IMINOTA 30.

KIRAZIRA GUSHIRA IYO FU MU MUSURURU CANKE INDYA BIGISHUSHE!

MENYA NEZA:

MU GASASHE KAMWE HARIMWO VITAMINI 15 HAMWE N'IVYUNYUNYU. BIKA ISASHE Z'IYO FU AHANTU HUMUTSE KANDI HARI ISUKU

NTIMUSHIRE IYO FU MU MUSURURU WIRUKA (UTAVUZE)!

UMWANA ARONKA AGASASHE KAMWE K'IYO FU KU MUNSI. BIRATUMA:

- AKAREBUKA, AGIRA INGUVU,
- AKINA ANEZEREWE
- AGIRA AMAGARA MEZA
- AGIRA AKAYABAGU AGAFUNGURIRA NEZA.

Figure 2 (Cont'd) Comparison of the educational pamphlets pre and post-pilot



Factors influencing pastoral and agropastoral household vulnerability to food insecurity in Kenya

Kenya has a population of more than 38 million, 10% of whom are classified as food-insecure. The Kenyan drylands are populated largely by livestock-dependent pastoral tribes who are particularly vulnerable to food shortages. Prevalent high food and non-food prices, crop failure, livestock diseases and conflict have compounded the already precarious food insecurity in the arid and semi-arid lands (ASALs). Factors contributing to food insecurity and related survival mechanisms are specific to different people and regions, but there is lack of clarity in Kenya on possible causes and solutions to the problem. Further research, particularly at the household level, is needed to inform policy and action in adapting to the impacts of climate change.

This study establishes the determinants of

household vulnerability to food insecurity in pastoral households of Kajiado County and agropastoral households of Makueni County in Kenya. Interviews were conducted with a randomly selected sample of 198 households. Income per adult equivalent was used to estimate household vulnerability to food insecurity, which was calculated as the proportion of households who fall below the poverty line of Ksh 1,239 (£9.99) per adult equivalent per month. Descriptive analysis showed that 59% of pastoral households of Kajiado County were vulnerable to food insecurity, compared to 27% of agropastoral households in Makueni County. Additionally, a two-stage least squares approach (regression analysis) established that vulnerability of households to food insecurity is determined by land size, household size, rainfall and herd size for Makueni County, and by access to climate information,

herd size, off-farm employment and gender of household head for Kajiado County.

The findings imply that Makueni County needs access to and control over land resources, destocking through improved livestock breeds, and creation of a microclimate to enhance rainfall levels. The authors recommend that policies in Kajiado County promote access to climate information, diversification of livelihoods and female access to production resources.

Amwata DA, Nyariki DM and Musimba NRK (2016). *Factors Influencing Pastoral and Agropastoral Household Vulnerability to Food Insecurity in the Drylands of Kenya: A Case Study of Kajiado and Makueni Counties*. *J. Int. Dev.*, 28: 771-787. doi: 10.1002/jid.3123. onlinelibrary.wiley.com/wol1/doi/10.1002/jid.3123/full

Determinants and trends of socioeconomic inequality in child malnutrition in Mozambique

Mozambique has experienced a slow decrease in absolute levels of child malnutrition over the last 15 years. However, levels remain very high, with chronic malnutrition (stunting) prevalence of more than 40% in children under five years of age, one of the highest in the world. Previous studies on child malnutrition in Mozambique have mainly focused on absolute levels of malnutrition and relative trends. This study examines the extent of socioeconomic inequality in child malnutrition, focusing on height-for-age Z-scores, using data from the Household Budget Survey 1996-1997 and 2008-2009, and from the Development and Health Statistics 2003 and 2011. Pro-rich in-

equalities in the distribution of malnutrition are found for all years, and further analysis reveals that most of the inequality in malnutrition is due to inequality in food consumption. The authors claim that, while absolute levels of chronic child malnutrition tended to decrease over time, socioeconomic inequality in malnutrition did not; and actually seems to have increased slightly over the same time period.

Salvucci V. *Determinants and Trends of Socioeconomic Inequality in Child Malnutrition: The Case of Mozambique, 1996-2011*. 2016. *J. Int. Dev.*, 28: 857-875. doi: 10.1002/jid.3135.

WFP/David Orr



Measuring height of a malnourished child at Moamba Health Centre in Mozambique

The migrant camp that doctors built

All around the edges of Europe, as the numbers of refugees and economic migrants have surged in recent years, charities and individual volunteers rather than governments have provided much of the humanitarian assistance on the ground. Although many European countries have officially committed to providing medical services to undocumented migrants,

The medical charity Médecins Sans Frontières (MSF) has built its first refugee camp, at Grand-

Synthe near Dunkirk, to provide basic humanitarian assistance to people in need, regardless of their status. Normally the charity provides medical aid at refugee camps in developing countries that are built and run by United Nations agencies. Doctors at the camp, known as La Linière, have been treating migrants for health issues such as respiratory problems and dermatological problems (including eczema and scabies). There are also chronic diseases and mental health problems. After months of lobbying by non-governmental organisations (NGOs),

the state hospital at Grand-Synthe has opened a clinic specially for migrants. The new camp goes against French Government policy, which is to encourage migrants to give up their dream of getting to Britain and instead claim asylum in France and move to government-provided accommodation for migrants elsewhere in the country.

Sophie Arie *The migrant camp that doctors built*. *BMJ* 2016;352:i1696 dx.doi.org/10.1136/bmj.i1696

Trends in adult body-mass index in 200 countries from 1975 to 2014: A pooled analysis

Underweight and severe and morbid obesity are associated with highly elevated risks of adverse health outcomes. This study estimated trends in mean body mass index (BMI) by using 1,698 population-based data sources, with more than 19.2 million adult participants (9.9 million men and 9.3 million women) whose height and weight had been measured, in 186 of 200 countries for which estimates were made; these 186 countries covered 99% of the world's population.

Global age-standardised mean BMI increased from 21.7 in 1975 to 24.2 in 2014 in men, and from 22.1 in 1975 to 24.4 in 2014 in women. Regional mean BMIs in 2014 for men ranged

from 21.4 in central Africa and south Asia to 29.2 in Polynesia and Micronesia; for women the range was from 21.8 in south Asia to 32.2 in Polynesia and Micronesia. Over these four decades, age-standardised global prevalence of underweight decreased from 13.8% to 8.8% in men and from 14.6% to 9.7% in women. South Asia had the highest prevalence of underweight in 2014, 23.4% in men and 24.0% in women. Age-standardised prevalence of obesity increased from 3.2% in 1975 to 10.8% in 2014 in men, and from 6.4% to 14.9% in women. Globally, 2.3% of men and 5.0% of women were severely obese (BMI ≥ 35); the prevalence of morbid obesity (BMI ≥ 40) was 0.64% in men and 1.6% in women.

If post-2000 trends continue, the probability of meeting the 2025 global obesity target – to halt the rise in obesity at its 2010 levels – is virtually zero. Rather, if these trends continue, by 2025 global obesity prevalence will reach 18% in men and surpass 21% in women; severe obesity will surpass 6% in men and 9% in women. Nonetheless, underweight remains prevalent in the world's poorest regions, especially in south Asia.

Trends in adult body-mass index in 200 countries from 1975 to 2014: A pooled analysis of 1,698 population-based measurement studies with 19.2 million participants. 2016. The Lancet 387 (10026) (October 15): 1377-1396

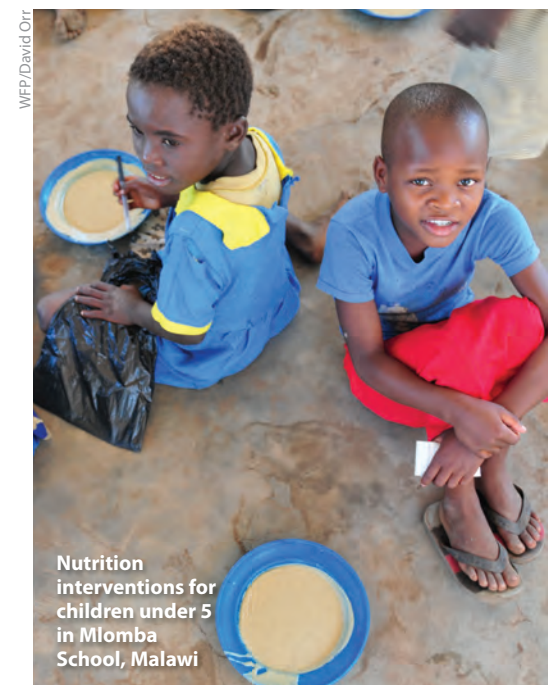
Effect of lipid-based nutrient supplements on morbidity in rural Malawian children

The WHO recommends the use of iron supplements or home fortificants (such as multiple micronutrient powders and lipid-based nutrient supplements (LNS)) to improve iron status and reduce anaemia prevalence among infants and children aged 6-23 months in low-income countries. However, safety of home fortificants in children is uncertain in areas where infections are common. One large trial using iron and folic acid supplements in Zanzibar reported increased risk of malaria and deaths.

A randomised controlled trial in rural Malawi tested the hypothesis that provision of LNS containing iron does not increase infectious morbidity in children. Infants aged six months (n=1,932) were randomised to receive 10, 20 or 40g LNS/d or no supplement until age 18 months. All LNS

contained a total of 6mg iron in the daily dose provided. Morbidity outcomes (serious adverse events, non-scheduled visits and guardian-reported morbidity episodes) were compared between control and intervention groups. Findings were that provision of 10 and 20 g LNS/d containing 6mg iron/d did not increase morbidity in the children. Provision of 40g LNS/d did not affect guardian-reported illness episodes, but may have increased malaria-related, non-scheduled visits.

Bendabenda J, Alho L, Ashorn U, Cheung YB, Dewey KG, Vosti SA, Phuka J, Maleta K and Ashorn P. 2016. The effect of providing lipid-based nutrient supplements on morbidity in rural Malawian infants and young children: a randomized controlled trial. *Public Health Nutrition*, 19(10), pp. 1893-1903. doi: 10.1017/S1368980016000331.



WFP/David Orr

Nutrition interventions for children under 5 in Mlomba School, Malawi

Thailand eliminates mother-to-child transmission of HIV and syphilis

On June 7 2016, WHO certified that Thailand had eliminated mother-to-child transmission of HIV and syphilis. This is not only a public health success story for Thailand, but also an affirmation of how internationally agreed goals – such as the UN's 2001 Declaration of Commitment on HIV/AIDS and the Sustainable Development Goals – can help health ministries to mobilise political will and public funds, and commit to implementation.

Thailand's commitment to address mother-to-child transmission of HIV started in the

1980s, with family education encouraging couples to be tested for HIV before having children. After research found that use of short-course zidovudine could cut the risks of mother-to-child transmission by half, Thailand began a countrywide programme that provided zidovudine as a routine part of antenatal care, tripled the budget for prevention of mother-to-child transmission (PMTCT) services, and lowered costs by manufacturing generic versions of zidovudine locally. Universal healthcare began in 2001 and was made free in 2007; this was extended to include migrant workers, in whom

much higher rates of HIV have been recorded. In 2015, 99.6% of infants born to HIV-positive mothers in Thailand received antiretroviral prophylaxis.

Sidibé, Michel, and Poonam Khetrpal Singh. 2016. *Thailand Eliminates Mother-to-Child Transmission of HIV and Syphilis.* The Lancet 387 (10037) (October 15): 2488-2489. doi:10.1016/S0140-6736(16)30787-5. www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(16)30787-5.pdf

Decline in the prevalence of anaemia among children through wheat flour fortification in Jordan

Children of pre-school age are the most vulnerable to the detrimental long-term effects of anaemia, including impairment of cognitive and physical development and increased morbidity and mortality. In developing countries, 30-80% of pre-school children are anaemic at one year of age. WHO classifies anaemia prevalence of $\geq 40\%$ as a severe public health problem and prevalence of 20-39.9% as a moderate public health problem.

Deficiencies of vitamin A, iron, zinc and iodine have been identified as public health problems in Jordan. The Government has implemented nationwide food-fortification pro-

grammes of salt and wheat flour. This study used retrospective analysis of the data from two repeated, national, cross-sectional surveys conducted in 2007 and 2009 of pre-school children aged 16-20 months and 34-36 months respectively after implementation of wheat flour fortification with multiple micronutrients in Jordan. A total of 3,789 and 3,447 children aged 6-59 months were tested in 2007 and 2009 respectively. The prevalence of anaemia in pre-school children declined from 40.4% in 2007 to 33.9% in 2009. The decline in prevalence was more pronounced among children aged >24 months (-13.7 points); children living in urban areas (-8.0 points);

children from rich households (-9.0 points); children who had never been breast-fed (-17.0 points); and well-nourished children (-6.8 points). In both surveys, presence of childhood anaemia was strongly associated with child age ≤ 24 months, living in poor households, breastfeeding for ≥ 6 months, malnourishment, poor maternal education and maternal anaemia.

Al Rifai R, Nakamura K and Seino K. 2016. *Decline in the prevalence of anaemia among children of pre-school age after implementation of wheat flour fortification with multiple micronutrients in Jordan*. Public Health Nutrition, 19(8), pp. 1486-1497.



Mothers waiting at a distribution of nutrition products (Super Cereal) in southeastern Rwanda

WFP/Chailis McDonough

Making progress towards food security in rural Rwanda

Determining interventions to address food insecurity and poverty, as well as setting targets to be achieved in a specific time period, have been a persistent challenge for development practitioners and decision-makers. Food and agricultural assistance programmes have been widely implemented in sub-Saharan Africa to tackle food insecurity, but there is little evidence demonstrating the impact of those programmes.

This study assessed the changes in food access and consumption at the household level of an integrated food security intervention in three rural districts of Rwanda. Household Food Insecurity Access Scale (HFIAS) scores and household Food Consumption Scores (FCS) were compared at baseline and after one year of programme implementation. All 600 households

enrolled in the Food Security and Livelihoods Programme (FSLP) were included in the study. There were significant improvements ($P < 0.001$) in HFIAS and FCS. Severe food insecurity decreased from 78% to 49%, while acceptable food consumption improved from 48% to 64%. The change in HFIAS was significantly higher ($P=0.019$) for the poorest households. However, future assessments are needed to evaluate the maintenance of HFIAS and FCS improvements and the programme's sustainability.

Nsabuwera V, Hedt-Gauthier B, Khogali M, Edginton M, Hinderaker SG, Nisingizwe MP, Tihabyona JdD, Sikubwabo B, Sembagare S, Habinshuti A and Drobac P. *Making progress towards food security: evidence from an intervention in three rural districts of Rwanda*. 2015:1-9 Public Health Nutr.

Global and regional health effects of future food production under climate change: A modelling study

One of the most important consequences of climate change could be its effect on agriculture. Although much research has focused on questions of food security, less has been devoted to assessing the wider health impacts of future changes in agricultural production. This modelling study estimates excess mortality attributable to agriculturally mediated changes in dietary and weight-related risk factors by cause of death for 155 world regions in the year 2050. The researchers linked a detailed agricultural modelling framework (the International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT)) to a comparative risk assessment of changes in fruit and

vegetable and red meat consumption and body-weight for deaths from coronary heart disease, stroke, cancer and an aggregate of other causes.

The model projects that by 2050 climate change will lead to per-person reductions of 3.2% (SD 0.4%) in global food availability; 4.0% (0.7%) in fruit and vegetable consumption; and 0.7% (0.1%) in red meat consumption. These changes will be associated with 529,000 climate-related deaths worldwide (95% CI 314 000-736 000). Twice as many climate-related deaths were associated with reductions in fruit and vegetable consumption than with climate-related increases in the prevalence of underweight, and most were projected to occur in south and east Asia.

Adoption of climate-stabilisation pathways would reduce the number of climate-related deaths by 29% to 71%, depending on their stringency. Strengthening public health programmes aimed at preventing and treating diet and weight-related risk factors could be a suitable climate change adaptation strategy.

Springmann M, Mason-D'Croz D, Robinson S, Garnett T, Charles H, Godfray J, Gollin D, Rayner M, Ballon P and Scarborough P. *Global and Regional Health Effects of Future Food Production under Climate Change: A Modelling Study*. 2016. The Lancet 387 (10031) (October 14): 1937-1946. doi:10.1016/S0140-6736(15)01156-3.

Meta-analysis of associations between stunting and child development

Despite documented associations between stunting and cognitive development, few population-level studies have measured both indicators in individual children or assessed stunting's associations with other developmental domains. Because stunting is more easily measured, it is often used as a proxy for developmental delay. Yet, although stunting and developmental delay are associated and share many risk factors (illness, poverty, low birth weight, maternal depression, lack of breastfeeding), other risk factors for developmental delay – such as exposure to violence or toxic metals, lack of caregiver responsiveness and inadequate stimulation – will not necessarily result in stunting.

This meta-analysis, using publicly available data from 15 Multiple Indicator Cluster Surveys (MICS-4) in low- and middle-income countries, assessed the association between stunting and development, controlling for maternal education, family wealth, books in the home, developmentally supportive parenting and sex of the child, stratified by country prevalence of breastfeeding (BF) ('low BF' <90 %, 'high BF' ≥90 %). Ten-item Early Childhood Development Index (ECDI) scores assessed physical, learning, literacy/numeracy and socio-emotional developmental domains. Children (aged 36-59 months) on track

in three or four domains were considered 'on-track' overall. The authors found that stunting is associated with many but not all developmental domains across a diversity of countries and cultures. However, associations varied by national breastfeeding prevalence and developmental domain. Mean prevalence of breastfeeding at six months was 89.1% and mean percentage of children aged 36-59 months with on-track development was 65.5%, ranging from 42.6% in Sierra Leone to 85.9% in Belize. Severe stunting (height-for-age Z-score <-3) was negatively associated with on-track development. Any stunting, including severe stunting, was negatively associated with physical development and literacy/numeracy development in high BF countries but not low BF countries. Any stunting (Z-score <-2) was negatively associated with on-track development in countries with high BF prevalence.

Miller AC, Murray MB, Thomson DR and Arbour MC, 2016. *How consistent are associations between stunting and child development? Evidence from a meta-analysis of associations between stunting and multidimensional child development in fifteen low- and middle-income countries*. Public Health Nutrition, 19(8), pp.1339-1347. 10.1017/S136898001500227X.



Photo: WFP/Nyani Quammine

A father waits for a check-up at a community clinic in the Northern Region of Ghana

Who should finance the World Health Organization's work on emergencies?

In May 2015, the 68th World Health Assembly approved the decision to reform the work of the World Health Organization (WHO) on emergencies by creating a single programme for outbreaks and health emergencies. This is accompanied by a Contingency Fund for Emergencies (CFE) to rapidly scale up WHO's initial response to outbreaks and emergencies with health consequences (using the objective criteria set out in WHO's Emergency Response Framework), that merges two existing WHO funds¹. Latest estimates are that core funding needs for the programme and the initial capital of the CFE will range from US\$100 to US\$300 million (£81.77 to £245.32 million) per year respectively, but it is currently unclear how such resources will be raised. Previous attempts to set up similar contingency funds at WHO were hindered by insufficient funding.

This comment explores WHO funding options for the CFE. These include: voluntary contributions from member states (although less realistic due to global economic downturn); private sector foundations who have been responsive to fund appeals (although this would involve re-examining WHO rules on managing conflicts of interest relating to guidance norm setting (the authors suggest these might be less essential for its emergency programmes and cite WFP (UN World Food Programme), who engage with a wide range of private corporations, including Coca-Cola, Unilever, and Danone)); collecting flexible voluntary contributions because of the unpredictable nature of emergencies (a challenge for WHO, since 93% of such contributions are earmarked for specific activities); and bilateral agreements with governments to redirect resources from taxation systems (e.g.

carbon emissions, air fuel and transportation and tobacco have all been proposed as potential new funding sources for global health). WHO should also seek to understand the institutional constraints, particularly with regard to budgeting, that precipitated the slow response to the 2014 Ebola outbreak. Major changes at an organisation-wide level will be required for WHO to truly lead the process of response to health emergencies on a global scale.

Y-Ling Chi, Krishnakumar J, Maurer J, Loncar D, Flahault A. 2016. *Who should finance WHO's work on emergencies?* The Lancet 387 (June 25): 2584-2585. www.thelancet.com/pb/assets/raw/Lancet/pdfs/S0140673616305864.pdf

¹ WHO Rapid Response Account and WHO-Nuclear Threat Initiative Emergency Outbreak Response Fund.

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Tackling the double burden of malnutrition in low and middle-income countries: response of the international community

By Alexandra Rutishauser-Perera

Alexandra Rutishauser-Perera is a Humanitarian Nutrition Adviser with Save the Children. She has ten years of experience of public health nutrition with several international non-governmental organisations in West and East Africa and South-East Asia.

This article summarises key findings of a Masters dissertation undertaken by the author in 2015. The author acknowledges her MSc supervisor, Dr Cecile Knai, for her support.

Location: *LMICs*

What we know: The double burden of malnutrition (DBM) affects many low and middle-income countries (LMICs); there is growing recognition of the emerging problem.

What this article adds: A recent study assessed existing activities, barriers and enablers of 19 international organisations in tackling the DBM in LMICs. Most work has been at policy level which has not yet translated into interventions. Ten agencies were not implementing related programming; barriers included lack of funding, obesity prevention not a life-saving intervention, lack of agency expertise, lack of guidelines and lack of impact evaluation. Shortage of evidenced interventions and donor engagement/funding particularly limit progress. Most respondents favoured using existing international fora to facilitate necessary information exchange. Recommendations include systematically including overweight/obesity data in nutrition surveys; researching the impact of acute malnutrition treatment/rapid weight gain on chronic disease; and monitoring possible conflicts of interests in public/private partnerships.

The double burden of malnutrition (DBM) affects many low and middle-income countries (LMICs). The rate of increase of childhood overweight and obesity in LMICs is more than 30% higher than in developed countries (Wang & Lobstein, 2006) and there are more overweight and obese children in LMICs than in high-income countries (WHO 2015). Physical inactivity and unhealthy diet characterise socio-economic transition (Boutayeb & Boutayeb, 2005). Additionally, the emergence of nutrition-related non-communicable diseases (NR-NCDs) may be compounded by problems of undernutrition, which themselves increase the risk of developing NCDs in adulthood (Darnton-Hill et al, 2004). A child who grows inadequately can be under-nourished in infancy but become overweight or obese later in life if the individual consumes energy-dense foods in excess. The same household can sometimes comprise both an under-nourished child and an overweight adult (WHO, undated). Childhood obesity increases the child's risk of mental and physical health effects, which most LMICs are not equipped to treat ((Boutayeb & Boutayeb, 2005), placing an additional burden on already fragile health systems.

There is growing international recognition of the emerging problem of overweight and obesity in LMICs. However, in practice NGO-led nutrition programming focuses on alleviating wasting and stunting, with very few tackling the problem of obesity (INFPR, 2014).

A recent study assessed existing activities of international organisations and UN agencies in tackling the DBM in LMICs, as well as evaluating the barriers and enablers they face in doing so.

Method

A mix of purposive and snowball sampling was used to identify participants for semi-structured interviews. The interview transcripts were analysed using a framework analysis (Ritchie & Spencer, 1993). Participants (representatives of international organisations involved in agency nutrition strategy development) were identified from International Conference on Nutrition (ICN2) participants, those engaged in the Scaling Up Nutrition (SUN) Movement and researcher contacts. Nineteen interviews were conducted (only one per agency).

Findings

All participants were senior staff at agency headquarters categorised in five programming

sectors: Children (n=5), Food Security (n=1), Health (n=8), Nutrition (n=4) and Relief (n=1), although most had overlap. Ten organisations had more than 20 years of experience. The majority of organisations implemented programmes (n=14); four were policy-based (three UN agencies) and one was an advocacy organisation. Ten agencies were working in both developed and developing countries; nine in developing countries only.

Nine (47%) of the organisations did not integrate any obesity or NR-NCD related activities within their work. Three agencies (16%) integrated the theme of DBM within health education and two agencies (11%) did so within social and behaviour-change activities. Four agencies (26%) had a policy on DBM. Two organisations (10%) had no plans to address DBM, and seven (37%) had only just begun internal conversations about obesity prevention and NR-NCD programmes.

Most work to date has been at a policy level and was conducted by UN agencies to address malnutrition in all its forms, mainly in response to the nutritional landscape faced in the Syria crisis (UNICEF, 2014; Dolan et al, 2014). However, very few DBM interventions were identified amongst implementing agency respondents. Two programme examples were: a 'One Goal' programme led by World Vision in India (Edwards, 2015) and the 'Double Fardeau of Nutrition' (DFN) Project in West Africa, partly supported by Helen Keller International (Pôle Francophone Africain, 2015).

Reported barriers to including DBM activities were lack of funding (n=13), the fact that obesity prevention was not a lifesaving intervention (n=12), lack of agency expertise (n=11), lack of guidelines and impact evaluation on prevention of obesity (n=9), and lack of specific disaggregated data (n=7). Some found it difficult to judge whether DBM was a health or nutrition problem.

The most commonly cited enabler for DBM programming was having more evidence (n=12).

The types of evidence needed included disaggregated data on prevalence, the determinants of obesity, evidence-based programming on prevention of obesity, and cost effectiveness of activities targeting overnutrition. Addressing micronutrient deficiencies by focusing on food quality and higher intake of fruits and vegetables (e.g. school feeding in South Africa), or treating undernutrition (which at a young age can predispose to obesity later in life) were suggested as entry points to develop activities on DBM (n=7). Other factors that contributed to decisions to become involved in DBM programming included existence of a donor strategy to address DBM (n=6), being operational in a country affected by obesity (n=4), obesity prevention included in the targets of the World Health Assembly (WHA) (n=3), and internal expertise (n=2).

Ten participants felt it was not necessary to create a new forum to exchange information on DBM. Only three respondents favoured development of a DBM-specific forum. The top five forums suggested were the SUN Movement (n=7), ICN (n=5), ENN (n=5), UNSCN (n=5), and the Committee on World Food Security (CFS).

Potential negative consequences of current nutrition programming on DBM were: promotion of energy-dense food (n=8); public/private or NGO/private partnerships (n=7); and rapid catch-up growth in infancy for underweight infants or young children potentially increasing childhood obesity prevalence (n=4). Seven participants suggested ways to mitigate negative consequences, including more systematic quantitative analysis of those potential risks; concentrating on effective activities such as breast-feeding; having a more food-based approach regarding the prevention of undernutrition; and including nutrition and counselling in all food security and nutrition programmes.

Discussion

Development assistance providers have started to include prevention and management of NCDs in their programme activities. However the scope of these interventions is still limited geographically and not integrated into nutrition programming. The US ASSIST project still focuses on Europe and Central Asia, with only a few NCD projects in India and Uganda (USAID). The UK Department for International Development (DFID) is exceptional in that it includes commitment to prevent and treat the four major NCDs (cardiovascular disease, cancer, chronic respiratory disease and diabetes) in its 2010-2015 policy.

Despite global improvement in reporting the prevalence of overweight/obesity in different age groups, the data reported are still national-level only (Global Nutrition Report, Malnutrition Mapping Project) (INFPR, 2014; GAIN 2015). The international guidelines on nutrition surveys do not include indicators on overweight/obesity (AAH, 2006). Additionally, there is also a lack of consensus on how to define overweight/obesity in childhood and adolescence (Poskitt, 2009). Data on the

economic consequences of obesity in adults in high-income countries are now well reported, but concentrate mostly on healthcare expenditure; the consequences of childhood obesity are almost never mentioned (Bhutta et al, 2008).

Many believe that the SUN Movement provides an opportunity to address the DBM. However, an external evaluation of the 2014 SUN movement suggested that the movement might dilute its advocacy if it stops focusing solely on undernutrition.

ICN2 focused on the problems of overweight, obesity and undernutrition. However, the timing of the event limits its utility for timely exchange of information. The Committee on World Food Security (CFS), an intergovernmental body created to serve as a forum for review and follow up of food security policies, has agreed to integrate the problem of overweight and obesity into its agenda (FAO, 2015). The CFS is interlinked with the UN Standing Committee on Nutrition (UN-SCN), which connects UN agencies and partners working on nutrition and food policy. The UN-SCN has a dedicated section on Nutrition and NCDs (UN 2015), but funding issues seem to impede its scope of work (WPHNA 2011).

Among the most cited forums in the study, ENN is the most used by field nutrition workers. Since its special edition of Field Exchange on the Syria response in March 2015, ENN now includes articles on the double burden of malnutrition in its communications (Dolan et al, 2014).

The potential for negative consequences of prevention and treatment programmes for undernutrition on childhood obesity are reflected in the literature. Examples include:

- Promotion of sweet, energy-dense products may send misleading messages to parents as well as habituate children's tastes for sugar-rich and calorie dense foods (GIFA 2014).
- Rapid catch-up growth may lead to obesity, rather than increase the height of children, especially when used in prevention (WPHNA; Gupte 2013).
- Action Contre la Faim argues that the potential risk of ready-to-use therapeutic food (RUTF) leading to obesity needs to be further researched, but will continue to use RUTF to treat SAM until the risk is verified (ACF 2012).

The need to evaluate those risks objectively in field programmes persists.

An increase in public/private partnerships and inherent risks to public health are also concerns. The Lancet series on the global obesity pandemic noted: "Governments and international organisations such as the UN need to provide global leadership on these issues and not abdicate them to the private sector" (Swinburn et al, 2013). A positive example of private sector engagement was given in feedback, noting that not all public-private partnerships are the same. Actors working in the field of nutrition request more transparency and monitoring of those partnerships in order to be able to "maximise benefits and minimise risks" (Kraak et al, 2012).

Conclusion and recommendations

This study identified that, despite increased interest among international organisations and UN policy development on prevention of obesity and NCDs, there is an intervention gap in LMICs in catering for the DBM. Lack of donor engagement/funding and lack of evidenced interventions limit progress. There are concerns regarding consequences of current undernutrition treatment programmes for future NCD burden. Key recommendations emerging from this study include:

1. The collection and reporting of childhood and maternal overweight/obesity data should be systematically included in all nutrition surveys;
2. Advocacy for the inclusion of the WHA target on childhood obesity in the SDGs is needed;
3. Epidemiological and operational information on DBM should be integrated into existing international nutrition forums, and particularly more systematically within the SUN movement;
4. More research is needed on the impact of the promotion of RUTF and rapid weight gain in acute malnutrition treatment programmes; and
5. Greater monitoring of possible conflicts of interests in public/private partnerships is required.

Further research, involving a full mapping of DBM activities of international organisations and an exploration of operational evidence on prevention of obesity in LMICs, has the potential to contribute to the halt in the rise of diabetes and obesity as recommended in the WHA target. The link between undernutrition and overnutrition may also be an entry point to advocating with donors to add the DBM to their development agenda.

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Watch Alexandra Rutishauser-Perera's talk on this topic at the TEDx LSHTM: <https://www.youtube.com/watch?v=G7AG-DvobHE>

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Ethiopia's Productive Safety Net Programme: Power, Politics and Practice

Summary of research¹

Location: *Ethiopia*

What we know: The Productive Safety Net Programme (PSNP) is an established, large-scale social protection effort by the Government of Ethiopia targeting rural, food-insecure households.

What this article adds: A recent qualitative study explored the role of power and politics in the PSNP in seven communities in two regional states of Ethiopia. The authors conclude that while there is positive impact, the implementation of the programme is problematic. In these communities, the PSNP was highly politicised, systematically neglected all of the participatory components outlined in the programme design, excluded the feedback mechanisms and entrenched political power. Understanding the existing political climate in operational environments is critical.

Ethiopia has made significant progress in reducing poverty, with a decrease of the population living in poverty from 46% in 2005 to 30% by 2010 (the population increased from 57 to 88 million during the same period). The country has one of the fastest-growing economies in the world; gross domestic product (GDP) was between 8.6 and 13.6% from 2004 to 2016. The Productive Safety Net Programme (PSNP) is one of the Government of Ethiopia's (GoE) most effective programmes to support people living in rural areas, who make up over 80% of the population.

The PSNP began in 2005 to support food-insecure households and enable them to overcome vulnerabilities without eroding their assets, and over time to support households to build assets. In 2015, more than seven million people had been supported by it, with an expected expansion to ten million people. The PSNP is mainly implemented by the GoE, with assistance from development partners. The programme, now in its fourth phase, has been widely studied and

found to have positively impacted food-insecure households. Some studies claim that the impact is modest compared with progress made in comparable non-client households, although even critical assessments point to significant positive change. The PSNP has three key components (see Box 1). A recent study explored the roles of power and politics in the implementation of the PSNP. The authors contrast the plan (the Programme Implementation Manual) with its practice and explore why divergences may be occurring.

Methods

The qualitative research methods involved detailed interviews with clients and former clients of the PSNP, as well as relevant government staff (community leaders, development agents, community health workers and school staff) in seven communities in southern Ethiopia from two regional states. Given political sensitivities in the country, researcher connections were utilised to select communities for the study. These relationships were pivotal in establishing the trust needed to

gain insight that might not otherwise have been shared. Interviews consisted of four group interviews with each community-based government body (in groups of two to six staff members), and 46 key informant interviews with PSNP clients, which were conducted voluntarily and anonymously. A large number of issues were raised by both government staff and community members; this research focused primarily on the common concerns and key discrepancies in the experiences of PSNP clients. Due to regional diversity within Ethiopia, this study was never expected to have great external validity.

Findings

Selection and graduation

- Fair and transparent selection is one of PSNP's core principles, yet current clients and graduates in all the communities voiced

¹ Cochrane, Logan, and Y Tamiru. 2016. Ethiopia's Productive Safety Net Program: Power, Politics and Practice. *Journal of International Development* 28 (5): 649–665. doi:10.1002/jid.3234.

concern regarding the lack of transparency in client selection, and why and how graduation occurs.

- Described in the Manual as “community-based targeting”, in reality local leaders and government staff selected clients without any community participation – a process that resulted in bias, with family members and friends of local leaders gaining entry preference and holding longer terms.

Box 1 Overview of PSNP

Public works programme

Eligible households with able-bodied adults are enrolled on this programme, with work geared towards enhancing infrastructure and enriching community-based resources, such as schools. Public works activities occur for six months each year, during which clients receive a salary based upon household size. Clients are expected to graduate from the programme when they gain sufficient assets.

Direct support programme

Those who are unable to work due to disability, illness or age are enrolled in the direct support programme (payments are for 12 months of the year).

Temporary programme

Temporary clients are pregnant or lactating mothers or caregivers for a malnourished child, who are enrolled in the public works component and temporarily shifted into direct support.

- Selection decisions were also linked to political affiliation, with the exclusion of known opposition party supporters.
- Data supports claims that numbers of graduates are determined at higher levels of government, based on quotas to ‘confirm’ that the programme is successful (i.e. clients are expected to graduate after five years).
- A number of political purposes are at play; the PSNP is being used for political patronage, punishment (clients were graduated for political reasons), and for broader political objectives of meeting regional and national targets.

Lodging an appeal

- According to the Manual, the grievance mechanism is run by an Appeals Committee at the community and district levels, but not one current or former client had heard of this.
- Overlapping responsibilities (i.e. staff likely to be on both committees that select clients as well as theoretical ones that handle appeals) reduce effectiveness.
- Questions were not escalated to higher levels of government due to fear of repercussions; e.g. being labelled as an anti-government agent.

Participation

- The manual states that public works’ programmes should be decided by the community members, but in practice government staff choose and direct group leaders to repair roads, etc. PSNP clients have no participation in the decision-making process.

Work commitment

- There is limited adherence to the per person working cap (no more than 15 days/month per adult household member) set out in the Manual to prevent overburdening clients.
- In practice, each public works client was responsible for working six days per week for six months of the year; also ‘voluntary’ participation in works continued beyond six months (refusal may be equated with political opposition, resulting in exclusion from benefits).
- The Government benefits from lack of adherence to labour caps, as most of the work involves government-run facilities such as schools and roads.

Power tends to corrupt

- There were multiple reports and examples of corruption, e.g. public workers made to farm land belonging to the community chair man, or people with a good relationship with the chairman were enrolled in the PSNP but not required to work.

Discussion

The study authors conclude that the programme has had a large and beneficial impact, but its implementation has been shaped and co-opted to maintain and strengthen political power. Furthermore, the findings challenge donors and practitioners to recognise the ways in which their funding and approaches to programme design are both empowering and disempowering individuals and to better understand the existing political climate in operational environments.

Admission profile and discharge outcomes for infants aged less than six months admitted to inpatient therapeutic care in ten countries

Summary of research¹

Location: Global (Burundi, DRC, Kenya, Liberia, Myanmar, Niger, Somalia, Sudan, Tajikistan, Uganda)

What we know: The burden of acute malnutrition in infants less than six months old is significant; there is a weak evidence base to inform guidance on their management.

What this article adds: A secondary data analysis described the profile and treatment outcomes of 4,002 infants <6mo relative to 20,045 children aged 6-60 months from inpatient therapeutic feeding centres in ten countries. Infants <6mo accounted for 12% of admissions. Infants <6mo had more missing length and MUAC data, weight-for-height that could not be calculated (length <45cm) and nutrition indices that were extreme values. Infants <6mo had a higher relative risk of death, despite a better nutritional profile than older children at admission; this requires cautious interpretation due to the high level of heterogeneity between countries in the dataset. Contextual data on SAM prevalence, disease burden and service quality for infants <6mo was not available. Systematic compilation and analysis of routine data on infants <6mo and research on definition of SAM is needed.

Introduction

Acute malnutrition is a serious global health problem, with wasting affecting 50 million children under five years old and accounting for 11.5% of mortality in this population. An estimated 8.5 million of wasted children are infants aged less than six months (infants <6mo). This high global burden has only recently been recognised, with the inclusion of infants <6mo in the latest World Health Organization (WHO) guidelines for the management of severe acute malnutrition (SAM)². Such recognition needs to be underpinned by developing the evidence base in order to improve care in this age group.

This study describes the profile and outcomes associated with the management of acute malnutrition in infants <6mo under prevailing treatment protocols (pre-2013 WHO guidelines) to expand under-

¹ WHO (2013) *Guideline: Updates on the Management of Severe Acute Malnutrition in Infants and Children*. World Health Organization: Geneva.

² Grijalva-Eternod CS, Kerac M, McGrath M, Wilkinson C, Hirsch JC, Delchevalerie P, and Seal AJ (2016) *Admission profile and discharge outcomes for infants aged less than 6 months admitted to inpatient therapeutic care in 10 countries. A secondary data analysis. Maternal & Child Nutrition*, doi: 10.1111/mcn.12345.



WFP/Laura Mielo

standing about the effectiveness of current care strategies and to provide the baseline evidence to help guide improved future care.

Study methods

A secondary analysis was undertaken of routinely collected and fully anonymised inpatient therapeutic care programme data in ten countries. The data came from an appeal for datasets on acute malnutrition care of infants <6mo. Twenty-three datasets from Action Contre la Faim containing individual-level inpatient therapeutic care programme data from 25,195 children aged 0-60 months from 34 field sites located in 12 countries were sourced. The majority (82%) of children in the study dataset were admitted to therapeutic feeding centres (the remainder were admitted to a day care, home treatment or stabilisation centre). Data from two countries, Afghanistan and Ethiopia (n = 1150), was excluded as their programme data comprised largely infants <6mo and no older children for comparison. A final sample of 24,045 children aged 0-60 months (4,002 infants <6mo; 20,043 6-60 months) from ten countries was used for analysis.

Available data for most children at admission included: age, the presence of bilateral pitting oedema, and anthropometric data (weight, length or height and mid-upper arm circumference (MUAC)). Anthropometric data were also available at discharge. However, there was a large heterogeneity in the type and timing of data collected. As a consequence, this analysis focused only on anthropometric and oedema data at admissions and outcomes at discharge. Discharge outcomes were coded differently within and between datasets: discharge codes were grouped into one of four sphere discharge codes: recovered, died, defaulted and non-recovered.

Data were manipulated and analysed in Stata software. Anthropometry was calculated based on the 2006 WHO Growth Standards. Extreme values were flagged as outliers using commonly applied cleaning criteria (Crowe et al, 2014).

Results

Infants <6mo accounted for 12% of children receiving inpatient therapeutic care for acute

malnutrition. The quality of anthropometric data at admission was more problematic in infants <6mo than in older children. Infants had more missing length (a 6.9 percentage point difference for length values, 95% CI: 6.0, 7.9; $p < 0.01$) and MUAC data, anthropometric measures that could not be converted to indices (a 15.6 percentage point difference for weight-for-length z-score values, 95% CI: 14.3, 16.9; $p < 0.01$, and nutrition indices that were extreme values (a 2.7 percentage point difference for any anthropometric index being flagged as an outlier, 95% CI: 1.7, 3.8; $p < 0.01$).

Infants <6mo had better nutritional status at admission to treatment centres than older children, with lower proportions of oedema and global acute malnutrition (GAM). (A significantly larger proportion of infants <6mo were moderate acute malnutrition (MAM) and a significantly lower proportion were SAM).

A high proportion of both infants <6mo and older children were discharged as recovered. However, infants <6mo showed a greater risk of death during treatment (risk ratio 1.30, 95% CI: 1.09, 1.56; $p < 0.01$ than older children, although there was a high level of variation in the risk ratio between study sites (86.6% variation in risk ratio attributable to heterogeneity; $X^2 = 67.0$ $p < 0.01$).

Discussion and recommendations

To the authors' knowledge, this was the first analysis of programme data from a variety of countries on infants <6mo receiving therapeutic care for acute malnutrition. A key finding is that infants <6mo make up an important proportion of the children in therapeutic feeding programmes run by international relief agencies.

Collecting anthropometric data in infants <6mo was a challenge, highlighted by the greater proportion of missing data at admission, particularly length. MUAC data is not recommended as an admission criterion for infants <6mo, since cut-offs were (and are still not) established for this age group. The WHZ index could not be calculated for a significantly greater proportion of the infants <6mo based on admission anthropometric data; the main

reason that WHZ could not be calculated (467 out of 471 cases) was that infant length was lower than 45 cm, the minimum reference value needed for calculating this index. That a greater number of WHZ were flagged for infants <6mo suggests that further work is necessary to better understand if the cleaning criteria developed for older children should be applied to this younger age group.

Infants <6mo presented a better anthropometric profile than older children at admission to therapeutic care, even after accounting for oedema. Alternative non-anthropometric criteria, such as clinical signs of infection, disability, feeding difficulties and maternal factors, may have been used for admission; an assumption that is supported by a review of admission criteria used for this age group (ENN & CIHD, 2010). The degree to which use of non-anthropometric criteria may have contributed to the better nutritional profile of admissions could not be quantified. Possible explanations for significantly lower oedema amongst infants <6mo are difficulties in diagnosis in this age group, and clinically detectable oedema might only occur after certain developmental milestones.

This analysis found that high proportions of both infants <6mo and older children recover after receiving therapeutic care for acute malnutrition. However, a meta-analysis of the data revealed that infants <6mo have a higher relative risk of death, despite a better nutritional profile at admission; these observations need cautious interpretation due to the high level of heterogeneity between countries in the dataset. These results may reflect differences in the quality of therapeutic care given to infants <6mo and different infant profiles; prevalence of acute malnutrition in the community, disease burden of infants <6mo, and data on service quality were not available. An important limitation is that malnourished infants <6mo may have been under-represented in this study; most programmes were less likely to have actively sought malnourished infants <6mo compared to older children.

This study contributes to the call for prioritising research on how acute malnutrition is defined among infants <6mo, which is fundamental to determining management strategies. The authors conclude that there is an urgent need for monitoring programme performance for infants <6mo involving systematic compilation and analysis of routine data.

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Chronic disease outcomes after SAM in Malawian children (ChroSAM): A cohort study

Summary of research¹

Location: *Malawi*

What we know: Little is known about the long-term health effects of survivors of severe acute malnutrition (SAM), particularly risk of non-communicable diseases (NCDs) in later life.

What this article adds: A cohort of Malawian SAM-survivor children were followed up seven years after inpatient SAM treatment and compared with sibling and community controls. Seven years post-treatment, nearly one-third of discharged cases had died and another 15% were lost to follow-up. SAM survivors had lower height-for-age (HAZ) compared with controls, although with evidence of catch-up growth. Associated functional impairments were found, such as poorer physical strength, poorer physical capacity, and lower school achievement, compared to controls. Results suggest that SAM has long-term adverse effects (patterns of growth associated with future NCDs), but with potential for rehabilitation (evidence of catch-up growth and largely preserved lung and cardiometabolic functions). Recommendations for future follow-ups include establishing the effects of puberty and later dietary or social transitions.

Extensive research links nutrition in early life with adult health and non-communicable diseases (NCDs), a field of research known as developmental origins of health and disease (DOHaD). Most evidence for DOHaD describes associations between in utero or very early postnatal exposures and adult NCD risk. However, it is biologically plausible that early life events such as severe acute malnutrition (SAM) during late infancy or early childhood, and the rapid catch-up growth that occurs during and after treatment, could have long-term health implications.

The chronic disease outcomes after SAM in Malawian children (ChroSAM) study followed up children seven years after they had received SAM inpatient treatment. Researchers investigated the effects of SAM on growth, body composition, functional outcomes and risk factors for NCDs.

Study overview

The original prospective cohort comprised 1,024 patients admitted for SAM treatment at Queen Elizabeth Hospital in Blantyre, Malawi, during a nine-month period (July 2006 to March 2007). All patients were treated with initial inpatient stabilisation using therapeutic milk, followed by nutritional rehabilitation with ready-to-use therapeutic food (RUTF) at home. The median age at admission was 24 months. The ChroSAM study group was made up of 320 surviving children from the original cohort, identified from a one-year post-discharge

follow-up study (n=477). For comparison, the researchers aimed to recruit one sibling control (the sibling closest in age to the case child) and one community control (a child of the same sex and close in age living in the same community) per child in the case group. Children who had been treated for SAM were not eligible as controls.

The study's outcomes of interest included: anthropometry, body composition, lung function, physical capacity (measured as handgrip strength, step test and physical activity), school achievement and blood markers of NCD risk. Multivariate linear regression was used to compare all outcomes, adjusted for age, sex, HIV status and socioeconomic status, as well as puberty in the body composition regression model. Data collectors were not blinded to the case or control status of the children. With 320 cases, 217 sibling controls and 184 community controls, the authors calculated that the study was adequately powered (at least 90% to detect a Z score difference of 0.5 between the cases and controls based on reference data for growth and lung function outcome). The sample size was considered adequate for all outcomes except physical activity (steps per day), which was underpowered.

Results

Of the 1,024 children originally admitted, 238 (23%) died during treatment. At one-year follow-up, 24% of children were known to have died (192/786 of those discharged); an additional

117 were lost to follow-up. Of 398 children traced seven years post-discharge, 46 (11.5%) had died. Thus, of 786 children discharged from SAM treatment, nearly one-third (30%) were known to have died seven years later and another 15% were lost to follow-up. (See Figure 1.)

Key findings show:

- Case children had more severe stunting than controls (adjusted difference vs community controls 0.4, 95% CI 0.6 to 0.2, p=0.001; adjusted difference vs sibling controls 0.2, 0.0 to 0.4, p=0.04), although they showed evidence of catch-up growth.
- These children also had shorter leg length ((adjusted difference vs community controls 2.0 cm, 1.0 to 3.0, p<0.0001; adjusted difference vs sibling controls 1.4 cm, 0.5 to 2.3, p=0.002), but similar sitting height.
- Cases had other body composition differences than controls, including: smaller mid-upper arm circumferences (MUAC) (adjusted difference vs community controls 5.6 mm, 1.9 to 9.4, p=0.001; adjusted difference vs sibling controls 5.7 mm, 2.3 to 9.1, p=0.02); smaller calf circumference (adjusted difference vs community controls 0.49 cm, 0.1 to 0.9, p=0.01; adjusted

¹ Lelijveld, Natasha, Andrew Seal, Jonathan C Wells, Jane Kirkby, Charles Opondo, Emmanuel Chimwezi, James Bunn, et al. 2016. "Chronic Disease Outcomes after Severe Acute Malnutrition in Malawian Children (ChroSAM): A Cohort Study." *The Lancet Global Health* 4 (9) (September 14): e654–e662. doi:10.1016/S2214-109X(16)30133-4.

difference vs sibling controls 0.62 cm, 0.2 to 1.0, $p=0.001$); smaller hip circumference (adjusted difference vs community controls 1.56 cm, 0.5 to 2.7, $p=0.01$; adjusted difference vs sibling controls 1.83 cm, 0.8 to 2.8, $p<0.0001$); and less lean mass (adjusted difference vs community controls -24.5, -43 to -5.5, $p=0.01$; adjusted difference vs sibling controls -11.5, -29 to -6, $p=0.19$).

- Survivors of SAM had functional deficits such as weaker handgrip (adjusted difference vs community controls -1.7 kg, 95% CI -2.4 to -0.9, $p<0.0001$; adjusted difference vs sibling controls 1.01 kg, 0.3 to 1.7, $p=0.005$), and fewer minutes completed of an exercise test (sibling odds ratio [OR] 1.59, 95% CI 1.0 to 2.5, $p=0.04$; community OR 1.59, 95% CI 1.0 to 2.5, $p=0.05$).
- Community and sibling controls were more likely to be in a higher school grade after adjusting for confounders (odds ratio [OR] 1.70, 95% CI 1.2-2.4, $p=0.003$ compared with community controls and OR 2.77, 95% CI 1.9-4.0, $p<0.0001$ compared with sibling controls).

Most of the other NCD risk factors assessed (such as lipid profile and glucose tolerance) were not significantly different between cases and controls, except for diastolic blood pressure, which was higher for cases than for sibling controls (adjusted difference 1.91 mm Hg, $p=0.03$). Amongst cases, 28% were confirmed HIV-positive (compared to 4% in sibling controls and 3% in community controls).

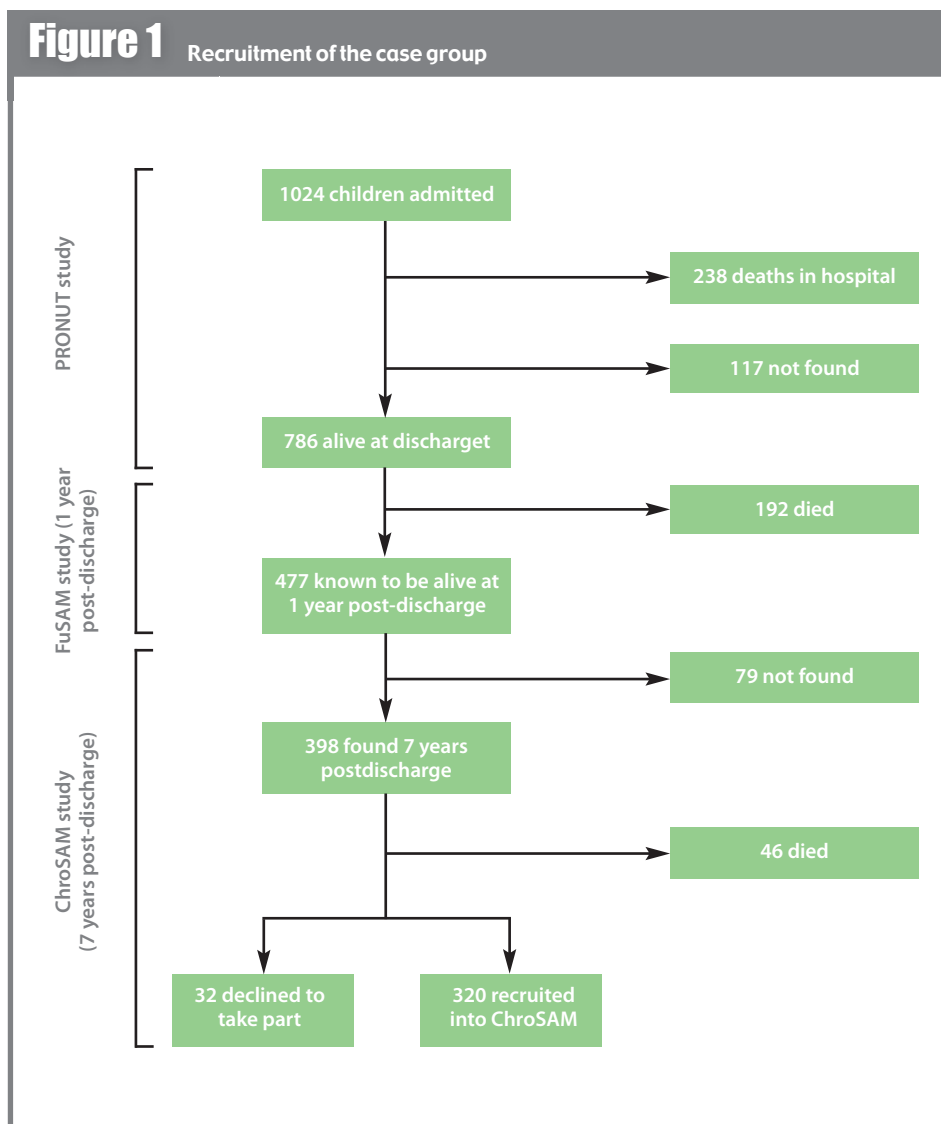
The authors identified a number of limitations to their research, including:

- Survivor bias, since only 352 out of 1,024 children in the original cohort were still alive for this follow-up (30 declined to take part); thus the study selected the fittest and healthiest survivors;
- Sibling and community controls are not fully healthy; and
- The study does not have data on potential confounders, such as exact birthweight and gestational age, which are linked to both SAM and long-term health effects.

Discussion

The results from the study suggest that SAM has long-term adverse effects, especially with regard to mortality, growth and body composition. SAM survivors continue to have significantly more stunting than their siblings and other children in their community at seven years' post-discharge from inpatient nutritional treatment. Associated functional impairments include poorer physical strength, poorer physical capacity, and lower school achievement than controls.

Despite greater stunting among cases, sitting height was similar to controls, suggesting that torso growth had been preserved while limb growth was compromised. Other outcomes such as head circumference were also similar in all groups, while lung function and HbA1c were close to normal when compared with children of African-American origin in all groups. This



Flow diagram showing recruitment, starting with original recruitment in 2006 for the PRONUT study, followed by one-year follow up in the FuSAM study, and the present follow-up (ChroSAM).

suggests that survivors of SAM might have undergone so-called brain-sparing or thrifty growth, whereby the growth of vital organs has been preserved at the cost of less vital growth.

Large sitting-to-standing height ratio, short limb length, lower peripheral mass, and larger waist-to-hip ratio have all been associated with NCDs in adulthood. The pattern of lower lean mass and preservation of fat mass seen in children in the case group is similar to that seen in children born with low birthweight (LBW). This is an important predictor of physical work capacity in later life. The combination of reduced lean mass and greater stunting compared with controls might explain the deficiencies in physical function and strength seen in the SAM survivors. Weaker handgrip is also associated with lower bone mass, impaired cell membrane potential, and reduced muscle function, as well as all-cause early mortality, risk of malnutrition and risk of NCDs.

However, SAM survivors did show signs of growth recovery, with gain in HAZ increasing at a steeper rate in cases who were catching up to their sibling controls. The evidence for catch-

up growth, as well as the apparent preservation of vital organs, suggests the potential for recovery following SAM. Yet case study children remain relatively small (compared with global population for this age), and organ damage might only become apparent when exposed to weight gain and unhealthy lifestyles (as seen in studies of LBW). SAM survivors may face potentially greater NCD risks due to changes in dietary trends in many African countries.

This study found high in-treatment and post-discharge mortality amongst children treated for SAM. The study period preceded the establishment of community-based management of acute malnutrition (CMAM) in Malawi with associated earlier detection of SAM and outpatient care options.

In conclusion, the study suggests that SAM has long-term adverse effects, with survivors showing patterns of 'thrifty growth' associated with future NCDs. Evidence for catch-up growth and preservation of vital organs suggests potential for rehabilitation, but future follow-ups need to focus on how to optimise recovery and minimise any long-term adverse outcomes.

Adolescent nutrition in Mozambique: putting policy into practice

By Erin Homiak

Erin Homiak MPH is seconded to SETSAN Manica as Nutrition Advisor. Her role is funded by UKaid/DFID. She has been working for Concern Worldwide since January 2015 to improve coordination across government and non-government sectors in order to reduce rates of chronic undernutrition amongst women, adolescents and children and to address the root causes of gender inequality to ensure improved nutrition outcomes. Erin has worked in Mozambique since 2013, previously with Helen Keller International on their Vitamin A Supplementation Team.

The research was carried out by the Technical Secretariat for Food Security and Nutrition (SETSAN-P, Manica) Focal Point and the SETSAN Technical Advisor (Nutrition Advisor, Concern Worldwide).

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Romana Cipriano with her daughters Inês and Beatriz at the Chimbadzuo primary school. Romana is the gender advisor for the school council. She makes sure girls stay in school and provides support for other health and sanitation needs.

Kieron Crawley, Manica, Mozambique.

Location: Mozambique

What we know: Adolescents are typically not targeted in health and nutrition services; this has implications for health outcomes across generations.

What this article adds: A recent review examined the extent to which national policy on adolescent nutrition (targeting anaemia control, reduced early pregnancy and nutritional education) is being implemented in Manica province, Mozambique. It found few interventions in the province target adolescents; a gap in service implementation of the Ministry of Health's unit for adolescents (SAAJ) services; and underuse of established platforms to improve SAAJ access. Recommendations to inform nutrition programming at national, provincial and district levels include defining female adolescents as a separate target group; including pregnancy reduction in nutrition programmes that aim to reduce chronic undernutrition; designing a strategy to address early child marriage and engage men; targeting marginalised adolescents; and using existing outreach and service provision platforms to full capacity.

Global context

Adolescents are an underserved population; their needs are not reflected in services (Hainsworth et al, 2009; Save the Children, 2015; Patton et al, 2014) and interventions do not define or target adolescents who are often perceived as a healthy or low-risk group (Save the Children, 2015). Poor care-seeking behaviour due to individual and structural barriers (Temin & Levine, 2009) and stigma around family planning and use of the health system hinder service access and delivery (Temin & Levine, 2009). Lack of evidence makes policy decisions difficult; what does exist indicates that failure to target adolescents has major implications for health outcomes. Adolescent females are more likely to give birth to babies with low birth weight or who are small for gestational age and children who are more likely to become stunted and in turn give birth to small babies, thus perpetuating an intergenerational cycle of chronic undernutrition (Save the Children, 2015). Neglecting adolescent health means child mortality rates and maternal health will remain relatively unchanged (Sawyer et al, 2012).

Little is known about the micronutrient deficiencies at the population level in Mozambique (Korkalo et al, 2014), although we do know that 54% of girls and women between the ages of 15 and 49 are anaemic (Ministerio da Saúde (MISAU) et al, 2011). Teenage HIV infection rates suggest that the health needs of adolescents are not being addressed; young people (<25 years) account for 60% of new HIV infections and young women (20 to 24 years old) are infected at a rate triple that of men the same age (Hainsworth et al, 2009), highlighting the need to address the root causes of gender inequality. Adolescent pregnancy rate is high in Mozambique at 44.4% in rural and 33.2% in urban areas (UNICEF, 2015); early marriage is one of the strongest drivers.

Under the Scaling Up Nutrition (SUN) Movement 1,000 days window of opportunity (Black et al, 2013), the pre-conception phase is not taken into account, which often coincides with adolescence. While the 1,000-day framework encompasses adolescent pregnancies, attention to prevention of pregnancy and early

marriage is also needed, using a life-cycle approach to inform programme design and implementation. Programmes that address adolescent nutrition will help realise the SUN objective to increase exclusive breastfeeding (adolescents are 33% less likely to breastfeed); reduce maternal and neonatal mortality; and decrease stunting (Save the Children, 2015; Temin & Levine, 2009).

A recent review set out to understand the extent to which national policy regarding adolescent nutrition is being implemented in Manica province, Mozambique. The aim of the review was to assist the provincial authority in advocating for an expansion of current delivery channels serving adolescents and to raise their profile among the development community as an important demographic to focus on and invest in. Key findings are summarised here.

Context of Mozambique

The first objective of Mozambique's Multi-Sectoral Action Plan for the Reduction of Chronic Malnutrition (PAMRDC) (Republic of Mozambique, 2010) specifically aims to improve the

nutritional status of adolescent girls aged 10-19 (ibid, 2010). The PAMRDC is a guiding framework designed by multiple ministries and civil society partners and is monitored by SET-SAN at national and provincial levels. The framework includes seven objectives, all with defined impact results, for the reduction of chronic malnutrition.

Serviços Amigos dos Adolescentes e Jovens (SAAJ) is the unit in the Ministry of Health providing public health services to adolescent males and females. The Department for Youth and Sports is the only other provincial PAMRDC partner that targets adolescents. At provincial level, SAAJ consists of one Focal Point located in the provincial capital who is responsible for the oversight of all the district-level service provision. There is an established, country-wide mechanism of peer-to-peer activists (Geração Biz), created to increase the number of adolescents who access SAAJ services with the ultimate goal of addressing the sexual and reproductive health (SRH) needs of male and female adolescents. The activists are trained and supervised by SAAJ, the Department of Education, and the Department of Youth and Sports.

Method

The study used qualitative and quantitative research methods, including key informant interviews (KIIs) and review of secondary sources, including a literature review. Participatory observations of service provision of adolescent (SAAJ) health services in three district-level facilities in Manica Province (Guro, Tambara and Manica) and training of peer-to-peer activists (Geração Biz) in Gondola district were undertaken. KIIs were conducted with the provincial SAAJ Focal Point in Manica; SAAJ health providers in Guro, Tambara, and Manica districts; the provincial Focal Point for the Ministry of Education; and several agencies including Pathfinder International, Save the Children, FHI360, CARE, UNICEF and the UN Food and Agriculture Organization (FAO).

Results

Under strategic objective 1 of the PAMRDC, there are three defined results. Evidence was gathered on the degree to which the results were being met, as follows:

Result 1.1: Controlled anaemia in adolescents (10-19 years) within and outside schools

In Manica province, iron supplementation is implemented through health clinics and mobile brigades. Mobile brigades do not specifically target adolescents in remote communities to receive iron supplementations or family planning, and until 2015 the adolescent target group for health clinics was 15-19 year-old females (rather than 10-19 year-olds)¹.

Result 1.2: Reduced early pregnancy in adolescents (10-19 years)

Family planning for adolescents is implemented through the health post; again, adolescents are

not specifically targeted by the mobile brigades. SAAJ in Manica was given technical support through UNFPA from 2005 until 2013 and subsequent support from Save the Children² from 2015 in two of 11 districts in Manica Province (including training of activists, service providers and teachers and materials provision) in a two-year pilot programme funded by the Norwegian Government. There are Geração Biz activists in the district schools, but only two districts have received refresher trainings (with the support of Save the Children). Lack of resources limits further rollout.

Result 1.3: Strengthened nutrition education in different education levels as part of school curriculum, including literacy curricula

There is a national curriculum that includes a nutrition component, which is implemented at primary school level. FAO is supporting the training of teachers in nutrition in three districts of Manica province.

This snapshot from Manica shows adolescent nutrition and health is being addressed to some extent, and there are many opportunities to continue and increase the inclusion of adolescents in public health interventions. At the national level, several organisations, including Pathfinder International, UNFPA and UNICEF, work in adolescent health, focusing on SRH but not taking account of nutrition. It is important to note that there may be interventions addressing adolescent nutrition in Mozambique that have not been captured in this review.

Discussion and recommendations

The findings presented demonstrate a lack of targeting and attention to adolescent nutrition within programmes that aim to improve nutrition in Manica province, despite national policy. The review recognises the challenge for provinces to keep in constant connection with the nutrition and policy community that is centralised in Maputo. On a positive front, Mozambique is 'ahead of the game' with regard to having an adolescent nutrition policy, which non-governmental organisations (NGOs) and partners use as a framework to align programmes. Furthermore, the PAMRDC is multi-sectoral and includes the health, education and agricultural sectors (Republic of Mozambique, 2010; Save the Children, 2015). There are promising entry points with existing programmes.

Mozambique will not see a reduction in chronic undernutrition unless adolescent health and nutrition is prioritised. A paradigm shift is needed in the way populations are targeted, taking into consideration the life-cycle approach, including adolescents in target groups and not waiting for adolescent girls to become pregnant before engaging with them and key influencers of early marriage (Concern Worldwide, March 2014).

To translate this framework into the action it merits, the following recommendations are made:

- Nutrition interventions should define female adolescents as a separate target group whose

- needs are different from adult women. Interventions that define indicators specific to adolescents will generate data to inform services and interventions in the future.
- The ambition to reduce pregnancy rates in female adolescents should be mainstreamed into nutrition programmes that seek to reduce chronic undernutrition, taking gender into account and engaging men.
- All outreach mechanisms should address early child marriage to align with Mozambique's National Strategy for the Prevention and Elimination of Early Marriage adopted by the national Government in 2015. This includes engaging men, recognising that there are many determining factors that affect early marriage.
- The current delivery platform, Geração Biz, should be utilised to full capacity in order to increase care-seeking behaviour and ensure access to SAAJ services.
- Interventions should be equitable; female adolescents who are not in school and who are likely to be most marginalised require alternative community outreach programmes, such as youth care groups, youth centres and vocational training (Roche, 2015; Save the Children, 2015).

For more information, contact info@concern.net

The full report is available at: <https://www.concern.net/resources/adolescent-nutrition-missing-link-life-cycle-approach>.

¹ Dionisio Oliveira (SAAJ), conversation with author, 8 April 2015

² Isabel Mateo (Save the Children), conversation with author, 12 June 2015.

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Robust evidence for an evidence-based approach to humanitarian action

By Mike Clarke, Jeroen Jansen and Claire Allen



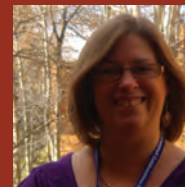
Mike Clarke is one of the founders of Evidence Aid and is now voluntary Research Director and Chair of the Board of Trustees. He has extensive experience in the evaluation of health

and social care and is Director of the Northern Ireland Hub for Trials Methodology Research at Queen's University, Belfast. He has worked on some of the largest randomised trials in specific areas of health and on dozens of systematic reviews in a wide range of areas, with a strong interest in increasing capacity for the conduct and use of systematic reviews. He facilitates trainings on systematic reviews for Evidence Aid.



Jeroen Jansen is the Director of Evidence Aid. He has been engaged in a wide variety of sectors, issues and working environments, mostly in management positions.

He worked for Médecins Sans Frontières (MSF) in Afghanistan, Liberia, Darfur and several other contexts. He has been successfully employed in the private sector, managing the deployment of humanitarian aid and working as a department head for MSF in the UK. Formerly an engineer, he later obtained a Masters in International Human Rights Law and worked for Marie Stopes International.



Claire Allen is the part-time Operations Manager for Evidence Aid. She worked for Cochrane for 18

years and has a B.A. (Hons) in Communication, Media and Culture. Claire's background is in administration and finance. Her main tasks relate to the overall operations of Evidence Aid, including management of information to ensure that evidence is available in a readily accessible format.

The increasing demand for 'value for money', proof of impact and effectiveness in the provision of humanitarian aid requires that decisions and activities become more evidence-based. Reliable and robust evidence will help those making decisions and choices, and those developing policies and standards, to know which interventions work, which don't work and which remain unproven. For those interventions that work, people need to know how effective they are and for whom, so that they can choose the most appropriate and effective intervention in a specific context. Only with reliable and robust evidence is it possible to maximise the impact, efficiency ('value for money') and effectiveness of humanitarian action and ensure more good than harm is done.

Evidence Aid¹ engages with those guiding the humanitarian sector to inspire and enable them to apply a more evidence-based approach to their decisions and actions. Through this engagement, and by working with others who generate, disseminate and apply evidence, a large and growing audience is revealed that supports a more evidence-based approach to humanitarian action. A momentum is building, similar to what has happened in the healthcare sector since the latter decades of the twentieth century (Clarke, 2015), generating a demand for robust evidence. One of the challenges is that this audience has a wide range of interpretations regarding what reliable and robust evidence entails.

When it comes to identifying and using findings of research to decide what is likely to do more good than harm, the healthcare sector recognises the need for evidence to come from a synthesis of similar studies, often in a systematic review. These evidence syntheses provide users with a critically appraised summary of the relevant research on a topic, allowing the existing studies to be compared, contrasted and combined

to provide the knowledge needed to resolve uncertainties. In this way, systematic reviews provide the vehicle by which evidence from earlier research can be brought together in ways that minimise bias, avoid undue emphasis on individual studies, maximise the power of research that has already been done, and minimise waste from unnecessary duplication or inadequate uptake.

Systematic reviews begin with a focused question and clear eligibility criteria, then seek out and appraise the relevant studies and compare, contrast and, where relevant and possible, combine their findings. They provide decision-makers and others making choices with a summary of the available evidence, which they can consider alongside other information, such as local values and resources, before taking action. An up-to-date, systematic review allows well-informed decisions to be taken quicker and eases the evidence-gathering burden for people who need to take these decisions. The value of systematic reviews is widely recognised in healthcare, and the concept of drawing on the totality of evidence when making decisions is neither new nor outlandish when explained to practitioners, patients, policy-makers and the public. This should be no different for disasters and other humanitarian emergencies (Gerdin et al, 2014). Just as happened in the healthcare sector several decades ago, the growing need and support for an evidence-based approach in the humanitarian sector should result in a growing need for robust evidence and an increase in the investment required to generate and disseminate this evidence.

Despite a growing momentum for an evidence-based approach in the humanitarian sector, progress seems limited by a strong sense of tradition, an antipathy to change and continuing misapplication of 'expert opinion' or 'best practice'. Key documents in the sector, such as guidelines and policies, continue to be predominantly based

on 'expert opinion' and 'best practice', although this is changing as key influencers that straddle the humanitarian and healthcare sectors, such as the World Health Organisation (WHO), emphasise the need to underpin their guidance with systematic reviews. (See, for example, the ongoing work on a guideline for major radiation emergencies (Carr et al, 2016) and a systematic review of accessibility in the home for an upcoming WHO guideline on healthy housing (Cho et al, 2016)). This does not imply an unthinking adoption of evidence synthesis as a recipe for decision-making. There are situations where the use of 'expert opinion' or 'best practice' is justified, just as an evidence-based approach, based on robust evidence, should only be applied when and where appropriate. Nevertheless, it is important that the humanitarian sector recognises the limits of 'expert opinion' and 'best practice' and the value of an approach based on evidence synthesis.

Expert opinion is a valuable tool when applied appropriately, but applied inappropriately it can cause considerable harm, getting in the way of effective action or promoting the use of ineffective or harmful actions. William J. Sutherland and Mark Burgman (2015) described the pitfalls of applying expert opinion rather well in the journal *Nature*. They assert that the "accuracy and reliability of expert opinions is ... compromised by a long list of cognitive frailties (Tversky & Kahneman, 1982). Estimates are influenced by experts' values, mood, whether they stand to gain or lose from a decision (Englich & Soder, 2009), and by the context in which their opinions are sought. Experts are typically unaware of these subjective influences. They are often highly credible, yet they vastly overestimate their own objectivity and the reliability of their peers (Burgman et al, 2011)." This does not render 'expert opinion' use-

¹ www.evidenceaid.org/

less, but demands a certain degree of care when engaging experts and a need for awareness of the tools available to counter these pitfalls.

An example of the appropriate use of expert opinion is in determining the gaps in the evidence base and prioritising the filling of those gaps. The identification of gaps in evidence in the humanitarian sector is important for minimising unnecessary overlap of activities and waste of resources. Evidence Aid held a priority setting meeting in 2013, bringing together those who influence and guide the humanitarian sector, and published the output in the journal *PLOS Currents: Disasters* (EAPSG, 2013).

Thirty high-priority research questions were identified under ten themes that could be addressed by systematic reviews in the area of planning for or responding to natural disasters, humanitarian crises or other major healthcare emergencies. Some of these gaps have already been taken up by the Humanitarian Evidence Programme² and others, and relevant systematic reviews will appear in coming months and years. As these new reviews are done, they will be added to the more than 250 systematic reviews that are already freely available from the Evidence Aid resources³.

Another concept frequently applied in the context of decision-making in humanitarian response is 'best practice'. On The Guardian Global Development Professionals Network page, an anonymous blogger asserts that "best practices are those things that we've somehow managed to figure out actually work, and work well" or "is

something that we know works and is worth repeating"⁴. The variety of definitions of concepts such as best practice is one of the common problems in the humanitarian sector. However, potentially even more problematic is the fact that the blogger, like many others in the sector, does not reveal what their criteria are for something to 'work' and how it was established that any particular practice adheres to these criteria. As with 'expert opinion', the application of a transparent methodology to determine what 'works' would overcome most of the hurdles, allowing specific interventions, actions and strategies to be proven to be effective or efficient to the satisfaction of decision-makers.

Proper evaluations can provide evidence of the impact of a certain project or practice. Key to this is the application of an appropriate methodology, such as promoted by the Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP)⁵. Nevertheless, an evaluation of one project only reveals something about the impact in that particular context and does not allow us to derive strong conclusions about the likely effects of a similar project in a different context. Just as the successful treatment of one patient or the positive findings of one clinical trial in the healthcare sector do not provide any certainty that it will work for others, we need a synthesis of the evaluations of similar projects to determine the likelihood of success in another place and time. Recognition of this in the healthcare sector helped the drive towards evidence synthesis and systematic reviews as a means to bring together all the available evidence.

Evidence syntheses, or systematic reviews, of reliable evaluations should be a key source of knowledge for all decision-makers who want to answer the question: What is likely to happen if we do this, rather than something else? In the humanitarian sector, decisions, choices and policies impact on the health and wellbeing of thousands, if not millions, of people and those responsible have a duty to ensure that the evidence they use is reliable and robust. This requires the use of appropriate methodologies; firstly to evaluate humanitarian action, and then to bring together the findings of those evaluations. It will mean that the best possible use is made of what happened in the past to predict what will happen in the future, and ensure that humanitarian action does what those who fund it and those who implement it want it to do: prevent and alleviate the suffering of people in need in humanitarian and disaster risk reduction contexts.

The next two courses *An introduction to systematic reviews in the humanitarian sector*, led by Mike Clarke, are to be held on 16 November in Washington DC, USA and on 30 November in Oxford, UK. The cost is £225/person. For more information, contact: Claire Allen, email: callen@evidenceaid.org or visit <http://www.evidenceaid.org/>

² www.oxfam.org.uk/hep
³ www.evidenceaid.org/resources
⁴ www.theguardian.com/global-development-professionals-network/2015/jul/22/as-aid-gets-better-it-gets-more-boring-and-thats-as-it-should-be; last visited 15 August 2016.
⁵ www.alnap.org/

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Evidence in humanitarian emergencies: What does it look like?

By Jeremy Shoham and Marie McGrath, Field Exchange co-editors

ENN was invited by Evidence Aid to share our perspective regarding evidence in emergencies in their online blog. Below is a comment posted in September 2016, www.evidenceaid.org/evidence-in-humanitarian-emergencies-what-does-it-look-like

Over 20 years, ENN has published Field Exchange to help achieve our purpose of strengthening the evidence and know-how for effective nutrition interventions in countries prone to crisis and high levels of malnutrition. It provides the experiences of those implementing nutrition programmes in acute and protracted emergencies. Most of these experiences and lessons learnt would not have been captured or disseminated without this type of non-peer reviewed publication. Yet, for many, Field Exchange, and equivalent publications are the 'grey' literature, often seen as a source of findings that are 'plausible' but not evidenced. Hence the question, what is evidence and what does it look like – especially in humanitarian contexts?

The few reviews of evidence in humanitarian nutrition programming show that there is very little ‘probabilistic’ evidence out there. Randomised trials that are held up as the “gold standard” for assessing the effects of interventions are particularly difficult to mount in humanitarian contexts. They require foresight and investment by donors; early collaboration between pragmatic, creative academics and operational agencies; and long term commitment to plan, deliver and publish. And, many of them do not come cheap. Even where randomised trials are carried out (mostly in secure settings), they don’t necessarily tell us whether something will work or not in the complex environment and ‘ever shifting sands’ of an emergency or, critically, how it works. This is a key uncertainty for programmers looking to adapt and respond to the needs of specific populations and contexts.

There are also challenges around the global coordination of ‘robust’ research. Research agendas are not shared between research institutions and there is competition for scarce resources – even (shamefully) amongst research groups in the same research consortium. The culture around research is often ‘secretive’ and conflict of interests are not always apparent.

However, the fact that there is a gap in the evidence doesn’t stop programming. Agencies on the ground still need to respond, innovate and adapt,

guided by what they know or suspect works, influenced by agency strengths, sometimes driven by donor interests and sadly, often underpinned by the bureaucratic imperative that the implementing agency must, itself, survive. The intention though is always worthy – to alleviate suffering.

On the positive side, ENN has witnessed (and, through Field Exchange, has captured and disseminated) innovation, programme development and learning. Seen as a non-governmental organisation with no vested interest other than to reflect learning, multiple agencies have shared programming experiences through Field Exchange, documenting perceived and measured successes and failures. This provides a collective memory and exchange – and evidence of sorts – of what works and what doesn’t work. The process of experience capture is cathartic for many. It helps them unpack and reflect, enabling both personal and agency reflection and learning. It has also helped identify where urgent ‘robust’ research is needed. The impact on programming and research of this collective experience has been substantial, not least on ENN’s research and reviews (www.enonline.net/ourwork).

Should we aspire to more? Absolutely. We need more randomised trials, complemented by theories of change, to help explain how and when interventions are likely to impact nutrition. We also need institutional changes which allow

for more of these studies to be done in challenging contexts. The current architecture makes such research very difficult. At the same time, we need to continue to capture the kind of ‘evidence’ provided by practitioners, which is critical to shining a light on programme performance, and to identify where greater institutional coherence and joined up thinking is needed.

A great example is the special edition of Field Exchange on the Syria nutrition response in 2014 that documented detailed case studies of more than 60 programmes (www.enonline.net/fex/48). This single publication has had a significant impact on international guidance around infant feeding in emergencies, the need for policies on non-communicable diseases (NCDs) in emergencies and generated a considerable research focus on how to address high levels of stunting in protracted crises.

In conclusion, evidence is not just generated by academic researchers, statisticians and the like but also by those at the sharp end of programming. Many of those at the sharp end may well need to brush up on their epidemiology, just as many professional researchers may need to familiarise themselves with the complex circumstances of humanitarian crises and the unique insights of the implementers on how the programming they are intimately involved in is playing out on the ground.

Recovery rate of children with moderate acute malnutrition treated with ready-to-use supplementary food (RUSF) or improved corn-soya blend (CSB+)

Summary of research¹

Location: *Cameroon*

What we know: A wide range of nutritional products are currently used to treat MAM; there is no definitive consensus on the most effective products to use.

What this article adds: A controlled randomised trial compared an improved CSB (CSB+) treatment with a ready-to-use supplementary food (RUSF) treatment to treat MAM. Eighty-one MAM children aged 25-59 months were enrolled and received a daily ration (50% energy) for 56 days. Fortnightly follow-up involved nutrition and general health counselling, clinical assessment and anthropometry. Recovery was good (85% in RUSF group, 73% in CSB+ group) and was not significantly different between groups. Higher weight gain in the RUSF arm (similar total energy was provided to both groups) may be due to the different nutrient contents of the products, cooking requirements and lower energy density of CSB. Fifteen per cent of RUSF group and 20% of SAM group did not recover after 56 days; 3% and 5% respectively deteriorated to SAM. Nutrition education may have improved outcomes in this study.

Moderate and severe wasting are acute forms of undernutrition; children suffering from them face a markedly increased risk of death. It is estimated that moderate acute malnutrition (MAM) and severe acute malnutrition (SAM) affect 52 million children under five years of age worldwide. Supplementary feeding programmes (SFPs) are designed to treat MAM and prevent progression from MAM to SAM, and thus have the potential to reduce child mortality and morbidity. A wide range of nutritional products are currently used to treat MAM. These include fortified blended flours, especially corn-soya blend (CSB) prepared as porridge; BP5 biscuits; and lipid-based nutrient supplements, in particular therapeutic and ready-to-use supplements (RUTF and RUSF). Product formulation and quantities used have varied in published effectiveness studies; therefore there is no definitive consensus on the most effective products to use in MAM treatment.

¹ Medoua GN, Ntsama PM, Ndzana ACA, Essa’a VJ, Tsafack JJT and Dimodi HT. (2016) *Recovery rate of children with moderate acute malnutrition treated with ready-to-use supplementary food (RUSF) or improved corn-soya blend (CSB+): a randomized controlled trial*, Public Health Nutrition, 19(2), pp. 363–370. doi: 10.1017/S1368980015001238.



Gabriel Nama Medoua, Cameroon

CSB being prepared for distribution

The purpose of this study was to compare an improved CSB (CSB+) with an RUSF programme in the treatment of MAM to test the hypothesis that supplementary foods given at complementary dose (about 50% of the child's energy requirement) result in high recovery rates (assuming the remaining energy requirements can be met through the usual household diet). The study was a comparative effectiveness trial that assessed the treatment of MAM in children for a period of 56 days, using a controlled randomised design with parallel assignment for CSB+ or RUSF.

Eight hundred and thirty-three children aged 6-59 months living in the health districts of Mvog-Beti (urban area) or Evoudoula (rural area) in the Centre region of Cameroon were screened for eligibility. Children were excluded if they did not have appetite, had a chronic debilitating illness, or had a history of peanut allergy. Eighty-one children aged 25-59 months with MAM (WHZ <-2 and ≥ -3 without oedema) were enrolled in the study from February to July 2012. Allocation to either CSB+ or RUSF groups was performed by caregivers drawing from an opaque bag containing coded numbers corresponding to one of the two supplementary foods. The code was accessible only to the food distributor. Investigators and nutrition educators were blinded to the child's assigned food group.

On enrolment, children were examined by a paediatrician to assess their health status and de-wormed (500mg mebendazole). Caregivers were interviewed regarding the child's socio-demographic characteristics and to assess household food-consumption score. Nutrition and general health counselling and information about the illness of their children and the benefit of supplementary feeding were provided to all caregivers. Every child received a daily ration of 167 kJ (40 kcal)/kg body weight for 56 days, provided as two-week rations every fortnight.

Each caregiver also received nutrition and general health counselling at enrolment and at every follow-up visit, and was instructed to continue to feed children their usual diet along with the supplementary food as 'medicine'. At each follow-up visit, caregivers reported on the child's clinical symptoms and tolerance of the study food; anthropometric measurements and nutrition education were repeated. Additional supplementary food was continued for those who remained wasted. Standard methods for anthropometric measurements were used; anthropometric indices (weight-for-age Z score (WHZ), weight-for-age Z score (WAZ) and height-for-age Z score (HAZ)) were based on WHO 2006 Child Growth Standards.

The study found no significant differences between the malnutrition profile of CSB+ and RUSF groups: all the children enrolled in the study were moderately wasted, moderately underweight and moderately stunted. No adverse reactions to any of the foods were reported. After 56 days of treatment, 85% of children recovered from MAM in the RUSF group (95% CI 73%, 97%) and 73% in the CSB+ group (95% CI 59%, 87%). The mean duration of treatment required to achieve recovery was 44 days in the RUSF group and 51 days in the CSB+ group. There was no significant difference (P=0.276) in the recovery rate between the two groups (Fisher's exact test). A non-response rate of 20% among children in the CSB+ group and 15% in the RUSF group was observed; thus these children remained moderately malnourished following 56 days of treatment. Of children in the RUSF and CSB+ groups, 3% and 5% respectively deteriorated to SAM. Children who received RUSF showed higher rates of weight gain compared with those receiving CSB+ (P<0.05).

The observed recovery rates suggest that both products were relatively successful in treatment of MAM in children, comparable to or

relatively higher than those found in previous studies, despite the lower quantity of supplement provided to children. The authors suggest that this could be a reflection of the investment in education of caregivers on how best to use foods available in the house, since educational interventions have been shown to improve child-feeding practices. This suggests that, in the context of moderate food insecurity, nutrition education could improve the outcomes of supplementary feeding and reduce the quantity of supplement generally provided.

The authors suggest that the higher weight gain in the RUSF arm (despite similar total energy provided to both groups) may be due to the different nutrient contents of the products, the fact that RUSF does not require cooking, and the lower energy density of CSB+ (a child must eat eight times the mass of supplement compared to RUSF). This may have affected the global dietary intake of the children and might account for the lower weight gain and recovery rate in the CSB+ group. In Cameroon, as in most African countries, national protocols for the management of MAM recommend the use of large doses of fortified blended flours, which are usually imported. Based on the average time required for treatment in both groups and the cost of both products, the overall cost to treat a child with CSB+ (3.48 euros) was relatively lower than the cost with RUSF (3.52 euros). This calculation does not include transport, storage or staffing costs. If considering the operational limits of CSB+ requiring preparation, RUSF could be a more cost-effective choice.

The authors conclude that both CSB+ and RUSF were relatively successful for the treatment of MAM in children. Despite the relatively low ration size provided, the recovery rates observed for both groups were comparable to or higher than those reported in previous studies, a probable effect of nutrition education.



Gabriel Nama Medoua, Cameroon

RUSF in production

Impact of child support grant in South Africa on child nutrition

Summary of research¹

Location: South Africa

What we know: Stunting is an indicator of chronic undernutrition and is often linked to poverty-related factors. There is mixed evidence on the impact of cash on reducing child undernutrition in low- and middle-income settings

What this article adds: In South Africa, the Child Support Grant (CSG) is the largest cash transfer programme targeting children from poor households. A recent paper explored predictors of stunting, including exposure to the CSG, at a median age of 22 months among children from three diverse areas of South Africa. CSG receipt for 18 months or longer was not associated with stunting after controlling for risk factors such as HIV exposure status and low birth weight; higher levels of maternal education had a protective effect on stunting. An association found between mothers' HIV-positive status and stunting supports previous research findings. Food-price inflation and limited progress in the provision of other important interventions and social services, in the context of high unemployment, have likely limited nutrition impact of the CSG.

In South Africa, child under-five mortality was estimated to be 45 per 1,000 live births in 2012. There has been a significant drop in reported child hunger (from 30% of all children in 2002 to 16% in 2006), but in 2010 three million children were still living in households where hunger was reported. Moreover, 27% of the country's under-fives were stunted in 2009, a decrease from 33% in 2003.

Existing policy responses to childhood poverty and vulnerability in developing countries include the provision of basic services such as education, healthcare, clean water, in-kind transfers (such as school-feeding schemes and nutritional supplements) and, more recently, cash transfers. The Child Support Grant (CSG) is the largest cash transfer programme in the country and the continent, reaching more than 11 million children from poor households in 2013. The grant is unconditional, means-tested and non-contributory, with a small amount (R320/US\$32 per month) transferred by the South African government to children of poor families. However, children living in the poorest households target group still report high rates of hunger (26%) compared with children in the wealthiest households (less than 1%).

Methods

A recent cross-sectional study assessed the uptake and duration of receipt of the CSG and nutritional outcomes in children at two years of age (i.e. median age 22 months) during 2008. The sampling frame was participants from the sites of a multi-country, cluster-randomised, intervention trial undertaken from 2005 to 2008 (the PROMISE-EBF trial to assess the effectiveness of community-based workers in promoting and improving exclusive breastfeeding). After that trial ended (2007), a new cross-sectional study (the present one) was conducted, with participants from the trial traced when the children were aged between nine months and three years. A total of 871 out of 1,148 participants were traced, with 746 participants ultimately included.

The study was conducted in three diverse areas in South Africa:

(i) Peri-urban Paarl, a town with a population

of about 130,000 in Western Cape Province; (ii) Rural Rietvlei, which falls under the Umzimkhulu Municipality in KwaZulu-Natal; and (iii) Umlazi, an urban township in Durban with a population of 550,000 inhabitants.

In terms of key child-health outcomes, Paarl fares better than the other two sites, with an infant mortality rate of 30/1,000 live birth, compared with Umlazi (68/1,000 live births) and Rietvlei (99/1,000 live births); and an antenatal HIV prevalence of 7% compared with Umlazi's 47% and Rietvlei's 28%. Umlazi is the largest township in KwaZulu-Natal Province, with typical township problems, including severe housing shortages, high rates of unemployment and crime and little economic development. Rietvlei is a predominantly rural area where 90% of people live below the household subsistence level, much higher than the national average of 65%.

The main outcome of interest was stunting (height-for-age z score (HAZ) <-2). Grant receipt was defined as mother being in receipt of the CSG on behalf of the index child at any point during the study (12 weeks, 24 weeks and two years). Duration of CSG receipt, the primary exposure, was defined as the age of child (in months) at the two-year visit minus the child's age (in months) at first reported receipt of the grant.

The researchers extracted baseline socio-demographic characteristics (socio-economic status, mother's educational level, geographical area, maternal age, marital status), maternal HIV status and exclusive breastfeeding status at 12 weeks of age from the PROMISE-EBF trial data set for the 746 children traced for the present study. Regression analysis was used to assess confounding factors.

Results

Socio-economic characteristics and status varied across the three sites. The mean age of mothers was similar in Umlazi and Rietvlei (23.9 and 24.0 years, respectively) and slightly older in Paarl (24.9 years). The prevalence of HIV amongst mothers was 5.9% in Paarl, 8.1% in Rietvlei and 28.2% in Umlazi. Educational levels of mothers were lower

in Rietvlei. Household income also differed across the three sites, with a median US\$100 per month in Paarl and Umlazi and US\$78 per month in Rietvlei. Most of the mothers in Umlazi were single (85%), as was the case in Paarl (68%), while most mothers in Rietvlei were married (68%). Rietvlei had the highest proportion (70%) of participants who were in the poorest quintile; in Umlazi, no participants fell within that quintile and Paarl had 3%. Paarl had the highest proportion of participants who were in the least poor quintile (34%), Umlazi had 31% and Rietvlei had none.

For two years of child age, Rietvlei had the lowest rates of CSG receipt (28%) compared with Paarl (38%) and Umlazi (34%). High rates of stunting were observed in all three sites, with Umlazi being the most affected (28%) compared with Rietvlei (20%) and Paarl (17%). Duration of CSG receipt had no effect on stunting, after adjusting for confounders. Both HIV-positive status of the mother (adjusted OR=2.30; 95% CI 1.31, 4.03) and low birth weight (adjusted OR=2.01; 95% CI 1.02, 3.96) were associated with more than double the probability of the child being stunted. Completing high school or having a tertiary education was associated with a 58% and 84% reduction in child stunting respectively. Being from Umlazi was associated with a nearly fourfold increase in probability of stunting (adjusted OR=3.89; 95% CI 2.30, 6.59).

Discussion

CSG receipt for 18 months or longer in this study population was not associated with stunting after controlling for important risk factors such as HIV-exposure status and low birth weight, and indicated higher levels of education as having a protective effect on stunting. The strong correlation between stunting and being from Umlazi is likely explained by the high prevalence of HIV in this site. The authors suggest several reasons for the apparent lack of association between CSG receipt and stunting in households. The CSG is often introduced in the context of high unemployment rates, where it becomes the only source of income in many households. The value of the grant has not been keeping up with inflation rates; at US\$32 per month, it is a small amount in the context of rising food prices and unemployment. To maximise the potential positive impact of cash transfers, their cash value should be linked to food-price movements and the cost of essential non-food items, and their value adjusted for household size.

The authors conclude that cash transfers need to work in tandem with other poverty alleviation measures such as education, housing and access to quality healthcare in order to maximise their impact on child-health outcomes such as stunting. Findings suggest that in South Africa the effect of the cash transfer on nutritional status may have been eroded by food-price inflation and limited progress in the provision of other important social and environmental services. These findings add weight to calls for changes in the CSG allocation to be pegged to the inflation rate and to be based on the cost of raising a child.

¹ Zembe-Mkabile W, Ramokolo V, Sanders D, Jackson D & Doherty T (2016). *The dynamic relationship between cash transfers and child health: can the child support grant in South Africa make a difference to child nutrition?* Public Health Nutrition, 19(2), 356-362. doi.org/10.1017/S1368980015001147.

Public health nutrition capacity: The quality of workforce for scaling up nutrition programmes

Summary of research¹



WFP/Berta Ilmantaite

Location: *Global*

What we know: Priority for scaling up multi-sector programmes to tackle undernutrition in LMICs is growing. Public health nutrition (PHN) workforce capacity is critical to programme delivery.

What this article adds: A position paper by the World Public Health Nutrition Association (WPHNA) Capacity Building Task Force describes existing nutrition workforce capacity and potential mechanisms for building capacity (considering workforce size, organisation, and pre-service and in-service training) in LMICs. Nutrition-specific interventions are mostly delivered through health services that depend on decent staff ratios; community health workers are critical for impact. Guidance on multi-sector nutrition programming at scale is scarce, and estimates (where they exist) of PHN workforce numbers suggest they are inadequate. Applicable pre-service nutrition training is mostly clinical and/or food-science oriented; tools for in-service nutrition training largely relate to infant and young child nutrition and food security. Increased priority and funding for building capacity for scaling up nutrition is needed to realise global targets.

Introduction

Overnutrition and undernutrition problems affect at least half the global population, especially those in low and middle-income countries (LMICs). Programme guidance exists for undernutrition and overnutrition; priority for scaling up multi-sector programmes to tackle undernutrition in these contexts is growing. A position paper by members of the World Public Health Nutrition Association (WPHNA) Capacity Building Task Force outlines the case for and defines the desirable characteristics of a system for developing the capacity of nutrition workforces for scaling up nutrition programmes in LMICs especially. It uses evidence from the literature and the joint experience of the Task Force to describe the existing nutrition workforce capacity and the potential mechanisms for building capacity. The World Health Assembly (WHA) has urged that member states should include a comprehensive approach to capacity building and workforce development in implementing plans for maternal, infant and young child nutrition, with the capacity indicator being the number of nutrition professionals per 100,000 population.

Key findings on the public health nutrition workforce

Nutrition programmes

Nutrition-specific interventions for reducing maternal and child undernutrition are mostly delivered through the health sector, while nu-

trition-sensitive interventions are delivered through other sectors such as education, agriculture, water and sanitation, and social welfare. Much less consensus has been created around interventions needed to reduce overnutrition. The importance of employing multi-sector approaches has been widely agreed, but documented experience of how such programmes are implemented is quite rare, with little or no guidance existing on how to develop and manage such programmes.

Many countries report having national, multi-sector nutrition plans, but very few of them are actually being implemented at any scale. Community-based health and nutrition programmes can be very successful, especially if they have the essential elements of community ownership, adequate population coverage, targeting, and central support for supplies and training.

To achieve impact requires a certain level of intensity of effort, with optimal ratios of not more than 20 mobilisers, or community health workers (CHWs) per facilitator/supervisor and not more than 20 households per mobiliser. CHW volunteers typically receive some locally organised cascade training in order to be able to carry out their work, often from trainers who do not themselves have capacity to train health workers; there does not appear to be any national or international standard for these. Recent reviews confirm that CHWs provide a critical

link between communities and health and social services and are effective at implementing evidence-based interventions.

Workforce structure

An ideal PHN structure includes a pyramid (see Figure 1), where the specialist PHN manager should have oversight of the delivery of all curative and preventive nutrition interventions delivered through the health system in the district. The delivery of such interventions is typically done by others, including nurses, midwives, dietitians and doctors. They in turn may provide support to other district actors, including CHWs, teachers, agricultural extension workers and social workers.

Workforce size

Few estimates of PHN specialist numbers exist, but all suggest that they are either insufficient and/or largely missing in most national nutrition/health workforces. A recent survey of 13 countries in West Africa detected a critical shortage of skilled nutrition professionals in all countries, with limited supervision of nutrition activities, especially at implementation level by front-line health workers. Doctors, nurses and midwives (as well as dietitians in some

¹ Shrimpton, R., du Plessis, L.M., Delisle, H., Blaney, S., Atwood, S.J., Sanders, D., Margetts, B. and Hughes, R. (2016) *Public health nutrition capacity: assuring the quality of workforce preparation for scaling up nutrition programmes*, Public Health Nutrition, 19(11), pp. 2,090–2,100. doi: 10.1017/S136898001500378X.

countries) make up the majority of workers currently entrusted to deliver nutrition interventions globally, but training is particularly poor. For example, Asian regional country case studies (UNICEF and the WPHNA) concluded that the nutritional knowledge of health workers was outdated; their nutrition competencies were limited to more clinical and curative activities; and for nurses and midwives especially, their job descriptions did not include nutrition responsibilities. These findings are not surprising, since even in the USA and the UK the nutrition content of nurses' and medical doctors' training is also considered outdated and inadequate.

There is a lack of a dedicated workforce (especially in the health system) in most LMICs to provide outreach for community-based nutrition services. Scaling up CHWs was considered a crucial part of achieving the Millennium Development Goals (MDGs), but this did not happen.

Workforce organisation

Organisational difficulties are as great a hurdle to scaling up nutrition actions as the lack of PHN specialists, although the two are interrelated. No programme guidance exists that discusses dimensions of multi-sector nutrition programme governance; e.g. the need for a PHN specialist at all levels – in local government district planning office; in the central unit of each sector to oversee district-level implementation; and in the central unit to help plan, budget and oversee development.

None of the countries studied had in place a unified nutrition information system that could

guide decision-making processes for the double burden of malnutrition across the different sectors and levels of government.

A key challenge for scaling up community-based programmes is institutionalising and mainstreaming community participation. The largest and most successful programme is the Brazilian Family Health Programme, which has integrated 250,000 CHWs into its health services and institutionalised community health committees as part of municipal health services.

Workforce preparation

There does not seem to be any authoritative source of information (either regional or global) for graduate courses on nutrition. Programmes identified in a survey of nutrition education in West Africa found that all of them failed to provide a comprehensive coverage of all essential aspects of human nutrition, being heavily oriented to food science (46%), with little emphasis on PHN (24%) or overnutrition (2%).

On-the-job training to develop the workforce to act in nutrition at scale will obviously require new and/or unconventional methods; e.g. a mix of distance learning and periodic coming together with tutors and mentors, which are both economically and logistically feasible.

Considerable material is available for in-service training of health-sector workers in the nutrition actions needed to improve maternal and child undernutrition; e.g. generic tools (such as counselling cards) for programming and capacity development of community-based infant

and young child feeding (IYCF) counselling developed by UNICEF. FAO has also developed e-learning courses for professionals working in food and nutrition security, social and economic development, and sustainable management of natural resources.

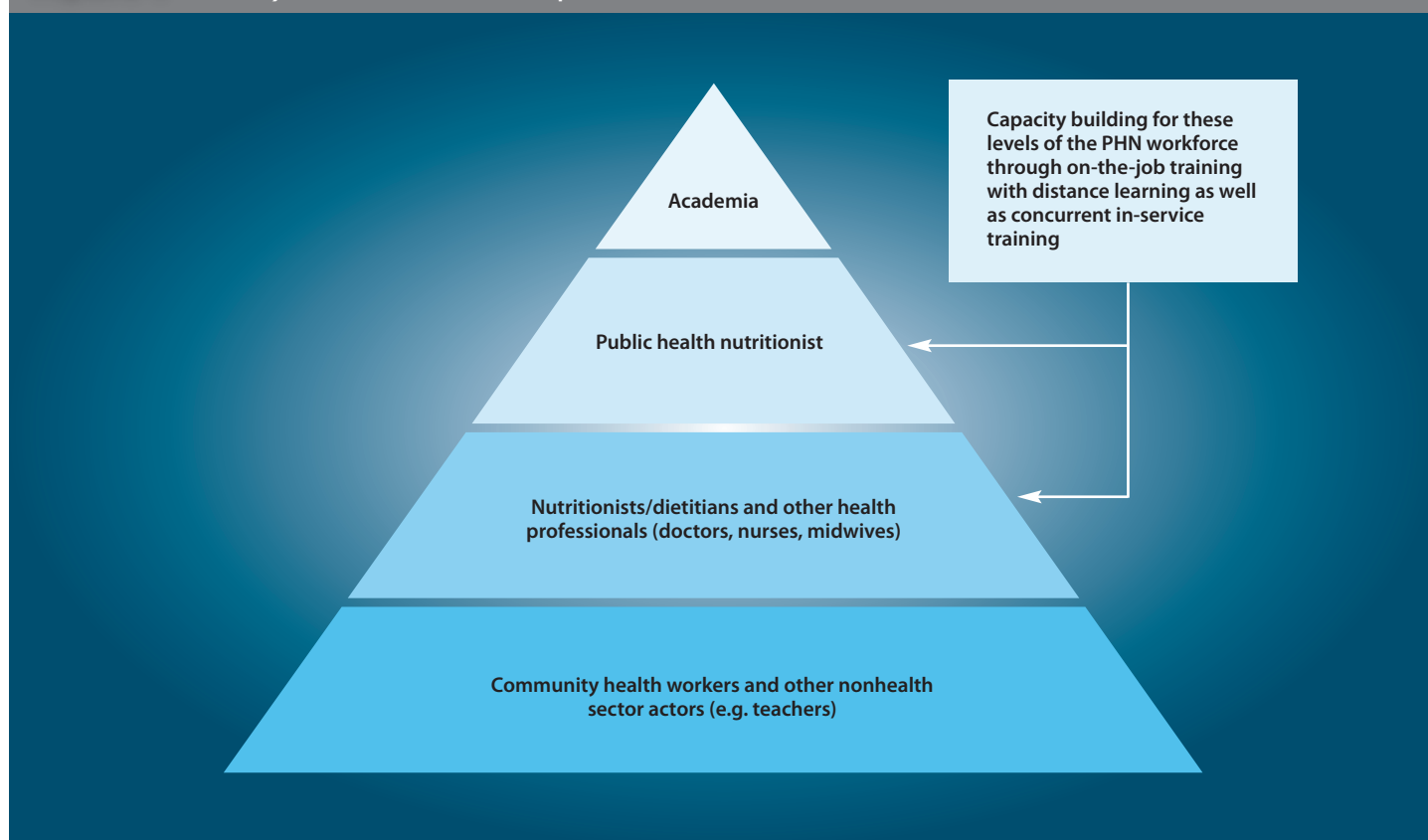
Continuing professional development is another important area to be considered when developing the PHN workforce. Some universities offer online continuing education courses for nutrition and health-care professionals; e.g. the London School of Hygiene and Tropical Medicine's distance learning course on multi-sector nutrition programming.

Improved availability of the internet has revolutionised the possibilities for capacity building in PHN. Initiatives include the Public Nutrition Virtual University (still awaiting funding) and the eNutrition Academy, a global nutrition-training platform (courses are still in development). Mentoring, defined as 'a reciprocal, mutual and supportive learning relationship', is one more tool that should be used to strengthen workforce development in PHN.

Conclusions

Unless increased priority and funding is given to building capacity for scaling up nutrition programmes in LMICs, maternal and child undernutrition rates are likely to remain high and nutrition-related non-communicable diseases are likely to escalate. A hybrid, distance-learning model for in-service training of PHN workforce managers is urgently needed in LMICs.

Figure 1 Multi-layered PHN workforce development



Research priorities on the relationship between wasting and stunting

Summary of research¹

Location: *Global*

What we know: There is global momentum to bring down levels of undernutrition. Wasting and stunting frequently co-exist, but are often considered separately.

What this article adds: A research prioritisation was conducted to investigate the relationships between wasting and stunting, using the CHNRI (Child Health and Nutrition Research Initiative) methodology. A group of 18 experts in nutrition, growth and child health prioritised 30 research questions against three criteria (answerability, usefulness and impact). There was strong support for prioritisation of research related to interventions and programming that can impact on both wasting and stunting. Greater commitment from funders, academics and implementing agencies is needed to carry out clinical trials or large-scale programmatic evaluations, with robust research design.

Background

Wasting affects 52 million (19 million severe wasting) and stunting affects 165 million children under five years old each year. Wasting and stunting frequently co-exist in the same population (sometimes in the same child), but they are usually separated in terms of policy, guidance, programming and financing. Both forms of undernutrition share causal factors such as infectious diseases, poor diet and suboptimal infant feeding and caring practices, yet the physiological relationship between them and how interventions for one affect the other are poorly understood. Consequently, there is a need for a closer look at how children experience both wasting and stunting over time, and how to sharpen programming focus (particularly on prevention) to achieve impacts for both. This research aimed to establish research priorities to fill critical gaps in this area and to guide future research investments.

Study methods

The authors used the Child Health and Nutrition Research Initiative (CHNRI) methodology for setting research priorities. The method enables individual experts to systematically develop possible research questions by scoring them against pre-defined criteria. It was agreed to use an existing Technical Interest Group (TIG) facilitated by ENN, comprising 25 individuals from a range of organisations (including academia and non-governmental organisations (NGOs)) with expertise in research and programming for wasting and stunting.

The resulting list of possible questions was then refined using a recommended theoretical framework with a set of criteria with which to judge the questions. The criteria were reduced to three in order to encourage as many experts

as possible to complete the survey. These were:

Answerability: Was the research question well framed, with well defined end points, and likely to gain ethical approval?

Usefulness: Would the intervention that would be developed/improved through this research be deliverable, effective and efficacious?

Impact: Would the research endpoints for this question have high impact (i.e. the capacity to remove 5% or more of the disease burden)?

Thirty research questions were tabled against each of the three criteria, which formed an online survey with a total of 90 queries. All TIG members were sent a link to the online survey and invited to take part. Each of the 30 research questions received three scores, one for each criterion ranging between 0-100%. The overall research priority score (RPS) was calculated as a mean of all three priority scores so that the priority of research questions was ranked accordingly.

Findings

Of the 25 TIG members, 18 (72%) took part in the survey, with 16 completing it in full. Most respondents were academics (n=10); some were engaged in operations and programming (n=3); one worked primarily in policy; while others declared involvement in a mix of these activities (n=4).

The highest ranking questions were:

1. “*Can interventions outside of the 1,000 days, e.g. pre-school, school-age and adolescence, lead to catch-up in height and in other developmental markers?*” This question scored very highly against all three judging criteria.
2. “*What timely interventions work to*

mitigate seasonal peaks in undernutrition (both wasting and stunting)?” This scored particularly highly against ‘answerability’.

3. “*What is the optimal formulation of Ready to Use Therapeutic Food (RUTF) to promote optimal ponderal growth and also support linear growth during and after severe acute malnutrition (SAM) recovery?*” This question scored highly against the ‘usefulness’ criteria.
4. “*What is the role of pre-pregnancy nutritional status in determining risk of being born stunted and/or wasted?*”
5. “*What are the effective packages of interventions for both maternal nutrition and new-born outcomes?*”

Eight of the top ten questions (including the top three) were categorised as ‘research for the development of new interventions/to improve existing interventions’, showing that the group prioritised research that directly related to programming and public health, rather than epidemiological research.

Discussion

The strong support for prioritisation of research related to interventions and programming, as found in this CHNRI exercise, reflects the complexity of underlying causes of wasting and stunting; outcomes that cannot necessarily be predicted from observational research alone. Moving this agenda forward needs greater commitment from funders, academics and implementing agencies to carry out clinical trials or large-scale programmatic evaluations. These must have rigorous designs, adequate sample sizes, and follow-up for health outcomes.

Question 1: “*Can interventions outside of the 1,000 days, e.g. pre-school, school-age and adolescence, lead to catch-up in height and in other developmental markers?*”

This area has had little attention but could have important implications; for example with adolescent girls where the evidence shows that maternal stature may predict a child’s size at birth. The timing of interventions to promote catch-up growth in mid-childhood and adolescence is not well understood, but may be important. The group identified further investigation of other lifecycle opportunities (apart from the first 1,000 days), particularly those concerned with adolescent growth, as potentially crucial for meeting undernutrition targets.

Question 2: “*What timely interventions work to mitigate seasonal peaks in undernutrition (both wasting and stunting)?*”

A number of countries have strong seasonal patterns of stunting and wasting that may illustrate some correlation between the two forms of undernutrition, but there are many unanswered questions in this area. Recent trials have shown the provision of seasonal nutritional supplementation in Niger to have

¹ Z Angood C, Khara T, Dolan C, Berkley JA, WaSt Technical Interest Group (2016) Research Priorities on the Relationship between Wasting and Stunting. PLoS ONE 11(5): e0153221. doi: 10.1371/journal.pone.0153221.

effects on both wasting and stunting (Isanaka et al, 2008). The prioritisation of this question is a call for future studies to measure both wasting and stunting.

Question 3: “What is the optimal formulation of RUTF to promote optimal ponderal growth and also support linear growth during and after SAM recovery?”

This question reflects the fact that few studies of SAM or moderate acute malnutrition (MAM) treatment have looked at linear growth during or after treatment, or compared different formulations of RUTF in trials of adequate size. Where such studies exist, findings suggest no positive effect of RUTF on stunting. However, there is evidence that linear growth ceases or slows down during periods of wasting; therefore timing of restarting linear growth and how to support this during treatment for wasting was

considered to be a research priority by this expert group.

Questions 4 and 5: “What is the role of pre-pregnancy nutritional status in determining risk of being born stunted and/or wasted?” and “What are the effective packages of interventions for both maternal nutrition and new-born outcomes?”

There is an increasing call for research on pre-conceptual interventions for improving maternal pre-pregnancy Body Mass Index (BMI), and that can influence adult height in order to benefit foetal growth. Other investigations into support for maternal nutrition could help programmers break the inter-generational cycle of undernutrition.

The study’s main weakness was that a relatively small number of experts were involved in setting

the research priorities, and most of these were academics from Western institutions. However, given that the global pool of experts in the field is also small, the results were still regarded as a useful guide for research investment. High-priority research questions are those where trial interventions can inform the appropriate timing of treatment and prevention to impact on both wasting and stunting.

Reference

Isanaka et al, 2008. Isanaka S, Nombela N, Djibo A, Poupard M, Van Beckhoven D, Gaboulaud V, et al. Effect of preventive supplementation with ready-to-use therapeutic food on the nutritional status, mortality, and morbidity of children aged 6 to 60 months in Niger: a cluster randomized trial. *Jama*. 2009;301(3):277–85. doi: 10.1001/jama.2008.1018 pmid:19155454; PubMed Central PMCID: PMC3144630.

Co-trimoxazole prophylaxis to prevent mortality in children with complicated severe acute malnutrition

Summary of research¹

Location: *Kenya*

What we know: Children with complicated severe acute malnutrition (SAM) are at high risk of infection. Daily co-trimoxazole prophylaxis is effective in reducing mortality and preventing admissions in HIV-infected children.

What this article adds: A randomised, placebo-controlled trial in four Kenyan hospitals assessed the efficacy of daily co-trimoxazole prophylaxis for six months on survival in children aged 60 days to 59 months without HIV treated for complicated SAM. Daily co-trimoxazole did not reduce mortality (14% in co-trimoxazole group; 15% in placebo group) or improve growth, but did result in a lower incidence of both malaria and some bacterial infections. Mortality rate among infants aged two to 11 months was particularly high, despite follow-up. Results suggest children with complicated SAM, especially infants, remain susceptible to severe infections and death, despite follow-up. Findings suggest fundamental differences in the immunopathology of malnutrition and HIV infection that require further investigation.

Children with complicated severe acute malnutrition (SAM)² require initial hospital treatment with antibiotics, treatment of specific medical conditions, and specialised therapeutic feeding. Complicated SAM is associated with high inpatient mortality; even post-discharge, ‘recovered’ SAM children remain at increased risk of death most likely due to infectious disease. Daily co-trimoxazole prophylaxis has been found to reduce mortality and hospital admissions in children with HIV who are susceptible to infection, protecting against malaria, pneumonia and sepsis. It also prevents pneumonia in children with measles and recurrent urinary tract infections. A systematic review found that antimicrobials, including co-trimoxazole, had beneficial effects on ponderal and linear growth in children, pos-

sibly by reducing inflammation and preventing or treating infections. The drug is inexpensive and widely available, with a known safety profile. However, long-term use of antibiotics can potentially cause toxicity and resistance.

This study tested the hypothesis that daily co-trimoxazole would reduce mortality and morbidity and improve nutritional recovery in children without HIV being treated for complicated SAM.

Method

A multicentre, double-blind, randomised, placebo-controlled study was conducted in four hospitals in Kenya (two rural hospitals in Kilifi and Malindi and two urban hospitals in Mombasa and Nairobi) with children aged 60 days to 59

months without HIV admitted to hospital and diagnosed with SAM. All study hospitals provided inpatient care for SAM and therapeutic and supplementary feeding clinics.

Children were randomly assigned to six months of either daily oral co-trimoxazole prophylaxis (given as water-dispersible tablets: 120 mg per day for age <6 months; 240 mg per day for age six months to five years); or matching placebo. Assignment was done with computer-generated randomisation. Treatment allocation was concealed in opaque, sealed envelopes; patients, families and all trial staff were masked to treatment assignment. The dose regimen of co-trimoxazole was that recommended by WHO for HIV care. Children were given recommended medical care and feeding and followed up for 12 months.

The primary outcome was mortality during the 365 days of the study period. Secondary outcomes were frequency of readmission to hospital and illness episodes treated as an outpatient. Scheduled follow-up to enrolment was once each

¹ Berkley, James A, Moses Ngari, Johnstone Thitiri, Laura Mwalekwa, Molline Timbwa, Fauzat Hamid, Rehema Ali, et al. 2016. *Daily Co-Trimoxazole Prophylaxis to Prevent Mortality in Children with Complicated Severe Acute Malnutrition: A Multicentre, Double-Blind, Randomised Placebo-Controlled Trial*. *The Lancet Global Health* 4 (7) (October 4): e464–e473. doi: 10.1016/S2214-109X(16)30096-1.

² Complicated SAM is defined as children who have signs of infection or present with one or more Integrated Management of Childhood Illness danger signs (see references) or do not pass an appetite test.

month for the first six months, then every two months for the second six months. Anthropometric measurements were taken at each visit and remaining study drugs and empty blister packs were counted to assess adherence. A full blood count was done at enrolment, two, six and 12 months. Analysis was by intention to treat.

Findings

A total of 1,778 eligible children were recruited and assigned to treatment (887 to co-trimoxazole prophylaxis and 891 to placebo) between 20 November 2009 and 14 March 2013. Median age was 11 months (IQR 7-16 months); 306 (17%) were younger than six months; 300 (17%) had oedematous malnutrition (kwashiorkor); and 1,221 (69%) were stunted (length-for-age Z score < -2).

During 1,527 child-years of observation (CYO), 257 deaths occurred (14%, 16.8 per 100 CYO; 95% CI 14.9-19.0); 60 (23%) of which occurred during the index admission; 64 (25%) during a readmission to a study hospital; 29 (11%) in other hospitals; and 104 (40%) in the community. Mortality did not differ between the groups: 122 (14%) of 887 children in the co-trimoxazole group died, compared with 135 (15%) of 891 in the placebo group.

There were 616 non-fatal admissions to hospital and 3,266 non-fatal episodes of illness for which children were treated as outpatients. No significant differences in the overall rates of

hospital admission or outpatient illness were noted between intervention groups. The frequency of pneumonia episodes was similar between groups, but diarrhoea occurred more frequently in the group assigned to co-trimoxazole. Other infections such as skin or soft tissue and urinary tract, as well as malaria, were less frequent in the co-trimoxazole group.

After 12 months, 1,209 (68%) of 1,778 children enrolled were alive and in follow-up with a mid upper arm circumference (MUAC) above the threshold for moderate acute malnutrition (≥ 12.5 cm). However, this outcome varied with age, ranging from 160 (52%) of 306 infants younger than six months at enrolment to 154 (78%) of 197 children aged 24 months or more at enrolment, $p < 0.0001$.

Discussion

The authors conclude that daily co-trimoxazole given for six months to a trial group of Kenyan children with complicated SAM (but without HIV) did not reduce mortality or improve growth. However, it did result in a lower incidence of malaria and some bacterial infections. Findings suggest that children with complicated SAM remain susceptible to severe infections and death after discharge from hospital, despite medical care and follow-up, with a rate of readmissions to hospital or death of 57 per 100 CYO. Mortality rates among infants aged two to 11 months were much higher than national mortality estimates (22 per 100 CYO, compared to 1.7 per

100 CYO among infants aged one to 11 months reported in the 2014 Kenya Demographic & Health Survey).

The study results raise a number of questions:

- Did low bacterial susceptibility to co-trimoxazole contribute to an absence of protective effect against death? If so, this has implications for the use of co-trimoxazole prophylaxis in HIV-infected children.
- Although the bacteria found in blood and urine samples were largely non-susceptible to co-trimoxazole, the drug did prevent two bacterial conditions, namely urinary tract and skin and soft tissue infections. Absence of efficacy in this trial compared to those of children with HIV suggests fundamental differences in the immunopathology of malnutrition and HIV infection, their associated infections and interaction with antimicrobials.
- Few positive blood cultures were found during the trial, despite high numbers of death and readmission and a high prevalence of antimicrobial resistance. Results raise the possibility that a substantial proportion of serious infection might not have been bacterial.

The paper concludes by suggesting that tackling SAM requires better understanding of infections (both its causes and determinants of susceptibility), and other strategies need to be tested in clinical trials to reduce deaths in this population group.

The impact of intensive counselling and a mass media campaign on complementary feeding practices and child growth in Bangladesh

Summary of research¹

Location: *Bangladesh*

What we know: In Bangladesh there has been little to no progress in improving children's diets and little evidence available on what works to improve maternal knowledge and practices related to complementary feeding (CF).

What this article adds: A cluster-randomised impact evaluation compared the impact of two 'Alive and Thrive' intervention packages (one intensive, one less intensive) on CF practices and anthropometric outcomes, delivered at scale (1.7 million mothers in 50 sub-districts) over a four-year period. A cross-sectional household survey of feeding practices (6-23.9 months) and stunting prevalence (24-47.9 months) was conducted at baseline and endline. Core WHO CF indicators improved over time ($P < 0.0001$ for all indicators) in both groups. For all CF indicators except timely introduction of solid, semi-solid or soft foods, the increases were significantly higher in the intensive group and achieved levels were high. Stunting declined significantly in all children 24-47.9 months of age and did not differ significantly between groups. In conclusion, intensive intervention had substantial and significant impact on CF: evidence that behaviour-change interventions can be implemented at scale.

Bangladesh has made dramatic health advances for its population over the last two decades and is hailed as a remarkable health success story. However, rates of stunting and wasting remain high; in 2014 an estimated 36% of children were stunted and 14% wasted. Between 2011 and 2014 stunting reduced nationally by 4 percentage points (pp); wasting declined by only 1pp in the last 10 years. Appropriate infant and young child feeding (IYCF) practices are a critical component of optimal child growth and development. This includes exclusive breastfeeding until six months of age and the provision of safe and nutritionally rich foods in sufficient quantity in addition to breastmilk from 6 to 23 months of age. In Bangladesh, although rates of exclusive

¹ Menon, P., Nguyen, P.H., Saha, K.K., Khaled, A., Sanghvi, T., Baker, J., Afsana, K. et al. (2016) *Combining Intensive Counseling by Frontline Workers with a Nationwide Mass Media Campaign Has Large Differential Impacts on Complementary Feeding Practices but Not on Child Growth: Results of a Cluster-Randomized Program Evaluation in Bangladesh*. Journal of Nutrition. Published ahead of print August 31, 2016 as doi: 10.3945/jn.116.232314.

breastfeeding increased to an estimated 55% in 2014, there has been little to no progress in improving children's diets, with only 23% consuming a minimally acceptable diet. There is currently little evidence available on what works to improve maternal knowledge and practices related to complementary feeding (CF), how these changes in turn lead to positive child outcomes, and what factors enable successful scale-up of these interventions.

This paper reports on findings from a cluster-randomised impact evaluation of an at-scale programme in Bangladesh. The objectives of the evaluation were to compare the impact of two 'Alive and Thrive' intervention packages on CF practices and anthropometric outcomes. The first intervention package involved intensified interpersonal counselling (IPC), a mass media campaign (MM), and community mobilisation (CM); the second package involved standard nutrition counselling, less intensive MM and non-intensive CM. The programme model reached a large scale, with an estimated 1.7 million mothers of children under two years old in 50 sub-districts.

Interventions

IPC (both intensive and standard) was delivered by a large non-governmental organisation (NGO) in 50 rural sub-districts through its existing countrywide essential healthcare programme. Standard IPC involved routine home visits through which information on IYCF practices were delivered. In intensive areas, a new cadre of nutrition-focused frontline workers conducted multiple age-targeted IYCF-focused counselling visits to households with pregnant women and mothers of children under two years of age, coached mothers as they tried out the practices, and engaged other family members to support the behaviours.

The MM component, implemented in both intensive and non-intensive areas, consisted of the national broadcast of seven television spots

that targeted mothers, family members, health workers and local doctors with messages on various aspects of IYCF, three of which were focused on CF. In intensive areas with low electricity and limited access to television, local video screenings of the television broadcasts and other IYCF films produced by the project were used. In intensive areas, CM included sensitisation of community leaders to IYCF and community theatre shows focused on IYCF. In non-intensive areas, CM was less structured and covered general healthcare topics and did not include IYCF-related information.

Evaluation method

A cluster-randomised, non-blinded impact evaluation design was used to compare the impact of the two intervention packages. A cross-sectional household survey was conducted at baseline (2010) and exactly four years later (2014) in the same communities in households with children 0-47.9 months of age ($n=600$ children 6-23.9 months of age and $n=1,090$ 24-47.9 months of age at baseline (2010); $n=500$ children 6-23.9 months and $n=1,100$ children 24-47.9 months at endline (2014)). Primary outcomes measured were CF practices in children 6-23.9 months of age and the prevalence of stunting in children 24-47.9 months of age. Five CF indicators were examined using 24 hour recall of the mother/caregiver: 1) minimum dietary diversity; 2) minimum meal frequency as appropriate for age and breastfeeding status; 3) minimum acceptable diet (defined as breastfeeding and achievement of numbers 1 and 2); 4) consumption of iron-rich or iron-fortified food; and 5) timely introduction of solid, semi-solid or soft foods. Anthropometric data were collected using standard methods by trained field staff. Difference-in-difference impact estimates (DDEs) were derived, i.e. the effect of the intensified versus standard programme adjusting for geographic clustering, infant age, sex, differences in baseline characteristics, and differential change in characteristics over time.

Results

Results showed that the groups were similar at baseline. The levels of all core WHO CF indicators improved over time ($P < 0.0001$ for all indicators) in both the intensive and non-intensive groups. For all CF indicators except timely introduction of solid, semi-solid, or soft foods, the increases were significantly higher in the intensive groups. The DDEs of programme impact were 16.3 pp, 14.7 pp, 22.0 pp, and 24.6 pp for minimum dietary diversity, minimum meal frequency, minimum acceptable diet, and consumption of iron-rich foods, respectively. All DDEs were statistically significant in adjusted models. Achieved levels of CF indicators in the intensive areas were high, ranging from 50.4% for minimum acceptable diet to 63.8% for minimum diet diversity, 75.1% for minimum meal frequency, and 78.5% for consumption of iron-rich foods. There was also a significant differential shift between groups from early and late introduction of water and other foods to a more well-timed introduction between the ages of 6 and 8.9 months. These programme impacts were large and significant, ranging from 16 to 39 pp for different foods. The shift was primarily from early to timely introduction for water, rice, and semi-solid foods, and from late to timely introduction for animal source foods (ASFs) and other foods.

Stunting declined significantly in children 24-47.9 months of age in both groups between baseline and endline, by 5.2 pp in the non-intensive and 6.3 pp in the intensive group. The declines in the prevalence of stunting did not differ between groups. A similar pattern was observed for the proportion of children classified as being underweight (decline of 5.2pp in the non-intensive, 6.6pp in the intensive) and wasted (decline of 1.4pp in non-intensive and 2.5 in intensive).

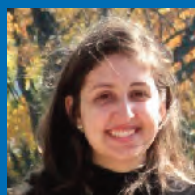
Conclusions

The results show that a programme providing intensified IPC, MM, and CM (the 'Alive and Thrive' intensive intervention) at scale had a substantial and significant impact on several CF practices in comparison with changes observed with a less intensive behaviour-change intervention in Bangladesh. Large-scale programme delivery was feasible and, with the use of multiple platforms, reached 1.7 million households. Although improvements in child growth were observed in both groups and for all age groups over time, the DDEs for linear growth and stunting at 24-47.9 months were not statistically significant and therefore cannot be attributed to the intensified interventions. The authors suggest that non-differential impacts on stunting were likely due to rapid positive secular trends in Bangladesh and the further acceleration of linear growth requires accompanying interventions. The authors conclude that this study offers compelling evidence that behaviour-change interventions can be implemented at scale to deliver impact on what remains a substantial global challenge: improving children's diets.



Alive and Thrive, Bangladesh, 2010

Direct procurement from family farms for national school feeding programme in Brazil



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This article describes the preliminary investigation directed by Professor Betzabeth Slater. The authors gratefully acknowledge the Foundation for Research of the State of São Paulo (FAPESP) for funding this work.

Location: *Brazil*

What we know: Brazilian legislation obligates minimum purchase levels of food from family farms to supply the National School Feeding Programme (PNAE) when using federal funds.

What this article adds: A cross-sectional study of 40 municipalities in São Paulo, Brazil, suggested an upward trend in the proportion of municipalities procuring family-farmed food for the PNAE from 47% to 67.5%. Purchases are largely local, from individual farmers, farming associations and cooperatives. Challenges remain when it comes to the successful implementation of policy; political will, government support and the organisational efficiency of the family farmers involved may impact on the success of local procurement.

In June 2009, the Federal Government of Brazil passed legislation (Law 11,947/2009) which regulates the National School Feeding Programme (PNAE) and consolidates its links with family farms (FFs). Under the legislation, at least 30% of all funds which the federal government transfers to States and municipalities must be used to buy food from FFs, and a bidding process is not required. A recent study found that 47% of municipalities in the State of São Paulo had bought food from FFs at least once between June 2009 and August 2011 (Slater et al, 2013). This confirms that local procurement for the PNAE had not yet been implemented in all the municipalities analysed. The implementation of local procurement is known to be a complex process involving different sectors and levels of government and demands coordinated action. Consequently, the aim of this study was to check the percentage of direct procurement from FFs for the PNAE in the State of São Paulo in 2012 and describe the main features of the process.

Method

A cross-sectional survey was conducted in São Paulo in 2012 as part of a research project to assess the level of implementation of direct procurement from FFs for the PNAE (Slater, 2011). The survey was based on a probability sample of 40 municipalities. A structured questionnaire was completed (telephone or email) by a civil servant in the school meals management department of each municipal council.

The direct procurement of food from FFs for the PNAE was the dependent variable. The independent variables were: PNAE management method, value of the municipality contribution, value of funds transferred by the federal government for the PNAE, and provenance of the farmers who sold food for the PNAE. Proportions and averages were used for the descriptive analysis; to analyse the correlation between variables, these were dichotomised and Fisher's exact test was used with a statistical significance level of $p \leq 0.05$.

Results

The percentage of direct procurement from FFs for the PNAE in 2012 was 67.5%. In the same year, the average funds in US dollars which the central government transferred to the municipalities was \$317,910.87, ranging from \$14,733 to \$2,103,721, while the average municipality contribution for the PNAE was \$680,746, ranging from \$0.00 to \$8,785,240. Of the 40 municipalities analysed, four did not make any contribution and six did not respond. PNAE management was centralised in 80% of municipalities; decentralised in 10%; mixed in 7.5%; and outsourced in 2.5%.

Of the 27 municipalities that had implemented direct procurement from FFs for the PNAE, 59% used FFs in the actual municipality. These comprised 44 individual farmers, 23 farming associations and 16 farming cooperatives.

Analysis of the correlation between direct procurement from FFs for the PNAE (dependent variable) and the existence of municipality contribution and centralised PNAE management method (independent variables) did not reveal any correlation when they

¹ Brazil. Presidency of the Republic. Law No. 11,947 of 16 June 2009. Articles 12 and 14.

were dichotomised, (p-value 0.63; 0.68, respectively). Similarly, no correlation was found between the remaining variables examined.

Discussion

Since the enactment of Law 11,947/2009, the PNAE has played two crucial roles: as a public policy vehicle for guaranteeing the human right to adequate food, and as a key food safety and nutrition strategy affecting both schools and family farmers. The results suggest an upward trend in the percentage of municipalities that have implemented direct procurement from FFs for the PNAE, rising from 47% (Slater et al, 2013; Saraiva et al, 2013) to 67.5%. The findings are consistent with a similar analysis of 63 municipalities in the State of São Paulo, where 76.2% bought products from FFs for the PNAE

between January 2012 and November 2013 (Bandoni et al, 2014).

It is encouraging that purchases are largely being made in the same municipality; this presupposes that there is not only a dialogue between the various players involved in the process, but the political will to implement it (Bezerra et al, 2013; De Camargo et al, 2013).

The minimum purchasing power of the municipalities that did not buy products from FFs was US\$4,419, a sum that would support at least one family farm per year. The maximum sale value by a family farm in 2012 was US\$4,404.

In conclusion, although the percentage of municipalities that have implemented local pro-

urement has increased, when it comes to the successful implementation of public policies challenges remain which go beyond economic resources. Political will, government support and the organisational efficiency of the family farmers involved may well impact on the success of local procurement, but these factors must be confirmed by more extensive studies.

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For more experiences from Latin America and the Caribbean, including detailed case studies, see FAO, 2014. School feeding and possibilities for direct purchases from family farms. Case studies from eight countries. www.fao.org/3/a-i3413e.pdf

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Relationships between wasting and stunting and their concurrent occurrence in Ghanaian pre-school children

Summary of research¹

Location: *Ghana*

What we know: Wasting is a short-term health issue, but repeated episodes may lead to stunting (long-term or chronic malnutrition). This may occur in resource-poor settings, where poor dietary intake and infectious disease are highly prevalent and persistent.

What this article adds: A reanalysis of the 2014 Ghana Demographic and Health Survey (DHS)² assessed the magnitude of and relationship between concurrent wasting and stunting among 2,720 pre-school children aged 0-59 months, along with factors associated with both conditions. Results found children who had low WHZ scores were at higher risk of stunting, especially children aged less than three years. The study confirms that wasting relates to linear growth, moderated by child age. Wasting and stunting share many common risk factors.

Background

Ghana's most recent Demographic and Health Survey (DHS) found a fall in stunting among pre-schoolers (28% in 2008 to 19% in 2014), though masking great regional disparities, with the highest prevalence of 33.1% in Northern Region. Many countries, including Ghana, have information on the prevalence and factors associated with chronic and acute undernutrition, but lack knowledge of the factors that contribute

to the development of their concurrence within the same children and the magnitude of these factors. This study investigated the relationships between wasting and stunting and associated factors in the Ghanaian population.

Methods

The study involved reanalysis of the 2014 Ghana DHS dataset of 2,720 pre-school children aged 0-59 months. The main outcome variable was the nutritional status of the child measured as

stunting (height-for-age z score (HAZ)), wasting (weight-for-age z score (WHZ)), and concurrent wasting and stunting. The independent variables were maternal weight and height, reproductive factors (parity, level of education, place of delivery, and prenatal care utilisation), child characteristics (e.g., sex and birth weight), malarial infection, child dietary intake, and household wealth index. The analyses included other household characteristics such as household wealth, region of residence, urban/rural, source of drinking water, type of toilet facilities, and educational level of the mother/caretaker. The wealth variable categorised respondents into quintiles according to the household score on the DHS wealth index, which is based on household amenities, assets and living conditions.

¹ Mahama Saaka and Sylvester Zackaria Galaa, *Relationships between Wasting and Stunting and Their Concurrent Occurrence in Ghanaian Preschool Children*, *Journal of Nutrition and Metabolism*, vol. 2016, Article ID 4654920, 11 pages, 2016. doi:10.1155/2016/4654920.

² dhsprogram.com/pubs/pdf/FR307/FR307.pdf

All data were coded for weighted analysis to take into account the complex design of multi-stage cluster surveys, and to ensure the sample data were statistically valid. Effect modification (where wasting and stunting is moderated by the age of the child) was identified and adjusted for effect through multiple regression analyses.

Results

Results showed that malnutrition prevalence among the study population was 17.9% stunting (HAZ <-2); 4.7% wasting (WHZ <-2); and 10.8% underweight (weight-for-age z score (WAZ) <-2). National prevalence of concurrent wasting and stunting was low at 1.4%, but with geographical variations. The Upper East Region had the highest prevalence of 3.2%; the lowest prevalence was in the Volta Region, with 0.5%. Further analysis of undernutrition according to age group, gender and geographical location indicate that: both wasting and stunting frequently occur as early as 0-5 months; levels of global acute malnutrition (GAM) were highest among the 6-11 months age group, and in the Upper East Region; and stunting was highest among children aged 24-35 months in the Northern Region and lowest among children aged 0-5 months.

The study confirmed that the relationship between wasting and stunting is moderated by child age; a 1-unit increase in WHZ was associated with a 0.07 standard unit increase in HAZ [$\partial=0.071$ (95% CI: 0.03, 0.15)].

Predictors of stunting and wasting

Predictors of stunting were more common than wasting, with some factors associated with both. The greatest predictors of stunting (accounting for 17.8% variability) were: low maternal height,

low birth weight (LBW), whether child is wasted or not, child age, low utilisation of antenatal care (ANC) services, poverty, and increased parity. The only amenable behavioural variable was utilisation of ANC services. Key predictors for wasting were LBW, age of child, wealth index and living in rural areas (accounting for 10% variance). Low percentage of variance accounted for in stunting and wasting suggests that there are a larger number of possible variables that were not measured in the study. Three variables – LBW, age of child and household wealth index – were found to be significant common predictors of wasting and stunting. Children whose birth weight was less than 2.5kg were about 2.0 times more likely to be wasted and 2.7 times more likely to be stunted than children with normal birth weight (>2.5kg).

Discussions and recommendations

The authors discuss and compare their findings with other research and make recommendations.

Low national prevalence of concurrent wasting and stunting (1.4%) among the Ghanaian study population may partly be due to seasonal variations in wasting prevalence, depending on when the data was collected.

WHZ relates to linear growth, but the nature and strength of the association was moderated by child age. The association was strongest among children aged 0-5 months and 12-23 months. Consistent with other studies, the study found that increasing child age is associated positively with stunting but negatively with wasting.

Cross-sectional studies at the population level have demonstrated conflicting views on the relationship between wasting and stunting in childhood. Some have found little or no as-

sociation, whereas others have found evidence that ponderal growth faltering can increase the risk of linear growth faltering. Findings in this study confirm this.

There is no clear mechanism by which wasting may lead to stunting. Some studies suggest that growth in height only takes place when the body has a minimum level of energy reserves. Body fat plays a critical role in regulating bone mass, but although fat stores are needed to promote linear growth, they are not sufficient, since stunting and overweight can co-exist in some populations (and individuals). The relationship between fat stores and stunting requires further investigation.

This study shows that predictors of stunting were more common than those for wasting, but this may be due to the lower prevalence of wasting compared to stunting in the same population, therefore statistical power to detect significant associations between wasting and other variables was low. All the risk factors for wasting were also associated with stunting, apart from rural/urban residence.

Low maternal height and household wealth index were strongly associated with child nutritional status. Household wealth index was a common predictor of both stunting and wasting, confirming that child undernutrition is strongly associated with poverty. Low maternal height (below 45cm) increased the risk of stunting but not wasting; interventions should focus equally on children and mothers to improve child health.

LBW was the most consistent risk factor for both WHZ and HAZ for all ages, which concurs with other research from birth cohorts and longitudinal studies. LBW infants should be a focus for intervention.

Local spatial clustering of stunting and wasting among children under the age of five years

Summary of research¹

Location: *Ethiopia*

What we know: The prevalence of stunting and wasting in Ethiopia has fallen but remains a considerable burden. Effective nutrition strategies must target where there is greatest burden.

What this article adds: A recent study in the Meskane Mareko District of Ethiopia used a spatial point process to investigate whether undernutrition indicators (stunting and wasting) have a tendency to cluster in order to determine the physical location and scale of clustering and discover risk factors for the observed clustering. A total 2,371 children under five years of age were anthropometrically assessed in 1,744 households. Overall stunting prevalence was 40.2% (19.1% severe); wasting prevalence was 9.8% (5.3% severe). Older children, poorest children and male children were more likely to be stunted; male children were more likely to be wasted. Only wasting and severe wasting clusters were observed in two of the six kebeles surveyed (4x and 10x more likely to be wasted/severely wasted within clusters). Across all six kebeles, likely significant clusters for stunting (1.5x risk) and severe stunting (1.7x) were identified. For stunting, household locations (elevation of the house and place of residence) were risk factors. For severe stunting, household dietary diversity, food-security status and latrine availability were risk factors. Spatial locations of high-risk areas for stunting could be an input for geographical targeting and optimising nutritional interventions.

Ethiopia has documented a significant decline in the prevalence of both stunting and underweight between 2000 and 2014; 31% decrease in stunting (58% to 40%) and 39% decrease in underweight (41% to 25%) (CSAE & ICF, 2012; CSAE & ORC, 2006; CSAE & ORC, 2001; CSAE, 2014). However, prevalence remains considerable (WHO classification: medium to high grade). Effective nutrition strategies in Ethiopia, as elsewhere, require targeting on the basis of nutritional vulnerability and burden to maximise benefit. This requires the identification of specific locations

¹ Gebreyesus SH, Mariam DH, Woldehanna T and Lindtjorn B. (2016) *Local spatial clustering of stunting and wasting among children under the age of 5 years: implications for intervention strategies*. Public Health Nutrition, 19(8), pp. 1,417–1,427. doi: 10.1017/S1368980015003377.

of at-risk populations in a given geographical area, a process that is aided by the use of spatial analytical approaches.

This paper attempts to use such an approach, spatial point process, to investigate the local spatial structure of stunting and wasting among children under the age of five years (U5s) in a particular area of Ethiopia. The study aimed to evaluate whether undernutrition indicators (stunting and wasting) have a tendency to cluster in order to determine the physical location and scale of clustering and discover risk factors for the observed clustering.

A community-based, cross-sectional study was conducted between December 2013 and April 2014 in the Meskane Mareko District of Ethiopia (around 513.65km² in size) in the Gurage Zone South of Addis Ababa. The study district houses the Butajira Rural Health Programme (BRHP) run by Addis Ababa University, a health and demographic surveillance system that collects data on vital events and demographic patterns in the district. The BRHP includes one urban and nine rural communities (kebeles) and is divided into three agro-ecological zones, each containing three kebeles. The study randomly selected two out of three kebeles from each agro-ecology zone. Data were then collected from the six kebeles, totalling 4,077 households. Out of these, 737 households were excluded (vacant or inhabitants very old and unable to respond), leaving 3,340 eligible households. From these households, weight and length/height were measured in all U5s. A team of 20 local research assistants was used to take anthropometric measurements, all of whom had initial training and evaluation of performance.

The survey collected a range of socio-demographic and health data of children and respondents; e.g. child's age, sex, morbidity, mother's education, religion, marital status and occupation, and household data; e.g. ownership and size of land, type of house and construction materials and possession of certain items. Household food security was measured using the Household Food Insecurity Access Scale (HFIAS) tool. Household food intake was qualitatively captured through 24-hour recall on food group consumption. Interviews were conducted by the 20 research assistants, overseen by two supervisors. Household geographic locations and elevations were determined using a hand-held GPS (Garmin GPSMAP®). EpiData version 3.1 was used for data entry. The statistical software package Stata version 11.0 was used for data cleaning and analysis. Anthropometric indices (Z-scores) were calculated using the WHO Anthro software version 3.2.2; analysis of spatial clustering was carried out using Kulldorf's spatial scan statistics and SaTScan™ version 9.1.

Results

A total of 3,340 households was visited, of which 53.4% (1784) households had one or more U5s. Response rate was 97.8% (1,744 households), resulting in anthropometric assessment of 2,371 U5s. Sixty-nine houses were not surveyed after repeated visits because of unavailability or refusal.



Seifu Hagos, Ethiopia

The overall prevalence of stunting among U5s was 40.2%; 19.1% were severely stunted. The highest prevalence of stunting was in children aged 24-35 months (49.9%). The lowest was in children below the age of six months (14.6%); prevalence increased with the age of child. Male children (42.9%) were more stunted than female children (37.9%) and children in the poorest wealth stratum (45.1%) were more stunted than those in the richest (35.2%). The prevalence of stunting varied considerably among the six kebeles. The highest prevalence (52%) was documented in Dobena kebele (1,853m above sea level). The prevalence of wasting and severe wasting was 9.8% and 5.3% respectively. A smaller difference in wasting prevalence was found between male children (10.7%) and female children (8.9%). The highest prevalence of wasting was documented in Shershera Bido (13.5%) and Dirama (11.7%) kebeles (≥ 1977 m above sea level). Concurrence of wasting and stunting in children was not reported.

Spatial scan statistics were applied separately for the six kebeles to find out whether there was a distinct spatial cluster in the distribution of stunting and wasting at a smaller scale. Results showed most likely significant clusters only for wasting and severe wasting in two of the six kebeles. In Dirama, a single cluster of 31 cases (18.2 expected) in 129 households was identified. Children in this cluster were four times more at risk of wasting than children outside the cluster. In Bati Lejano, a smaller cluster of seven cases (0.88 expected) in 15 households was identified; cluster children were ten times more at risk. The presence of significant clusters of undernutrition on a higher scale across the six kebeles was also examined; this indicated a most likely significant cluster for stunting and severe stunting. For stunting, a single large cluster size of 390 cases (304.19 expected) in 756 households was identified; cluster children were 1.5 times more at risk of stunting than children outside the cluster. For severe stunting, a single cluster size of 106 cases (69.39 expected) in 364 households was identified; cluster children were 1.7 times more at risk.

The authors found no difference between cases of stunting within and outside the cluster with regard to child and household dietary-related factors such as child morbidity, household dietary diversity and food-security status, nor household socio-economic conditions and latrine availability. The only factors that continued to be different were household locations (elevation of the house and place of residence). Stunted children within an identified spatial cluster were positioned at lower elevations than those outside a cluster ($P < 0.05$). For severe stunting, significant differences were found between cases within and outside the cluster with regard to household dietary diversity, food-security status and latrine availability. In these cases, no differences were found with regard to the elevation of the house and place of residence.

The authors conclude that the distribution of wasting and stunting was partly spatially structured in the communities analysed. Distinct areas were identified within and between villages that have a higher risk than the underlying at-risk population. This indicates that the spatial distribution of wasting and stunting may not be a completely random process, but could be determined beyond the individual or household level. Spatial locations of high-risk areas for stunting could therefore be an input for geographically targeting and optimising nutritional interventions.

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Carbohydrate malabsorption in acutely malnourished children and infants: A systematic review

Summary of research¹

Location: *Global*

What we know: Diarrhoea is commonly associated with SAM; carbohydrate malabsorption may be a contributing factor.

What this article adds: A recent systematic review finds a consistently reported reduced capacity for carbohydrate absorption in severely malnourished children. Evidence is lacking on the extent of malabsorption, the impact on clinical outcomes and the relationship with infections. Malabsorption of monosaccharides and disaccharides is common (most observed is lactose malabsorption); this has implications for current SAM treatment since therapeutic products tend to be high in carbohydrates. Intervention studies are needed to determine whether different therapeutic food carbohydrate profiles affect outcomes of SAM complicated by carbohydrate malabsorption, and how.

Severe acute malnutrition (SAM) accounts for approximately one million child deaths per year. SAM is associated with multiple co-morbidities that may contribute to an increased risk of death, a prominent one being diarrhoea. A common cause of diarrhoea in developing countries is enteric infection, which, when associated with underlying malnutrition, can lead to villous blunting and, as a result, impaired carbohydrate absorption. In turn, significant decreases in carbohydrate absorption can lead to severe osmotic diarrhoea. To inform future modification of therapeutic feeds, it is necessary to determine the prevalence of carbohydrate malabsorption and to understand the possible impact of carbohydrate malabsorption on the recovery of malnourished children. This systematic review aims to evaluate the research to determine the extent to which carbohydrate malabsorption occurs in children with SAM, to find out what types of carbohydrate are malabsorbed, and to find out if carbohydrate malabsorption in children with SAM is associated with osmotic diarrhoea.

A comprehensive literature search was performed in PubMed and Embase and reference lists of selected articles were further screened for additional relevant publications. All observational and controlled intervention studies involving children with SAM in which direct or indirect measures of carbohydrate absorption were analysed were eligible for inclusion. A total of 20 articles were selected for this review.

Some of the included studies performed dynamic tests of carbohydrate absorption in

children with malnutrition. The most common technique was blood glucose rise after carbohydrate tolerance tests using a glucose response curve after an oral carbohydrate load. For an oral tolerance test, generally 2g of carbohydrate per kilogram of body weight dissolved in a 10% solution was given orally after a six-hour fast and capillary blood was then sampled every 30 minutes for two hours. If the blood glucose rises less than 30mg/100ml after oral carbohydrate is administered, intolerance is considered likely; increments of less than 20mg/100ml are considered diagnostic of malabsorption. When compared with controls, children with SAM showed a decline in the average maximum glucose rise. Other studies compared malnourished children before and after treatment. One study (Viteri et al, 1973) reporting a significant improvement in carbohydrate absorption after treatment and another (James, 1972) showing no significant improvement after treatment in lactose or sucrose absorption.

Other studies, instead of comparing treated subjects with control subjects, investigated plasma glucose increments in children with SAM to indicate malabsorption after administration of a carbohydrate load. Rothman et al (1980) showed that glucose increments in eight of 12 children with SAM fell below the cut-off value of 20mg/100ml, while increments in the remaining four were less than 30mg/100ml. These findings indicate that carbohydrate malabsorption is prevalent in children with SAM. Comparison

of absorption of different types of carbohydrates was also done in several studies, which revealed that lactose intolerance is a concern for children with SAM. One study in particular looked at lactose malabsorption in different types of SAM and found that the proportion of children with lactose malabsorption was highest in those with kwashiorkor, second highest in those with marasmic kwashiorkor, and lowest in those with marasmus (James, 1972).

Some studies measured faecal pH and output of water and carbohydrate as markers of carbohydrate malabsorption. A pH of less than 5.5 (normal pH values range between 7 and 7.5) and the presence of reducing substances in the faeces are indicative of carbohydrate intolerance and malabsorption as a result of villous atrophy. A higher mean stool weight and a higher lactic acid content are also consistent with carbohydrate malabsorption. Reduced faecal pH was observed in children with SAM compared with controls in the studies that conducted carbohydrate tolerance tests, although the average pH was still more than 5.5 in all malnourished cohorts studied. Four studies demonstrated a significant reduction in mean stool weight in children on a disaccharide-free diet compared with children on a lactose-containing diet. For example, Maclean and Graham (1975) demonstrated that children with SAM on a low-lactose diet had a mean stool weight nearly three times lower than that of convalescent children. Overall, the data from faecal examination in included studies suggests the prevalence of carbohydrate malabsorption in children with SAM, as determined by increased mean stool mass, the presence of reducing substances, and an acidic faecal pH.

The other indirect method used for assessing carbohydrate absorption is the measurement of metabolic enzymes, namely lactase, sucrose and maltase in jejunal mucosal biopsy samples. Mucosal disaccharidases, specifically, are essential for disaccharide absorption. Different studies observed reduced levels of disaccharides in malnourished children. James (1972) further illustrated a rise in disaccharidase levels after treatment of both children with moderately acute malnutrition and children with SAM. In another study, two children with SAM showed normal lactase, sucrose and maltase activities; one child with SAM had low sucrose and maltase activities and borderline low lactase activity, and eight children with SAM had low lactase and sucrose activities, six of whom also has low maltase activity.

Measurement of anthropometric markers can be indirectly related to carbohydrate malabsorption and is harder to control for influencing factors. A study conducted in a cohort of 20 male children with SAM indicated that, despite the increased incidence of diarrhoea in the

¹ Kvissberg, MA; Dalvi, PS; Kerac, M; Voskuil, W; Berkley, JA; Priebe, MG; Bandsma, RH (2015) *Carbohydrate malabsorption in acutely malnourished children and infants: A systematic review. Nutrition reviews. ISSN 0029-6643 DOI: 10.1093/nutrit/nuv058*

cohort on a lactose-containing diet compared with the cohort on a lactose-free diet, both cohorts recovered well and in a similar fashion with regard to anthropometric characteristics (Prinsloo et al, 1969). In contrast, two studies showed a decreased weight gain in children on a lactose-free diet. In one study in 20 malnourished children placed on a semi-elemental diet containing glucose and maltodextrin as the carbohydrates, the average weight gain after 21 days was 420g, while in the 18 malnourished children on the cow's milk-based diet, the average weight gain after 21 days was 110g (Eichenberger et al, 1984).

This review finds a consistently reported reduced capacity for carbohydrate absorption in severely malnourished children. The extent of carbohydrate malabsorption, the impact of malabsorption on severe diarrhoea, dehydration and

other adverse clinical outcomes, and the relationship between malabsorption and infection are unclear owing to the lack of conclusive studies. Most of the observational studies reviewed by the authors suggested a prevalence of lactose malabsorption and an increase in diarrhoea and reduced weight gain in children on a lactose-containing diet. The consistent observation of malabsorption of both monosaccharides and disaccharides could have profound implications for current treatment of severe malnutrition, since the therapeutic foods in most treatment protocols have a relatively high carbohydrate content. Additional well-designed intervention studies are needed to determine whether outcomes of SAM complicated by carbohydrate malabsorption could be improved by altering the carbohydrate/lactose content of therapeutic feeds and to explain the precise mechanisms involved.

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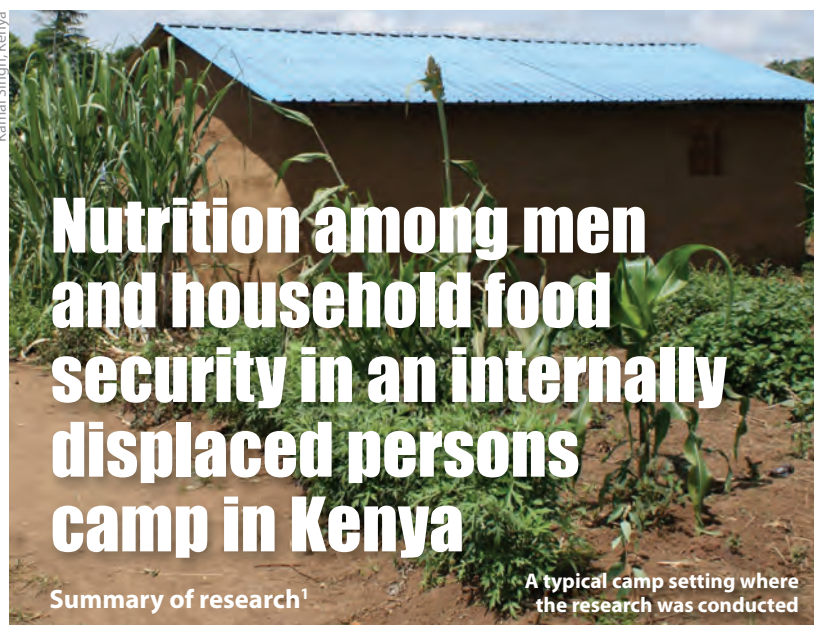
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Kamal Singh, Kenya



Nutrition among men and household food security in an internally displaced persons camp in Kenya

Summary of research¹

A typical camp setting where the research was conducted

Location: Kenya

What we know: Internally displaced persons (IDP) are vulnerable to nutrition and food insecurity.

What this article adds: A 2013 study investigated the nutritional status of 251 men and their household food-security status during a pre-harvest period in an established IDP camp in Kenya. Nutritional status was comparable to non-displaced men in Kenya (the majority (68.9%) were of normal body mass index; one quarter (23.9%) were undernourished). Household food insecurity, measured using three assessment scales, was relatively high. The most common source of food was own production (63.2%). Each had access to land; a minority depended on food aid. Recommendations to improve food security include initiatives to improve access to credit and enabling investment and capacity development in agriculture.

In 2007, disputed election results led to the outbreak of ethnic violence in Kenya, centred on the Rift Valley Province where the Kikuyu minority, among others, was targeted. Up to 600,000 people were displaced from their homes and eventually settled in Internally Displaced Persons (IDP) camps. Reports suggest that access to basic needs, including food, water, sanitation and healthcare, continues to be irregular throughout these camps. To date, no study has been published on nutrition and food security among Kenya's IDPs. The purpose of the present study was to determine the nutritional status of men and their household food-security status in an IDP camp in Kenya.

Method

The study was conducted in 2013 within an IDP resettlement camp in Rongai District, Nakuru County, for those displaced from the Rift Valley. Currently there are over 400 families residing in the study camp who have each been allocated two acres of land for agriculture and

0.25 acres of land for housing. The study was undertaken over one week in June 2013 during the pre-harvest season of high food insecurity. The study was descriptive and cross-sectional, using a questionnaire and biometric measurements. A total of 267 men aged ≥ 18 years residing within the camp were recruited via respondent-driven sampling. The questionnaire comprised 72 questions divided into three main areas: demographic characteristics, nutrition, and food security. The nutrition and food security section incorporated three assessment scales: Individual Dietary Diversity Score (IDDS) (using 24-hour recall of the consumption of different food groups); Household Food Insecurity Access Scale (HFIAS), involving recall over the previous four weeks; and Household Hunger Scale (a newly emerging measure of hunger in regions which may already be experiencing significant food insecurity, calculated using HFIAS data). The questionnaire was self-completed by participants in either English or Kiswahili with the optional use of an interpreter. Both body mass

index (BMI) and mid-upper arm circumference (MUAC) were measured.

Results

A total of 251 responses were included in the analysis. The mean age of participants was 37 years, 84.5% were of Kikuyu ethnicity and 82.1% had resided in the former Rift Valley Province prior to displacement. Three fifths of participants had completed up to or more than primary education; half were married and the mean household size was seven. Half were employed, predominantly in agriculture, and the median monthly household income was 2,500 KES (US\$32).

During the previous 12 months, most participants (95.2 %; n=239) consumed at least one

¹ Singh KP, Bhoopathy SV, Worth H, Seale H and Richmond RL (2015) Nutrition among men and household food security in an internally displaced persons camp in Kenya, *Public Health Nutrition*, 19(4), pp. 723-731. doi: 10.1017/S13689800150001275.

meal every day. The most common food source was from own production (63.7%; n=160); followed by purchase (28.3%; n=71); food from friends/relatives (4.4%; n=11); and government food aid (3.6%; n=9). The majority (86.1 %; n=216) reported poor access to household fuel.

HFAIS Scale responses revealed that the majority (80.5%; n=202) of participants had to eat a limited variety of foods and reported missing out on preferred foods (79.3%; n=199). One fifth of respondents experienced limited food variety (22.3%; n=56) or missed preferred foods (21.1% (n=53) more than ten times in the past four weeks. Half of respondents (49.0%; n=123) reported going a whole day and night without eating anything. The HFAIS score was 11.6 (potential range 0-27).

HFAIS score was associated with income. Those earning less than 2,000 KES (US\$25) per month had a significantly ($P < 0.001$) higher mean HFAIS score (14.26), suggesting greater food insecurity. The majority of participants (71.7%) were from severely food-insecure households; 13.5% were moderately food insecure; 4.8% were mildly food insecure; while only 4.8% were food secure.

The median HHS score was 2 (SD 1.5) out of a maximum possible score of 6. The most com-

mon condition of household hunger reported was going to sleep hungry at least once in the previous four weeks (62.5 %; n=157). The condition experienced most was having no food of any kind in the household: 7.2% (n=18) experienced this more than ten times. The majority of participants were from households with moderate hunger (46.6%), followed by little or no hunger (40.2%) and severe hunger (10.0%). Men aged over 45 years and from households earning less than 2,000 KES (US\$25) per month were more likely to report being in the severe household hunger category.

IDDS results show that starchy staples (e.g. thick maize porridge (ugali) and thin maize porridge (uji) were eaten by 92% of participants. Organ meat (e.g. liver, heart and kidney) was the least common (21.9%). The mean IDDS was 6 out of a possible 9 (SD 1.8). Low dietary diversity (score ≤ 4) was associated with income, food insecurity and household hunger.

The mean BMI of respondents was 20.3 (SD 2.5). The majority (68.9 %) had a normal BMI. One quarter (23.9%; n=60) were underweight, of whom 85% had mild thinness (BMI=17.0-18.4); 13.3% had moderate thinness (BMI=16.0-16.9); and a single participant had severe thinness (BMI ≤ 15.9). Being underweight was associated

with being older, having less income and being married or living with a partner. The mean MUAC was 26.4cm (20.5-36.5).

Anthropometry was similar to other studies among non-displaced men in rural Kenya, which contrasts with other findings, suggesting IDPs have poorer nutritional status than comparable non-displaced populations. This may be due to the study being undertaken in a relatively stable and well-developed camp, five years post-displacement, among households with access to agricultural land and low reliance on food aid. However, levels of food insecurity among camp households are worse than those in average rural settings in the region. This may in part be due to the lack of household capital to support agriculture; community conversations suggest lack of income means that fertiliser, agricultural implements and seeds are difficult to access.

Recommendations: Recommendations to improve food security include registering land allocations under the name of the owner to provide access to credit and encourage investment in agricultural implements, as well as agricultural education programmes. Such steps will be essential to address severe food insecurity and minimise its impact on mental health, disease profiles and family wellbeing documented in other IDP settings.

How to engage across sectors: Lessons from agriculture and nutrition in the Brazilian School Feeding Programme

Summary of research¹

Location: *Brazil*

What we know: Historically, successful collaboration between agriculture, nutrition and health sectors has proved challenging.

What this article adds: A recent study identified five key lessons for promoting inter-sectorality for nutrition, based on the Brazilian experience of linking family farming with the National School Feeding Programme. The lessons were: identifying a common political, philosophical or governance space to enable sectors to convene; form coalitions with more powerful sectors with a shared (non-nutrition) goal which can help deliver on nutrition objectives; position nutrition and health goals as solutions (not problems) to the interests of other sectors; obtain evidence of successful inter-sectoral work; be bold in ideas for cross-sectoral work.

Brazil's National School Feeding Programme, Programa Nacional de Alimentação Escolar (PNAE), is a universal and free programme that began in 1954 and that currently serves 45.6 million public school students. In June 2009, a law was signed in Brazil requiring that 30% of the food budget of the national school feeding programme should be used to purchase foods directly from family

farms. This study examines integrating family farming and nutrition into a legal framework in Brazil to identify lessons on how to successfully shift other sectors toward nutrition goals.

Information and perspectives on the development of Article 14 were obtained from interviews with 18 leading actors involved, during February and July 2010. Questions explored

the nature of the inter-sectoral approach, interests and values involved, and factors both facilitating and presenting barriers to the approval of Article 14. Documentation on the history of the development of the law and key

¹ Hawkes C, Brazil GB, Castro IR, Jaime PC (2016). *How to engage across sectors: lessons from agriculture and nutrition in the Brazilian School Feeding Program*. Rev Saude Publica. 2016 Aug 11;50:47. doi: 10.1590/S1518-8787.2016050006506.

antecedent actions from published documents was also examined.

The study provided five key lessons for promoting inter-sectorality for nutrition, based on the Brazilian experience of linking family farming with the National School Feeding Programme, as follows:

Lesson One: Identify or create a triage of spaces to bring together different sectors – political, philosophical, and governance spaces

In 2003, food security moved to the centre of the political stage with the development of a new programme, Fome Zero. This emphasised the need for structural reform to address income poverty and encourage the production of lower-cost food, including by supporting family farmers. A large, cross-sectoral government civil society group, CONSEA, was established to advise the President on policies and actions needed to promote food and nutrition security. The new Government also created the Programa de Aquisição de Alimentos (PAA – Food Acquisition Programme), which purchases food directly from family farms and distributes it to institutions and families at risk of food and nutritional insecurity by social programmes.

The addition of nutrition into the concept of food security was forged during this process and formally approved at the second Conferência Nacional de Segurança Alimentar e Nutricional (CNSAN – National Conference on Food and Nutrition Security) in 2004. According to this broader concept, as a way of ensuring the human right to adequate food, public policies on food and nutrition security should not only encompass actions to improve availability of and access to food, but also promote and protect sustainable and healthy diets. This concept links the nutritional dimension of food security that puts all sectors and their priorities and agendas in the same space.

Crucial to this was an inter-sectoral framework of food and nutrition security that provided the philosophical space to put the two problems of food security and nutrition together, the policy space provided by the new Government for this joint issue, and the governance provided by CONSEA to make it happen.

Lesson Two: Forming coalitions with more powerful sectors focused on achieving a common political goal that can help move them toward nutrition and health goals

Successful lobbying for Article 14 was strengthened by three overlapping advocacy coalitions. The first was between the relevant government min-

istries and agencies who had first discussed family farming-PNAE links. The second coalition consisted of food security advocates, Frente Parlamentar de Segurança Alimentar e Nutricional (Parliamentary Front on Food and Nutrition Security), comprising over 230 deputies and senators in 2007, led by an influential politician who partnered with civil society. The third coalition was a group of family farming advocates, which provided strong mobilisation and extensive, well-organised advocacy activities.

Improving nutritional outcomes was not the primary goal of Article 14. The stated aim was



WFP/Isadora Ferreira

These experiences suggest that the political process of identifying and participating in a strong coalition that is able to cause change in the right direction, and that is focused on fighting for a common goal into which nutrition and health can fit, is more important than an explicit nutrition goal, which is often called for by the international nutrition community in nutrition-focused development (UNSCN, 2015).

Lesson Three: Positioning nutrition and health goals as a solution that meets the interests of other sectors

Article 14 explicitly met the interests of family farmers through new markets and income generation, which secured the backing of family farming interests. Thus the incentive for inter-sectorality came from a solution, rather than a problem. Article 14 met the interests of a more powerful sector, family farmers, and nutrition and health goals were met as a by-product.

Lesson Four: Obtaining evidence that the inter-sectoral approach can work

Article 14 was not the first initiative in Brazil linking family farmers with markets. Most notable was the Food Acquisition Programme (PAA) established in 2003. This group had a crucial role in the approval of Article 14 by providing evidence that family farming works; specifically and notably that the pricing and procurement mechanism could work and family farmers could supply sufficient food.

Lesson Five: Not being afraid of bold ideas when working with other sectors

Article 14 was a bold and appealing idea. It not only had the political appeal of supporting family farmers and economic development, but “it was an important political force in the minds of the population, the social imagination and the enhancement of self-esteem of the farmers

because it will nourish the children”. Principles, language, assumptions and approaches change when working with other sectors: they can be exploited for mutual advantage.

This study on policy processes shows how a convergence of factors enabled a link between family farming and school feeding in Brazil. It highlights key strategies in engaging other sectors on working towards nutrition goals to benefit all sectors involved.

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to support local economic development, not to improve nutrition. Nutrition interests were represented within the various groups, but not central to discussions, and the process lacked a clearly distinguishable coalition formed around nutrition and health interests. Nutritionists did advocate to ensure that, by law, a nutritionist should design the menus for the PNAE and to include specific nutritional standards for school meals within the final Bill. The authors argue that politically it served the nutrition interest not to focus on the nutrition technicalities but on a common goal: to change the PNAE. Engagement of nutritionists with a clear nutrition objective was important; however not focusing on that goal as the foundation of the coalition was politically advantageous.

An investment framework for nutrition: Reaching the global targets for stunting, anaemia, breastfeeding and wasting

Summary of research¹

Location: *Global*

What we know: Child malnutrition has lifelong consequences for health, human capital, economic development, prosperity and equity. Global nutrition targets (2012) focus on stunting, anaemia, low birthweight, childhood overweight, breastfeeding and wasting; the cost of achieving this is unknown.

What this article adds: A recent comprehensive analysis by the World Bank estimates an additional investment of \$70 billion (£62 billion approx) over ten years is needed to achieve global targets for stunting, anaemia in women, exclusive breastfeeding and scaled-up treatment of severe wasting. This would avert 3.7 million child deaths; every dollar invested would yield between \$4 and \$35 in economic returns. Investment in a subset of priority interventions would cost \$23 billion (£19 billion approx); global targets would not be reached, but 2.2 million lives would be saved. Achieving global goals is feasible but concerted efforts in financing, scale-up and sustained commitment are needed. Research priorities include scalable strategies for delivering high-impact interventions, how to improve the technical efficiency of nutrition spending, and costs and impacts of nutrition-sensitive interventions.

In 2015, 159 million children under the age of five were chronically malnourished or stunted, underscoring a massive global health and economic development challenge (UNICEF, WHO, and World Bank 2015). In 2012, in an effort to rally the international

community around improving nutrition, the 176 members of the World Health Assembly endorsed the first-ever global nutrition targets, focusing on six areas: stunting, anaemia, low birthweight, childhood overweight, breastfeeding and wasting. Some of the targets (stunting and

wasting) are further enshrined within the United Nations Sustainable Development Goal 2 (SDG 2), which commits to ending malnutrition in all its forms by 2030.

Nutrition targets: Investment case and constraints

Ending malnutrition is critical for economic and human development. Childhood stunting has lifelong consequences not just for health, but also for human capital and economic development, prosperity and equity. Reductions in stunting may increase overall economic productivity. Nutrition interventions are consistently identified as one of the most cost-effective development actions. However, although the investment case for nutrition is strong, factors limiting achievement of nutrition SDG targets include insufficient financing, complexity of implementation, difficulty determining the methods and costs involved in monitoring SDG targets, and the resources required for scale-up. There is little evidence on the estimated costs of achieving the global nutrition targets, including the SDG targets. No previous study has systematically linked the costs with the potential for impact and the interventions' returns on investment, nor assessed the financing shortfall between what is required and global spend. Finally, no prior study has presented a comprehensive global analysis of domestic financing from governments and official development assistance.

This report aims to close these knowledge gaps by providing a more comprehensive estimate of costs as well as financing needs, linking them both to expected impacts, and laying out a potential financing framework. An in-depth understanding of current nutrition investments, future needs and their impacts, and ways to mobilise the required funds, are included.

Estimated financing needs

An additional investment of \$70 billion (£62

Figure 1 2025 target



¹ Shekar, Meera; Kakietek, Jakub Jan; Dayton, Julia M.; Walters, Dylan David. 2016. *An investment framework for nutrition: reaching the global targets for stunting, anemia, breastfeeding and wasting: executive summary*. Washington, D.C.: World Bank Group. documents.worldbank.org/curated/en/847811475174059972/executive-summary

billion approx) over ten years is needed to achieve the global targets for stunting, anaemia in women, exclusive breastfeeding and scaled-up treatment of severe wasting. The expected impact of this increased investment is the prevention of 65 million cases of stunting and 265 million cases of anaemia in women in 2025, as compared with the 2015 baseline. In addition, at least 91 million more children under five years of age would be treated for severe wasting and 105 million additional babies would be exclusively breastfed during the first six months of life over 10 years. Such investment would also result in at least 3.7 million child deaths being averted. Every dollar invested in this package of interventions would yield between \$4 and \$35 in economic returns.

In an environment of constrained resources, prioritisation of a subset of interventions is necessary – scaling-up of interventions with the highest returns, that are scalable now, with the strong caveat that global targets would not be reached. Costing \$23 billion (£19 billion approx) over next 10 years, when combined with other health and poverty reduction efforts, an estimated 2.2 million lives would be saved and there would be 50 million fewer cases of stunting in 2025 than in 2015.

A mix of domestic on-budget allocations from national governments, overseas development aid (ODA), newly emerging innovative financing mechanisms and household contributions could finance the remaining gap. A society-wide effort is needed for financing the achievement of the nutrition targets; this mix of financing is also in line with other SDG challenges. Not only do investments in nutrition make one of the best

value-for-money development actions, they also lay the groundwork for the success of investments in other sectors.

Recent country experiences suggest that meeting global nutrition targets are feasible, although some, especially those for reducing stunting in children and anaemia in women, are ambitious and will require concerted efforts in financing, scale-up and sustained commitment. On the other hand, the target for exclusive breastfeeding has scope to be much more ambitious.

Priority research areas include:

Research on scalable strategies for delivering high-impact interventions, including how to address bottlenecks to scaling-up.

The assessment of allocative efficiency, i.e. identifying the optimum funding allocation among different interventions or an allocation that maximises the impact under a specific budget constraint.

Research to improve the technical efficiency of nutrition spending, including identifying new strategies for addressing complex nutritional problems such as stunting and anaemia, as well as technologies to help take these solutions to scale more rapidly and at lower cost.

Strengthening the quality of surveillance data, unit cost data for interventions in different country contexts, and building stronger data collection systems for estimating current investments in nutrition (from both domestic governments and ODA). Further research is needed on the costs of interventions and significant resources will be required to build a living database of current investments, including closely monitoring spend-

ing and ensuring accountability, and to undertake national-level public expenditure reviews.

Research on which interventions prevent wasting is urgently needed. It is also essential to learn more about cost-effective strategies for managing moderate acute malnutrition, and whether or not these can contribute toward the prevention of wasting.

Costs and impacts of nutrition-sensitive interventions; i.e. interventions that improve nutrition through agriculture, social protection and water and sanitation sectors, among others. It is evident that stunting and anaemia have multiple causes and can be improved through increasing quality, diversity and affordability of foods; increasing the control of income by women farmers; and reducing exposure to faecal pathogens by improved water, sanitation, and hygiene practices. However, the attributable fraction of the burden that can be addressed by these interventions is unknown.

The authors end with a call to action. Investments in the critical 1,000-day window of early childhood will pay lifelong dividends, not only for the children directly affected but also for us all in the form of more robust societies that will drive future economies.

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Advancing Early Childhood Development: From Science to Scale

Location: *Global*

What we know: There have been major improvements in child survival over the last 30 years. A major focus of the 2030 Sustainable Development Goals (SDGs) is now on early childhood development (ECD) to ensure that every child can achieve their full human potential.

What this article adds: The 2016 Lancet Series Advancing Early Childhood Development: From Science to Scale, has just been released. It estimates that 250 million (43%) of children under five years of age in low- and middle-income countries (LMICs) are at risk of poor development outcomes. Risks to health and wellbeing go beyond stunting and extreme poverty to include factors such as low maternal education and physical maltreatment. This Series highlights emerging scientific evidence and proposes pathways for implementation of ECD programmes at scale. 'Nurturing care' is emphasised, especially of children below three years of age, and multi-sector interventions starting with health.

Introduction

The 2016 Lancet Series Advancing Early Childhood Development: From Science to Scale has just been released, comprised of six comments and five papers. Building on the findings and recommendations of the previous Lancet Series, this highlights new scientific evidence for interventions and recommends pathways for scaling up ECD programmes.

Focus of the 2030 Sustainable Development Goals (SDGs) is on early childhood development (ECD) to ensure that every child can achieve their full human potential. The first three years of life offer a window to amplify ECD interventions if stimulation through parenting, educational support and adequate health and nutrition are provided. Despite the decrease in child mortality over the past 30 years, the extremely high burden of risk for poor developmental outcomes remains, affecting an estimated 250 million (43%) of children under five years of age in low- and middle-income countries (LMICs). Sub-Saharan Africa's burden is even greater, with two thirds of children affected. The burden of poor child development has been underestimated because risks to health and wellbeing go beyond stunting and extreme poverty to include factors such as low

maternal education and physical maltreatment. Multi-sector policies and funding for ECD have increased, but few countries have institutionalised the implementation of these policies. Services for ECD remain fragmented and programmes at scale are rare and poorly evaluated.

This Series provides compelling new evidence in two areas. First, new research on early human development shows that adaptations (e.g. epigenetic and psychological) to the environment begin at conception and affect development throughout life, with implications for targeted interventions. Second, evidence is presented on long-term outcomes in LMICs. For example, a programme to increase cognitive development in stunted children in Jamaica 25 years ago resulted in a 25% increase in average adult earnings.

Key messages from the Series
The burden and cost of inaction is high

A poor start in life limits children's abilities to benefit from education, resulting in lower productivity and social tensions. Consequences are inter-generational: poor ECD leads to a cycle of lost human capital and perpetuation of poverty for both the individual and future generations. Predicted losses are 25% average adult income per year; nationally, this could amount to twice current GDP spend on health.

Early means early

Child development starts at conception and depends on good nutrition and certain types of

experience. A young child's developing brain is patterned by the 'nurturing care' of adults, including age-appropriate learning experiences. Many families cannot provide these due to stresses and conditions that affect their ability to parent, including extreme poverty and family and societal conflict. Families need support to provide nurturing care; e.g. material and financial resources, knowledge, time and skilled assistance. Support should be provided through policies such as paid parental leave, time at work for breastfeeding and the provision of free pre-primary education.

A start can be made through health

The health sector has unique advantages, since it has existing maternal and child health services that can be expanded to feasibly and affordably include evidence-based nurturing care interventions; most important are those strengthening the growth and health of mothers and young children. Other essential services are child protection for violence prevention, social protection for financial stability, and education for quality early-learning opportunities.

Scale up what we know works

Small-scale civil society initiatives can be scaled up to effective and sustainable national programmes. Government leadership and political prioritisation are prerequisites, but different pathways may be followed to achieve ECD targets, from staged enhancement of existing strategies to transformative, whole-government initiatives.

Overview of papers

Objectives of the first paper (Black et al, 2016) are to update the estimates of children at risk of not attaining their developmental potential and to present a life-course, conceptual ECD framework. The paper also examines current access to, and describes opportunities to implement, centre-based and home-based cross-sector ECD programmes.

The second paper (Britto et al, 2016) provides a comprehensive, updated analysis of ECD interventions across the five sectors of health, nutrition, education, child protection and social protection.

The third paper (Richter et al, 2016) presents new analyses showing that the burden of poor development is higher than estimated, taking into account additional risk factors. National programmes are needed with greater political prioritisation key to scale-up of available effective programmes to support ECD. All sectors, particularly health, education and social and child protection, must play a role to meet the holistic needs of young children.

The fourth paper (Shawar & Shiffman, 2016) describes multiple opportunities to advance political priority for ECD, including an increasingly favourable political environment, advances in ECD metrics, and the existence of compelling arguments for investment in ECD. However, proponents will need to overcome the framing and governance challenges to leverage these opportunities.

The fifth and final paper (Chunling et al, 2016) updates the 2004 estimates (published in 2007) of children exposed to stunting or extreme poverty with the use of improved data and methods and generated estimates for 2010. The 2007 study underestimated the number of children at risk of poor development. Progress has been made in reducing the number of children exposed to stunting or poverty, but it has been insufficient: targeted interventions are urgently needed.

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Role of nutrition in integrated early child development

Summary of research¹

Introduction

Child development has multiple dimensions, including physical, sensorimotor, social, emotional, language and cognitive. Children develop rapidly during the first five years of life from being unable to speak and walk to having fairly advanced motor, social and cognitive skills. The importance of the first 1,000 days (from gestation to two years) in helping a child develop healthy growth is well established. The brain grows very rapidly during the same period; between three and five years of age its development continues with new abilities building on those already acquired.

Early child development (ECD) is recognised as one of the most important predictors of future social capital and national productivity, yet the recent ECD Lancet Series reports that about 250 million children under five years old are at risk of not reaching their developmental potential (see summary in this edition of *Field Exchange*). This special issue of *Maternal and Child Nutrition* brings together important, previously published articles on ECD (with priority given to the last two years) to identify how the nutrition sector can contribute to ECD in the context of multi-sector interventions. This is crucial given the centrality of ECD indicators as part of the 2030 Sustainable Development Goals (SDGs).

The 14 papers in the series are identified under four headings:

Nutrition and child development across the life-course

Auduchon-Endsley et al (2016) found that excessive maternal weight and gestational weight gain was associated with poorer neurobehaviour in infants via hormonal pathways, highlighting the importance of peri-conceptual nutrition.

The positive association between breastfeeding and academic ability at 12 years of age was found to be independent of socioeconomic status and parenting behaviours, according to a prospective study by *Huang, Vaughn and Kremer (2016)*.

Crookston et al (2011) found concurrent stunting (stunted at 4.5-6 years of age) to have a greater impact on cognitive skills than early stunting (6-18 months of age) in Peruvian children participating in the Young Lives study. Another cohort study in Malawi found that improved height gain between two and 15 years of age, but not between birth and two

Location: *Global*

What we know: Early child development (ECD) is a key predictor of future social capital and national productivity. Worldwide, 250 million children under five years old may fail to reach their developmental potential due to extreme poverty and social injustice.

What this article adds: A special issue of *Maternal and Child Nutrition* that compiled previously published articles on ECD related to nutrition shows that nutrition-specific interventions, though essential, are not sufficient for children to reach their full developmental potential. Non-nutrition factors such as social determinants of health, parenting style and early childhood stimulation affect other ECD dimensions (psychosocial, cognitive and educational); poverty and social exclusion limit access. Multi-sector programmes are needed at scale that consider responsive parenting, learning stimulation, education and social protection, in addition to health and nutrition.

years of age, was independently associated with cognitive development (*Teivaanmäki et al, 2016*), strongly suggesting the importance of promoting linear growth post-1,000 days for long-term cognitive development.

Liu and Raine (2016) found that malnourished children in a large sample of three-year-olds in Mauritius had impaired social functioning, with a dose-response relationship; i.e. increased malnutrition was associated with more impaired social behaviour.

Findings from studies investigating the association between micronutrients and ECD remain inconclusive. *Makrides et al (2011)* confirmed that the effect of maternal fatty acid supplementation on global neurobehavioural outcomes for children remains unclear, although fatty acid supplementation of women expressing milk for their pre-term infants appears to improve infant neurodevelopmental performance.

Social and behavioral mediators

Mallan et al (2015) found that maternal postpartum depression, assessed at four months postpartum, had a negative association with the mother's ability to feed her two-year-old children responsively (i.e. pressure to eat, restrictive feeding style and emotional feeding). Such practices may undermine child self-regulation of intake, which is associated with increased risk of overweight.

Interventions

A meta-analysis by *Larson and Yousafzai (2015)* concludes that the mental development of children under two years in low and middle-income countries (LMICs) is more strongly influenced by their motor development than their growth status resulting from postnatal nutrition interventions. This important finding underscores the need to integrate child psychosocial stimulation with nutrition as part of ECD interventions.

The Baby-Friendly Hospital Initiative (BFHI) Ten Steps were found to have a positive impact on short, medium and long-term breastfeeding outcomes, with a dose-response relationship between the number of BFHI steps women are exposed to and breastfeeding outcomes (*Pérez-Escamilla et al, 2016*). Such findings have major implications for ECD, since strong and consistent evidence supports the impact of breastfeeding on a child's intellectual development, an effect which carries on into adulthood (*Victoria et al, 2016*).

A randomised controlled trial in India (*Vazir et al, 2013*) found that responsive feeding education of caregivers improved dietary intake, growth and mental development among toddlers, underlining the need for integration of parenting skills as part of nutrition interventions targeting young children.

Fabrizio et al (2014) identified key components of effective behaviour-change interventions to improve complementary feeding practices as identifying barriers and enablers and delineating programme-impact pathways, pointing to the need for inter-disciplinary partnership in maternal-child nutrition.

In a review of water, sanitation and hygiene (WASH) interventions, *Cumming and Cairncross (2016)* add to the strong evidence that malnutrition and infectious diseases are interrelated and that WASH should be part of multi-focal ECD interventions.

Policy

Subramanian et al (2016) call for a rethinking of policies to address child stunting in South Asia, the region most affected, and conclude that upstream social determinants of health must be urgently addressed to tackle the problem.

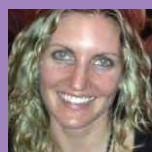
Conclusions

This collection of papers shows that nutrition-specific interventions, though essential for child development, are not sufficient for children to reach their full developmental potential. This is due to the many non-nutrition factors, such as social determinants of health, parenting style and early childhood stimulation that affect other ECD dimensions (psychosocial, cognitive and educational). Poverty and social exclusion limit the access of families to most, if not all, of these factors. Multi-sector programmes need to consider including responsive parenting (including responsive feeding), learning stimulation, education and social protection, in addition to health and nutrition. Programme scale-up by governments to address multiple factors in an integrated way is crucial. Research is needed to better understand if and how childhood obesity affects the different dimensions of ECD.

All references and papers are free to access online at [onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1740-8709/homepage/virtual_issue_integrated_early_child_development](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1740-8709/homepage/virtual_issue_integrated_early_child_development)

Combined protocol for SAM/MAM treatment: The ComPAS study

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A more detailed version of this article will be prepared for publication in a peer-reviewed journal.

Location: Chad, Kenya, Yemen, Pakistan, South Sudan.

What we know: Different protocols, products and service systems are used to treat severe and moderate acute malnutrition, which complicates management of the conditions.

What this article adds: Stage 1 of the three-year Combined Protocol for Acute Malnutrition Study (ComPAS) retrospectively analysed treatment data (growth, energy requirements) from acutely malnourished children to develop (by expert committee) a simplified MUAC-based dosing chart to treat both SAM and MAM (Combined Protocol). The study found that growth trends in MUAC mirror those of proportional weight gain during treatment. Rates of gain in MUAC and weight slow with increasing MUAC and as they do, proportional energy needs decrease. Total energy needs of 95% of all children with a MUAC <125mm can be met with 1,000 kcals/day. Given this, a Combined Protocol is proposed that admits children with MUAC <125mm and/or oedema and treats as follows: MUAC <115mm - 2 sachets RUTF/d; MUAC 115mm- <125mm -1 sachet RUTF/d). The next phase of ComPAS aims to examine the effectiveness and cost-effectiveness of this simplified protocol.

The Combined Protocol for Acute Malnutrition Study (ComPAS) aims to simplify and unify the treatment of uncomplicated severe and moderate acute malnutrition (SAM/MAM) for children aged 6-59 months into one protocol in order to improve the global coverage, quality, continuity of care and cost-effectiveness of acute malnutrition treatment in resource-constrained settings. Building on a number of studies (see Box 1), the Combined Protocol proposes to use only one product (ready-to-use therapeutic food (RUTF)), at doses tested to optimise growth and minimise cost at each stage of treatment. Admission, progress and discharge will be assessed using mid upper arm circumference (MUAC) and oedema only. It is hypothesized that this approach will eliminate the need for separate products/infrastructure/administrative procedures for MAM treatment; enable earlier treatment of cases before deterioration into more costly SAM treatment; enable better continuity of care; and lead to more positive community perceptions of the programme.

ComPAS began in October 2014 and completed its first stage of secondary data analysis in January 2016. The second stage will consist of a multi-country cluster randomised trial in two countries and is expected to be completed by December 31, 2017. It is guided by a scientific committee of global experts in paediatrics and nutrition and comprised of partnerships between the International Rescue Committee (IRC), Action Against Hunger-USA (AAH-USA), Action Against Hunger-UK (AAH-UK) and the London School of Hygiene and Tropical Medicine

Box 1 What is known? Research underpinning ComPAS

The current SAM treatment protocol bases RUTF dosage on 175–200 kcal/kg/day until children are discharged as cured. However, research indicates food intake drops (Ashworth, 1969) and growth rate (weight and MUAC-based) slows (Goossens et al, 2012) towards the end of treatment. Similar cured/death/defaulted results have been found where RUTF dosage was reduced at the end of SAM treatment (Cosgrove et al, 2012); this observation is being further explored through ACF research. A recent trial in Sierra Leone suggests that an integrated SAM/MAM programme using RUTF had more favourable outcomes on coverage and is an acceptable alternative to standard treatment (Maust et al, 2015).

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Stage 1 of ComPAS retrospectively analysed treatment data from acutely malnourished children aged 6–59 months to assess growth trends and energy requirements and develop a simplified dosing chart based on MUAC. Preliminary findings are summarised in this article; a more detailed final analysis is planned for future peer-reviewed publication. Further initial findings, Figures 1–4 and Table 3 are available online at:

<http://www.ennonline.net/fex/53/thecompasstudy>

Objectives

The objectives of Stage 1 of ComPAS were to:

- 1) Assess rate of growth and
 - a. Calculate energy requirements for observed growth in children recuperating in Outpatient Therapeutic Programmes (OTPs) and Supplementary Feeding Programmes (SFPs);
 - b. Evaluate differences in the response to treatment according to geography, age, anthropometric status on admission, and treatment outcome;
- 2) Calculate energy requirements by MUAC category; and
- 3) Propose a physiologically appropriate dosage table based on MUAC that could be used in a simplified and unified protocol.

Method

A secondary analysis of data from children recovering from SAM in OTP and from MAM in SFP programmes was used to evaluate growth trends in response to treatment, using registration book/patient card data from the following programmes and countries:

- International Rescue Committee (IRC): Chad, Kenya, Yemen.
- Action Against Hunger-USA (AAH-USA): Pakistan.
- Médecins Sans Frontières-France (MSF-France): South Sudan.

Data from 10,070 acutely malnourished children between the ages of 6 and 59 months were available (see Table 1); 8,233 were retained for analysis (Table 2). Most patients from each country were

retained in the analysis, ranging from 75% in Kenya to 90% in Chad. Reasons for exclusion included uninterpretable or unfeasible data that limited interpretation of individual course of recovery.

To balance the contributions of each of the five countries in the analysis when using local polynomial estimation (described below), 1,300 visits were randomly selected from each country for a total of 6,500 visits (from, at most, 2,798 children) in a sub-sample used for the visual analysis of growth. This visual analysis of the local polynomial estimation of growth by MUAC at last visit guided the decision to assess energy needs over ranges of MUACs at last visit in meaningful but theoretical groups.

Method for objective 1: Assess rate of MUAC and proportional weight gain and energy requirements of children and evaluate differences in the response to treatment

Using local polynomial smoothing, we visually assessed the relationship between:

- (1) One-week MUAC growth (mm); and
- (2) Proportional weight gain (g/kg/day) compared to last-measured MUAC among children discharged as “recovered”.

One-week MUAC growth was calculated as the difference between two MUAC measurements when a child's visits are one week apart. When a child's visits were recorded as being two weeks apart, the difference between the first and second visit MUAC is divided by two to estimate weekly MUAC growth. Proportional weight gain was calculated as the weight gain (in grams) divided by weight at last visit (in kg) divided by number of days since the last visit prior to the reference visit (hereafter simply referred to as the “last visit”).

This analysis was performed for all data together (unweighted), by region (Africa and Asia), by country, and by age group. Except when compared by country, reported values and figures reflect results from the n=6,500 sub-sample described above.

Method for objective 2: Calculate energy requirements by MUAC category

Daily energy needs were estimated as:

Current weight (in kg) * resting energy needs (82 kcal/kg) + weight gain (in grams) * energy costs of weight gain (5 kcal/g) (FAO, 2001)

Changes in energy needs were calculated for each child as kcal/day as per the above formula and as kcal/kg weight. Both values are reported by MUAC at last visit. As an example, consider a child who weighed 7.1 kg, had a MUAC of 116mm on their 5th visit to the clinic, and weighed 7.4 kg on their 6th visit 7 days later. This means that the child gained, on average, 42.9 g in weight per day between visits. To estimate the child's daily energy needs to achieve that growth, we calculate:

$7.1 \text{ kg} * 82 \text{ kcal/kg} + 42.9 \text{ g} * 5 \text{ kcal/g} = 796 \text{ kcal}$. Because the child's MUAC was 116mm at their 5th visit, this energy need estimate is reported along with other children's calculated energy needs who had a MUAC of 116mm at their prior visit.

Method for objective 3: MUAC dosage table

An expert scientific committee reviewed the results of objectives 1 and 2 and proposed a MUAC/RUTF dosage table that would cover the total energy needs of >95% of children aged 6–59 months with a MUAC <115mm, and half the energy needs of >95% of children aged 6–59 months with a MUAC 115–<125mm.

Results**Growth trends in MUAC mirror those of proportional weight gain and rates of MUAC and weight gain slow with increasing MUAC**

Amongst children with similar MUACs at a given visit, MUAC and proportional weight gain show roughly the same growth trend. Proportional rate of growth tends to be lower for children with higher MUACs, and rates of growth appear to plateau over ranges of MUACs (see Figure 1 online).

Table 1 Summary of data provided by three agencies from five countries

Country (organization)	Source	Total patient count	Admitted to OTP facility	Admitted to SFP facility	Admitted with SAM MUAC or WHZ*	Admitted with MAM MUAC or WHZ**
Yemen (IRC)	Patient registers	1,099	315	784	317	782
Kenya (IRC)	Patient cards	1,685	421	1,260	527	1,158
Chad (IRC)	Patient cards	2,054	639	1,415	529	1,525
Pakistan (ACF-USA)	Patient cards	2,619	551	2,068	661	1,958
South Sudan (MSF-France)	Patient database	2,613	2,613	0	2,407	162
TOTALS		10,070	4,539	5,527	4,441	5,585

* SAM defined as MUAC < 115mm and/or WHZ < -3z

** MAM defined as MUAC 115–< 124mm and/or WHZ-3- < -2z

Table 2 Counts of patients excluded from the analysis by country

	Kenya	Pakistan	Chad	Yemen	South Sudan	Total
Patient retained in analysis	1,259	2,260	1,849	853	2,012	8,233
	75%	86%	90%	78%	77%	82%
Patient removed from analysis	426	359	205	246	601	1,837
	25%	14%	10%	22%	23%	18%
TOTALS	1,685	2,619	2,054	1,099	2,613	10,070

Note on Table 2: Most patient from each country were retained in the analysis, ranging from 75% in Kenya to 90% in Chad. Reasons for exclusion included uninterpretable or unfeasible data that limited our ability to interpret a patient's course of recovery

No significant difference was observed in growth trends across MUAC at last visit by age group (under two years and over two years) or by stunting status (greater/equal to or less than height for age (HAZ) <-2 z-scores).

When comparing children enrolled in programmes in the three African countries (South Sudan, Chad and Kenya) and children enrolled in programmes in the two Asian countries (Yemen and Pakistan), a notable difference in weekly MUAC gain is observed between 111mm and 123mm MUAC at last visit (1.4 mm vs 0.7 mm). New plateaus in MUAC gain might be seen at 115mm and 126mm among children in Africa, whereas only one new plateau appears to form among children in Asia over MUAC at last visit, starting at around a MUAC of 110mm (see Figure 2 online).

As the rates of MUAC and weight gain slow, proportional energy needs decrease

Comparisons of MUAC and proportional weight gain to MUAC at last visit indicate that average proportional energy needs (that is, energy needed per kg of weight to achieve observed growth) follow a similar step-down pattern (see Figure 3 online), although total energy needs increase due to greater total body weight. Among children with MUAC <125mm, the children with the greatest energy needs to achieve observed growth are those with the lowest MUACs; approximately 150-160 kcal/kg/day would be enough to support the growth observed in 95% of visits among children with the lowest MUAC. In these data, energy needs never exceed 190 kcal/kg/day (see Figure 3 online).

Total energy needs of 95% of all children with a MUAC <125mm can be met with 1,000 kilocalories a day

The 95th percentile line indicates the number of kilocalories that would be sufficient to cover the total energy needs of 95% of children with 100mm ≤ MUAC < 115mm, 115mm ≤ MUAC < 125mm, or 125mm ≤ MUAC ≤ 140mm. Minor differences were observed between estimated energy needs for children in Africa and Asia when MUAC was below 115mm (909 kcal in Africa vs 731 kcal in Asia), and no practical difference when 115mm ≤ MUAC < 125mm (1,013 in Africa, 1,011 in Asia) (see Figure 4 online).

MUAC dosage table

The ComPAS expert panel met to review these results from January 26-27 2016. They agreed that MUAC was a suitable alternative to weight to determine the dosage of RUTF as children progress through treatment. The Combined Protocol will admit all children who have a MUAC<125mm and/or oedema, and treat them according to the following simplified dosage protocol:

- Children with a MUAC <115mm or oedema (+) to receive two sachets of RUTF per day (1,000 kcal);
- Children with a MUAC 115mm- <125mm to receive one sachet of RUTF per day (500 kcal).

This protocol remains in line with globally accepted practice, with children recovering from SAM receiving enough therapeutic food to cover their total energy needs (as a replacement for the family diet), whereas children with MAM receive a food supplement to complement their family diet. Most SFP protocols provide 500-550 kcal/day of ready-to-use supplementary food (RUSF). The advantage of using one product is simplicity (currently procurement of RUTF and RUSF involves separate UN agencies) and physiological appropriateness, considering acute malnutrition on a continuum of severity rather than as separate SAM/MAM conditions.

When tested in a theoretical comparison (Table 3 online), the protocol performs as designed (i.e. meets the total energy needs for >95% of children with a MUAC <115mm, and meets approximately half the energy needs for >95% of children with a MUAC 115-<125mm) for all major sub-divisions of children (by sex, country, continent, weight and admission type). Of note:

- At 95% of visits, children with MUAC < 115mm in the specified category have 100% of their energy needs covered by two sachets of RUTF (1,000 kcal) per day. Two categories of children fall slightly short of this goal: children aged 25 months or more (93%) and children who weigh 8.0kg or more (83%). Even in these two groups, only at 5% of visits do children have less than 96% of their caloric needs covered by two sachets of RUTF per day.
- At 95% of visits, children with a MUAC of 115mm -< 125mm have 50% or more of their total energy needs met by the provision of one RUTF sachet (500 kcal) per day. In both Asia and Africa, we estimate that 49% of total energy needs or more are met at 95% of visits. Children aged 25 months or over and children who weigh 8.0kg or more again fall short of this goal, but not by a startling amount: only 5% of children aged 25 months or more and children who weigh 8.0kg or more have 40% and 42% respectively (or fewer) of their energy needs covered to achieve observed growth. However, the provision of RUTF 500kcal per day matches the current global MAM management practice of providing 500 kcal of RUSF per day, so the same gap exists with the existing SFP protocol. The nutrient compositions of RUTF and RUSF are not exactly the same (RUTF has more dairy and RUSF has a higher content of macro-minerals, important for linear growth), but RUTF has been proven effective in the treatment of MAM (Maust et al, 2015).

Overall, 97% of children with MUAC < 115mm in the observational data would have their total energy requirements to achieve observed growth met or exceeded by the proposed protocol. The median percentage of their energy needs covered would be 170% (i.e., they would receive 70% more calories than needed to achieve observed growth), and 95% of children with MUAC <

115mm would have at least 111% of their energy needs covered by the protocol.

Consistent with the design, 95% of children with 115mm-< 125mm would have 49% or more of their energy needs covered by the proposed protocol, with a median of 74% of their energy needs covered. In both Africa and Asia, this simplified dosage protocol meets or exceeds the vast majority of children's energy needs when children have MUAC < 115mm and is aligned with the current practice of SFP programmes of providing at least 50% of children's energy needs when children have a MUAC between 115-<125mm.

Supporting figures and tables for results are available online at: www.ennonline.net/fex/specific-reference.

Conclusion

This study considered the rate of weight and MUAC gain and energy needs of children with acute malnutrition as defined by MUAC status. Our findings concluded that two 92g sachets of RUTF (1,000 kcal) meet the total energy requirements for >95% of children with a MUAC<115mm, and one 92g sachet of RUTF (500 kcal) meets half the energy requirements for >95% of children with a MUAC of 115-<125mm, and serves to simplify and streamline the treatment to be tested in a combined protocol.

The next phase of ComPAS aims to examine the effectiveness and cost-effectiveness of this simplified protocol. Stage 2 will pilot the combined protocol in a cluster randomised controlled non-inferiority trial in two countries to assess the effectiveness of the combined protocol against the standard protocol (OTP + SFP) in terms of recovery (with enrolment and discharge based on MUAC), coverage, length of stay, and average daily weight gain and weekly MUAC gains. A comprehensive cost-effectiveness analysis will be included as part of the field trial.

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Beneficiaries on the site of redemption

Adapting a resilience improvement programme in conflict: Experiences from Yemen

By Mustafa Ghulam and Mohammed H Alshama'a



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Location: *Yemen*

What we know: Emergency response in fragile state contexts is complex; Yemen is currently in a state of acute crisis against a backdrop of long-term political and nutritional volatility.

What this article adds: A three-year Save the Children programme in Yemen was designed to strengthen household resilience and improve infant and young child feeding (IYCF) and care and hygiene practices in an insecure (though stable) context. Two years of programming involved a food-for-assets scheme (vouchers in exchange for community-identified assets development) and mother-to-mother support groups. Community feedback mechanisms and impact monitoring were established. Communities reported high coverage of benefits from roads and water projects (assets). Deterioration to a crisis situation in year three led to needs reassessment and adaptation to an unconditional voucher programme that served almost twice as many beneficiaries compared to the conditional transfers. Household Dietary Diversity Score rose and Household Hunger Score fell. The electronic food-voucher programme, established in the community assets scheme, was key to the feasibility of scale-up.

Context

In 2013, the United States Agency for International Development (USAID) Office of Food for Peace (FFP) provided three years of funding to Save the Children International (SCI) to implement a programme with the objectives of strengthening household resilience and improving infant and young child feeding (IYCF) and care and hygiene practices in Dhamar and Sana'a governorates. The original programme strategy sought to layer and integrate activities so that the short-term food security needs of vulnerable households were met with conditional food vouchers, while establishing long-term resilience through rehabilitating or improving community-level assets and improving IYCF practices at the community level.

However, with the outbreak of fighting in March 2015, the project was forced to adapt to a rapidly changing context. As a result, the programme adjusted its programme objectives and activities to meet immediate humanitarian needs. This article recounts how a resilience-building programme successfully adapted to a rapidly emerging humanitarian crisis.

Programme rationale and design

When the programme was designed in 2013, Yemen was facing a different set of challenges to the one it faces today. While the political and security climate was still volatile and pockets of humanitarian need existed in the country, development policies were focused on resilience-building programmes. The focus of many development agencies and funders was on solving issues of dwindling water resources, child health, nutrition and education and seizing opportunities for livelihood security. In that context, this programme was originally designed with two immediate results (IR) in mind. The first IR focused on improvement of

community-level resilience through food-for-asset (FFA) activities. The second IR focused on the adoption of key IYCF, care and hygiene practices in the community.

The project targeted a part of the country where communities were largely rural and scattered across mountain tops and valleys, with limited market access. Most households relied on various seasonal labour options for income, supplementing these incomes with the sale of small animals and/or support from the government social protection programme. The project sought to work with 150 communities over three years. To optimise operations, clusters of villages and households took part in asset-improvement activities for six months, after which the programme would move on to another village. In its first two years, the FFA programme benefitted 7,350 households and built or rehabilitated 436 community assets in Dhamar and Sana'a. But in the third year alone, the programme drastically ramped up operations and managed to nearly double the number of households served.

IYCF and hygiene-promotion activities were expected to continue across all programme areas for the whole three years of the programme. The programme also organised training for Ministry of Public Health and Population staff (MoH) on referral systems and nutrition services at health facilities. With the support of the MoH, SCI established 169 mother-to-mother support groups (MTMSGs) in target villages. These are groups of women helping new mothers care for their children through model-optimal breastfeeding practices and sharing information and experiences, and by offering support to other women in an atmosphere of trust and respect. Group leaders create awareness among members about exclusive breastfeeding practices and complementary feeding for infants and young children during regular meetings.



Vocational skills trainees with their kits

Mobilisation and targeting

The mobilisation and targeting process took place in partnership with district-level leaders. It began by ranking districts based on vulnerability criteria, including proximity to markets, income options, access to water and access to previous assistance. At the sub-district and village level, another round of mapping, ranking and targeting using the same set of criteria was completed with local authorities and community leaders. The geographic and administrative targeting process not only ensured that vulnerable communities were targeted, but also enabled community buy-in before the village and beneficiary selection process.

Community Resilience Committees (CRCs) were formed in each village and acted as the primary interface between the programme and the community. Their key responsibilities were to advise on community-specific programme decisions, identify target beneficiary households, and communicate programme messages to the community (i.e. work and distribution schedules). A Memorandum of Understanding (MOU) outlining roles and responsibilities was signed between SCI and CRC before the start of the asset-improvement project. Village committees included men, women and youth. CRCs were less involved with the IYCF activities, but helped communicate the intention of this part of the programme to the community.

Box 1 FFA Beneficiary Targeting Criteria

1. Households with two or more children under the age of two years
2. Households with more than seven members
3. Households with no livestock
4. Households with no or small parcels (maximum 0.5 acres) of arable land
5. Female-headed households
6. Households with a high number of school dropouts

The CRCs were trained on targeting criteria and generated lists of beneficiaries that met the criteria developed by SCI (see Box 1). SCI would audit the list by randomly selecting 15% of households on each list to visit and verify eligibility. If there was evidence of systematic errors in targeting, CRCs were required to start the process again. In addition, beneficiary selection criteria were displayed throughout the village, which also helped make the process transparent.

Targeting vulnerable households to participate in the FFA project was conducted with the aid of village poverty-ranking indicators in addition to SCI-developed criteria. Roughly 80% of households were selected from each village. Unconditional transfers were provided to those who were very poor and had no labour to enable them to participate in the asset-improvement project. About 10% of the total beneficiary list was made up of this group. Typically, women from female-headed households did not work on the FFA activities, instead sending male surrogates in their place, or were included in the unconditional food-assistance transfers. In some cases, women assisted in providing food and water during workdays. This practice was in line with local traditions and customs. Roughly 18% of beneficiaries were women (see Table 1).

FFA and skills development

Assets built or rehabilitated by the programme were identified through broad-based community meetings facilitated by CRCs and SCI staff. Each asset-improvement project, which was endorsed by a majority of the participants and was in line with the programme's mandate, was documented in a village resolution.

One family member from each of the 7,350 households was engaged in the asset-improvement project. These family members worked for ten days a month (four hours a day) to receive a monthly food voucher for their family. Many of the target population were rural, dependent on local, temporary, seasonal incomes; the asset work was another income strategy available to them. The value of the voucher was designed to provide a food basket to cover approximately 70% of an average-size family's food needs and could be exchanged with vendors at the local market at a time of their choosing. For some difficult-to-reach villages, vendors would hold a market day at a designated distribution site in the village. The cash value of the voucher was between US\$66 and US\$72, depending on the exchange rate and local commodity prices. Every registered household was entitled to six transfers, as per the design of the programme. The six-month period of FFA activities coincided with the seasonal lean period, a time when income-earning activities are limited; therefore the effort required of participants to receive assistance added to income-earning strategies at a time when the household had excess time to participate.

In the first year, the project utilised paper-based commodity vouchers, which were exchanged for a predetermined food basket by

Table 1 Profile of participants in the FFA project

Description	2014		2015	
	Male	Female	Male	Female
Governorate				
Dhamar	2,862	800	2,918	511
Sana'a	154	34	69	2
Total	3,016	834	2,987	513

vendors in local markets. These vendors were vetted and entered into an agreement with SCI prior to the distribution. In the second and third years, the programme took part in a pilot MasterCard e-voucher solution. This provided a chip-enabled card loaded with a token that allowed beneficiaries to access the same predetermined food basket as the paper vouchers from local vendors. Vendors were equipped with and trained in the use of tablets and dongles that worked much like a point-of-sale system. Once beneficiaries satisfied their work requirements under the FFA programme, a token was deposited in their account that could later be exchanged with a vendor for their food items at a time convenient to them. A back-end accounting system reconciled the token exchange, which informed quantity of payment to vendors. The system was designed to work on or offline, though most of the time data was synched offline. This consisted of SCI programme staff travelling to vendors to synchronize the transaction history with another device before returning to the field office to upload. The pilot started with 100 households and scaled up to 6,050 households per month. If necessary, the e-voucher programme could add other tokens with different vendors to meet the need of other programmes.

With the support and guidance of CRCs, SCI engineers designed asset-rehabilitation specifications. Once the project's specifications and work plan were finalised, a bill of quantity detailing necessary materials and labour requirements was signed with CRCs. While the asset project was underway, SCI engineers provided technical backstopping to the CRCs, who monitored attendance and quality of work performed.

Quality monitoring

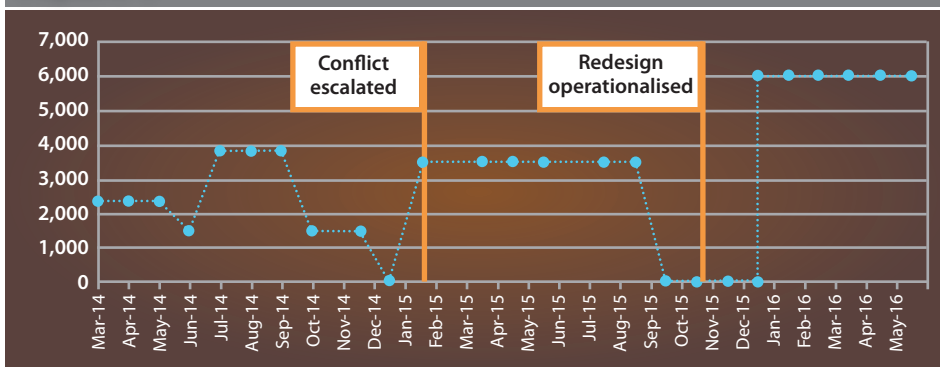
To ensure programme quality, the SCI Monitoring, Evaluation, Accountability and Learning (MEAL) team followed the project and measured progress against pre-identified output indicators. The use of Indicator Performance Tracking Tables (IPTT) and Budget versus Actuals (BVA) management tools allowed the programme to take corrective action when projects veered from their plans.

Accountability to the beneficiaries was a key component of the SCI monitoring and quality assurance system. It involved giving beneficiaries the opportunity to influence key programme decisions and highlight problems with programme activities. In addition to participating in CRCs, beneficiaries could provide feedback to SCI on any aspect of the programme through a complaints mechanism. This initially consisted of comment boxes, which were promoted during



Redemption of points

Figure 1 Beneficiary household caseload over three years



the community mobilisation process. In the third year, SCI introduced a national, toll-free hotline to the complaint mechanism that allowed beneficiaries another avenue to provide feedback. Each method allowed a person to provide input anonymously if they so wished. These mechanisms not only enabled SCI to deliver a quality programme; they also empowered the communities to participate and address their concerns with the programme at any time. The complaint mechanism produced three key issues: inclusion errors, request of information for date and time of distributions, and concerns about food quality. Because these mechanisms were in place, the SCI team could quickly learn about beneficiary complaints and rapidly find a resolution to the issue.

In addition to complaint mechanisms, SCI also conducted Post Distribution Monitoring (PDM) surveys for all target villages. The surveys inquired about beneficiary's perception of the distribution process, security concerns, and knowledge of complaint mechanisms. Each PDM also measures the Household Dietary Diversity Score (HDDS) and Household Hunger Score (HHS). In order to ensure quality in the delivery of programme outputs, SCI developed quality benchmarks that drew on international standards, such as Sphere, as well as the organisation's global expertise. Regular field visits were conducted to measure the project's performance against these standards.

Adapting to a changing context

With the outbreak of fighting in March 2015, Yemen faced large-scale displacement, civil conflict, food insecurity, high food prices, diminishing resources, and an influx of internally displaced persons (IDPs). In addition to airstrikes throughout the country, ports, which are crucial for importing key commodities such as wheat, cooking oil and petrol, were blockaded by the Saudi-led

coalition. As a result, market supplies quickly dwindled, pushing food prices higher.

After the conflict began, Dhamar governorate was categorised as Integrated Food Security Phase Classification (IPC) level 3 (crisis). Nearly half the population in Yemen was food-insecure prior to March, and the situation significantly worsened as a result of the conflict. At the time of writing, it is estimated that more than 21.4 million people, including three million IDPs, are in need of humanitarian assistance in Yemen. Emergency food assistance became a top priority in the programme area.

The deteriorating situation in the second and third year of the programme posed massive operational challenges. First, the security situation required senior leadership for most international organisations to evacuate to Amman in Jordan, which slowed decision-making processes. Yemeni staff were regularly forced to shelter in place and unable to visit programme areas due to safety concerns. With staff periodically immobile,

there was a limited flow of assessment information for decision-making purposes. Finally, field operations were challenged with shortages of fuel and other commodities and destabilisation of the Yemeni currency, the rial.

Despite these barriers, rapid assessments were still able to take place in accordance with security advisories. Once gathered, information was compiled and disseminated in Yemen and Amman. Information was regularly shared within the United Nations (UN) cluster system. Field teams were frequently tasked with following up on information related to their area of operation. Management provided remote technical backstopping and addressed all issues as quickly as possible to ensure the programme moved forward.

It was clear from the assessment information that the programme would need to shift its focus towards addressing immediate humanitarian needs and away from resilience-building activities. In order to adapt to growing food-assistance needs and the changing operational context, the community asset projects were dropped. It was determined that continuing the FFA portion of the programme would put staff and beneficiaries at risk. As a result, the programme was redesigned to scale up unconditional food assistance to meet the growing need. SCI planned to reach IDPs and local host communities to address their immediate food needs through electronic voucher transfers. The resources saved by dropping the FFA component of the programme allowed the beneficiary caseload to increase by about 75%; from 3,500 households per year to 6,050 households in the third year alone. Figure 1 shows the number of households that were assisted before and after the decision to change the design of the programme was made, in consultation with the donor.

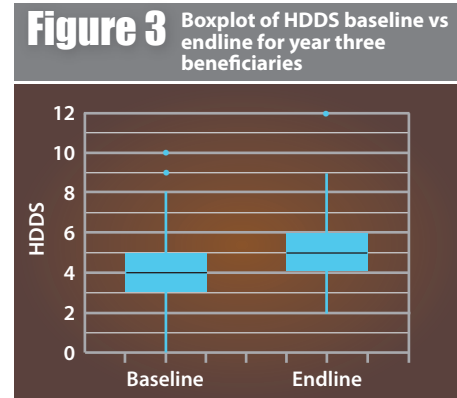
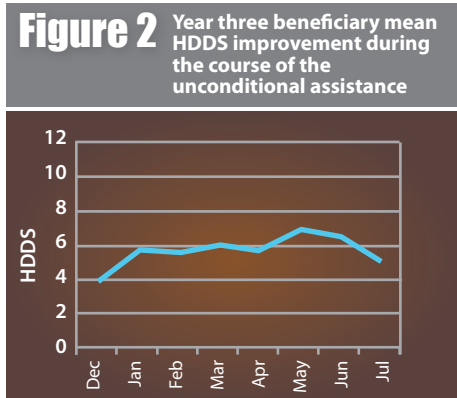
Cash transfers were considered, but the programme retained the e-voucher scheme because it was considered more appropriate with sharp fluctuations in market prices, supply chain disruptions and depreciation of the rial. To facilitate food assistance in the target programmes, SCI began to negotiate directly with national food distributors to ensure local vendors were provided with the required food and timely delivery. The programme continued to use the MasterCard system, which proved to be agile enough to



IYCF training - preparation of different types of food



Beneficiaries receiving food vouchers



meet the demands of a rapid scale-up of beneficiaries. In fact, having an established electronic food-voucher programme in place was key to the programme’s ability to scale up assistance.

Impact

Through paper and electronic vouchers, 13,400 households (around 93,800 individuals) were able to receive wheat (50 kg), beans (12 cans), cooking oil (4 litres) and rice (20 kg) on a monthly basis for at least six months. Perhaps the most interesting insight from the programme endline survey is how household vulnerability and hunger changed during the course of the programme. Endline data showed that the mean HDDS, which is used as a proxy measurement of household socio-economic status, increased by 31% compared to the baseline. Using the HHS, households with no or little hunger increased by 76%, while severe hunger fell to zero. These improvements in food-security outcomes came despite a major conflict and disruptive markets.

The mean HDDS trend throughout the third year of the programme clearly illustrates how the emergency assistance supported beneficiary households during the course of the programme (see Figure 2). At the time of the baseline, mean HDDS for the beneficiaries in the third year of the programme was 3.88. While households received food assistance (January to June 2016), HDDS scores temporarily elevated to between 47% and 51% of the baseline. The endline HDDS measurement, which took place one month after the last distribution in July 2016, fell to 5.07. It is unknown how far the HDDS has fallen since the end of the programme. While there is no clear cut-off for this measure, the increase in mean HDDS while households were receiving assistance and some lingering effects of elevated HDDS after the assistance stopped indicates that the food assistance relieved economic pres-

sure and reduced vulnerabilities for the target households.

It is important to note that each measurement was taken with a new cross-sectional random sample of the beneficiary population; therefore some changes in mean HDDS between each round of measurements are likely due to sampling variance. Additionally, the programme was unable to capture non-beneficiary HDDS scores to understand the likely impact of the programme. Despite those limitations, a Welch approximation test showed that mean HDDS between the baseline and endline were not equal: $t(1074.4) = 13.285; p = 0.001$. The boxplot in Figure 3 shows the difference in the HDDS distributions between the baseline and endline. It is clear from this plot that the central tendency for the endline measurement of HDDS shifted upwards and the variance was reduced. Levene’s test indicated the variance was not equal between the two groups; $p < 0.001$.

In the first two years, prior to the outbreak of conflict, the community asset-improvement projects contributed to increased access to water assets, improved market access through repaired roads, and improved water harvesting through repair of agriculture and rehabilitation of terraces. More than 430 asset projects were successfully implemented (see Table 2).

During years one and two of the programme, 80% of year one beneficiaries and 95% of year two beneficiaries sampled indicated they benefited from the community assets projects, especially those related to water and road projects. Surprisingly, some beneficiaries from the third year of the programme who were not in villages that directly benefited from the FFA activities also reported that they benefited from the community asset-improvement projects from previous years. This most frequently happened when roads were

able to link multiple communities to markets and highways. Eighty-six per cent of those who were provided with some type of road asset saw an improvement in travel time. All those who received some type of water asset saw improvements in agricultural and livestock production. Some beneficiaries asserted that working on community assets gave them an opportunity to recognise the value of cooperation and that they can replicate similar activities in the future. Finally, both hygiene and breastfeeding education were mentioned as an intervention with lasting effects; 77% of the respondents expect the MTMSGs to continue to function¹.

Conclusions

In March 2015, the conflict in Yemen forced SCI’s USAID-funded, resilience-strengthening programme in Dhamar and Sana’a governorates to reassess beneficiary needs and adapt the programme design to meet a growing humanitarian crisis and changing operational environment. Key challenges during this period included a deteriorating security situation for programme staff and beneficiaries, rapidly increasing prices, limited commodity supplies and devalued local currency. Further, the outbreak in violence required senior management to evacuate the country and limited field staff movement within operational areas.

In the face of these challenges, there was still a window of opportunity to adapt the programme to the context and provide much-needed food assistance. As a result, the community asset-improvement activities were replaced with an emergency food-assistance programme that served almost twice as many beneficiaries. Monitoring data collected throughout this period showed a measurable increase in HDDS for target beneficiaries and a decrease in the HHS.

Key to the programme’s success was the field staff’s willingness to leverage its experience and community network to mobilise and gear up beneficiary selection. The use of MasterCard’s electronic food-voucher programme in the first two years also provided the infrastructure that allowed for new activities to easily scale up to meet the programme’s need.

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¹ While baseline and endline IYCF assessments were made, different methods were used, which has limited comparison.

Table 2 Assets improvement projects by year

Assets improved	Year 1	Year 2	Total
Rehabilitation of terraces (by village)	139	120	259
Road linkages established	2	18	20
Water points established and rehabilitated	0	29	29
Road sections rehabilitated	8	73	81
Water-harvesting channels rehabilitated	2	12	14
Surface water pools rehabilitated	2	31	33
Total	153	283	436



President of Turkey Recep Tayyip Erdogan and Secretary-General Ban Ki-moon pose with children during the closing ceremony of the World Humanitarian Summit, Istanbul, Turkey 2016.



©World Humanitarian Summit

Location: *Global*

What we know: Inadequate resources are a severe and increasing constraint on humanitarian action in the face of increasing emergencies due to conflicts, natural disasters and disease.

What this article adds: The 'Grand Bargain' is a package of reforms to humanitarian funding launched in May 2016 at the World Humanitarian Summit. It comprises 51 'commitments' to make emergency aid finance more efficient and effective, endorsed by 34 agencies. It requires innovation, greater efficiencies, more resources and enhanced collaboration between existing and new partners. It is estimated to produce annual savings of US\$1 billion within five years (5% of current spending). Both opportunities and limitations have been raised.

Grand Bargain: Reform or business as usual?

Summary of commitments¹ and review²

Introduction

The 'Grand Bargain' is the name given to a package of reforms to humanitarian funding, launched in May 2016 at the World Humanitarian Summit. A group of 34 representatives of donors and aid agencies (which together provide the 'lion's share' of global emergency aid funding) produced 51 'commitments' to make emergency aid finance more efficient and effective. The Grand Bargain is presented as a collective action to address the shortcomings of under-resourced humanitarian response which requires innovation, greater efficiencies, more resources and enhanced collaboration between existing and new partners across the humanitarian 'ecosystem'. It identifies a need to move from the present supply-driven model dominated by aid providers to a demand-driven model more responsive to the people being assisted. Commitments are packaged under ten measures/areas for reform. It is estimated that the Grand Bargain agreement will produce annual savings of US\$1 billion within five years, which equates with 5% of current spending.

A recent IRIN³ report suggests the package has had a mixed reception. Some, like Dutch development minister Lilianne Ploumen, feel the bureaucracies involved did well to agree on so much in a few short months, given the complexities of budgeting and contracting emergency aid. Others point to a lack of more specific actions tied into timelines and targets: "It could be the Grand Bargain for business-as-usual unless there are more specific actions" (Christina Bennett, Overseas Development Institute). The author of the review outlines some opportunities and limitations around the ten key areas of reform, including:

1. Greater transparency

The pledge is to "publish timely, transparent, harmonised and open high-quality data on humanitarian funding within two years". The International Aid Transparency Initiative (IATI) data model is likely to be the agreed format. Several major donors already publish at least some of their information in this format, which should help accountability both upwards to the donor and downwards to aid recipients.

2. More support and funding tools for local and national responders

Only 0.4% of emergency funding currently goes directly to local and national operators, so the target of 25% by 2020 is high. Southern NGOs will likely receive more funding, on better terms, but will not easily 'shake off' the sub-contracting relationship with the United Nations (UN) agencies and large, international, non-governmental organisations (NGOs).

3. Increase the use and coordination of cash-based programming

There are no firm targets for the expanded use of cash, despite studies saying it is now beyond question that it works⁴. According to the author, the Grand Bargain text is contradictory: it claims that "using cash helps deliver greater choice and empowerment to affected people and strengthens local markets, but remains under-utilised", while at the same time calling for further research to better understand its risks and benefits.

4. Reduce duplication and management costs with periodic functional reviews

The agreement states that "reducing management costs depends upon reducing donors and aid organisations' individual reporting require-

ments and oversight mechanisms". There is tension between donors wanting their grantees to trim costs, and recipient aid agencies blaming donor bureaucracy for adding to those costs. Donors should 'harmonise' boilerplate grant agreements. Aid agencies should commit to being more open about their real costs "by the end of 2017" and meanwhile find savings from sharing costs such as transport, logistics, information technology (IT) and insurance.

5. Improve joint and impartial needs assessments

Significant efforts have been made to strengthen the quality and coordination of humanitarian needs assessments used for strategic decision-making, but critics claim that aid agencies too often get to define the scale of the problem, pick where they wish to intervene and set their price tag. The Grand Bargain tackles only a part of the problem of overlapping and duplicative assessments; donors and aid agencies are to "provide a single, comprehensive, cross-sectoral, methodologically sound and impartial overall assessment of needs for each crisis to inform strategic decisions on how to respond and fund thereby reducing the number of assessments."

¹ *The Grand Bargain – A Shared Commitment to Better Serve People in Need*. Istanbul, Turkey. 23 May 2016. consultations.worldhumanitariansummit.org

² *Is the Grand Bargain a Big Deal? A deal to sort out emergency funding meets with a mixed response*. By Ben Parker, Head of Enterprise Projects, IRIN. www.irinnews.org/analysis/2016/05/24/grand-bargain-big-deal

³ Originally the Integrated Regional Information Networks, IRIN left the United Nations in January 2015 to relaunch as an independent, non-profit media venture. See www.irinnews.org/

⁴ www.odi.org/projects/2791-humanitarian-cash-cash-transfers-high-level-panel-humanitarian-cash-transfers

De-linking assessment from response, for example by commissioning independent assessments, was proposed in earlier drafts but not included in the final text.

6. A participation revolution: include people receiving aid in making the decisions which affect their lives

The end customers of aid often have little choice or influence in the services they get, and feedback mechanisms so far have had little impact in changing programme delivery. The agreement invokes two different sets of guidelines for this, the Core Humanitarian Standard and the Inter-Agency Standing Committee (IASC) Commitments to Accountability to Affected Populations. Donors will have to agree that programmes can change as a result of community feedback, while aid agencies have to show how they incorporate it into their programmes.

7. Increase collaborative, humanitarian, multi-year planning and funding

Aid agencies often find themselves presenting similar programmes to donors year after year that have no longer-term goals; a process that wastes time and effort. Most humanitarian funding is issued on a 12-month cycle. The Grand Bargain target is for five countries to trial multi-year planning and funding by the end of 2017.

8. Reduce the earmarking of donor contributions

Donors typically earmark funds to specific projects, but this can become wasteful and encourage micro-management. The Grand Bargain suggests that various types of pooled funding mechanisms will expand; e.g. the UN's Central Emergency Response Fund (CERF) is likely to

rise to US\$1 billion a year⁵. The goal to reduce earmarking is worded without much promise of enforceability: "The aim is to achieve a global target of 30% of humanitarian contributions that are non-earmarked or softly earmarked by 2020." Measurable progress on this will depend heavily on classifications of earmarking.

9. Harmonise and simplify reporting requirements

The text puts more onus on the donors: "simplify and harmonise reporting requirements by the end of 2018 by reducing [their] volume, jointly deciding on common terminology, identifying core requirements and developing a common report structure".

10. Enhance engagement between humanitarian and development actors

Combining emergency and development funds and agendas is a hot topic. The text addresses this: 'it is about working collaboratively across institutional boundaries on the basis of comparative advantage'. The general intent is broad: "use existing resources and capabilities better to shrink humanitarian needs over the long term with the view of contributing to the outcomes of the Sustainable Development Goals (SDGs)". This will need to be the focus not only of aid organisations and donors, but also of national governments at all levels and civil society and the private sector.

Conclusion

According to the author, two of the ten areas covered – transparency and funding of local and national aid agencies – have gone further than others. On transparency, the Grand Bargain 'group' committed to publish their financial

data in a common open format within two years. Major reform on cash-based aid and needs assessments did not materialise.

The following donors and aid organisations endorse the Grand Bargain:

Australia, Belgium, Bulgaria, Canada, Czech Republic, Denmark, European Commission, Germany, Italy, Japan, Luxembourg, The Netherlands, Norway, Poland, Sweden, Switzerland, United Kingdom, United States of America

Food and Agriculture Organization of the United Nations (FAO), InterAction, International Committee of the Red Cross (ICRC), International Council of Voluntary Agencies (ICVA), International Federation of Red Cross and Red Crescent Societies (IFRC), International Organization for Migration (IOM), Steering Committee for Humanitarian Response (SCHR), United Nations Children's Fund (UNICEF), United Nations Development Programme (UNDP), United Nations Entity for Gender Equality and the Empowerment of Women (UN Women), United Nations High Commissioner for Refugees (UNHCR), United Nations Population Fund (UNFPA), United Nations Office for the Coordination of Humanitarian Affairs (OCHA), United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), World Bank, World Food Programme (WFP)

The World Health Organization (WHO) will lead a discussion on the Grand Bargain commitments with its Member States.

⁵ 2015 CERF funding amounted to US\$469,650,008. Source: www.unocha.org/cerf/cerf-worldwide/funding-sector/funding-sector-2015

Call for experiences on mothers measuring MUAC

Are you using the mothers measuring mid upper arm circumference (MUAC) approach or do you know someone who is? If so, we want to hear from you!

Action Against Hunger, in partnership with ALIMA, is compiling a lessons-learned document detailing the use of this approach worldwide, building on the existing evidence (Alé et al, 2016) and guidance (ALIMA, 2016). Evidence from Niger has shown that caregivers are able successfully to measure MUAC and are not inferior to community health workers (CHW), with children being admitted to care earlier and requiring fewer hospitalisations. Additionally, this approach has been

shown to cost less to implement than the traditional CHW-led approach.

Since this evidence has been published, multiple implementers have adopted it worldwide. We would like to collect all the experiences to date from different contexts: how the evidence has been implemented, what works, and the challenges, supported by case studies. This will be used to guide others on how to implement the approach and overcome any associated challenges.

If you can contribute to this or know anyone who can, please contact Eleanor Rogers at e.rogers@actionagainsthunger.org.uk by November 15 2016.

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AuthorAID: A global network for early career researchers from low and middle- income countries

By Jennifer Chapin

Jennifer Chapin is Programme Manager, Research and Communications at INASP, an international development charity based in Oxford, UK. INASP works with a global network of partners in Africa, Latin America and Asia to support individuals and institutions to produce, share and use research and knowledge. Projects are running in 28 countries.

Indonesian researchers involved in the AuthorAid programme



“...being an AuthorAID mentor goes beyond a conventional teacher-student relationship – it is a really stimulating and worthwhile learning process for both mentee and mentor”
Dan Korbel, UK

Researchers in the developing world have long been under-represented in published research. This is not a huge surprise. They face many of the same intense pressures to publish as academics in the UK, yet they lack access to the fundamental resources needed to communicate their research: information and training, writing support and mentorship. How can they manage the pressure of publishing rigorous scientific research and communicating findings in a way that meets publisher expectations?

In order to address some of these issues, the AuthorAID programme (www.authoraid.info) was launched in 2007 by the Oxford-based organisation INASP (www.inasp.info) to support researchers in low and middle-income countries to publish and communicate their work. It also serves as a wider global forum to discuss and disseminate research.

One of the cornerstones of AuthorAID is a popular **online mentoring system** (www.authoraid.info/en/mentoring) that allows volunteer mentors to use their crucial skills and experience to guide less experienced researchers through the challenges of publishing and communicating their research. Since the platform was set up in 2008, requests for mentoring assistance have intensified, and mentors are in demand. The platform is open to researchers from all subject areas and currently comprises almost 2,000 active mentors and mentees. Support is available in a number of languages, including English, French and Spanish.

The mentoring system helps pair together experienced mentors with researchers who need support at any stage of their writing project. It is easy to make contact with mentors or mentees: we have a ‘find a researcher’ search facility and our mentoring dashboard will automatically suggest suitable ‘matches’ based on subject and skills – rather like a dating website for researchers!

Fifteen of the most common types of support needed by new mentees include:

- Writing
- Article planning
- Proofreading
- Grant proposal development
- Language editing or proofreading support
- Career mentoring
- Theses and dissertation writing
- Literature reviews
- Study design
- Statistics
- Presentation planning
- Responding to peer review
- Publication ethics
- Technical reports
- Dealing with the publishing process

Over the years, AuthorAID has amplified its scope to provide support to researchers in a number of other ways:

- One primary aim is to **embed research writing skills training** in universities and research institutes, with the objective of building local training capacity face-to-face and online. We are currently working with ten partners in four countries: Ghana, Tanzania, Sri Lanka and Vietnam.
- In recent years, AuthorAID has launched free **Massive Open Online Courses (MOOCs)** in research writing. So far, these courses have attracted over 2,800 researchers from 76 countries (www.authoraid.info/en/e-learning).
- Small grants to host workshops and travel

to conferences are offered twice annually (www.authoraid.info/en/funding).

- Over the last year, AuthorAID has focused on supporting women in research to address gender inequalities they face in progressing in their careers. AuthorAID has recently produced a **Gender Mainstreaming in Higher Education Toolkit** (available online soon), which is hoped will be a valuable resource for universities and institutions tackling gender inequality in academia.
- AuthorAID also provides **training materials and resources** free of charge online. Resources are available in English, Arabic, Chinese, French and Spanish (www.authoraid.info/en/resources).
- An increasing number of our members also provide informal mentoring, advice and support by replying to questions about publishing on the **Discussion Group**, now numbering over 2,300 members.

Whether you’re an early career researcher in a developing country who could benefit from support and mentoring, an established academic with a strong track record who wants to give something back to the research community, or are just keen to get involved in some stimulating discussions, you can easily register now on the AuthorAID website at www.authoraid.info.

“My experience with AuthorAID has been great! Through the AuthorAID website, I met my mentor, a PhD student at the University of Michigan. She has been very dedicated in offering me guidance on how to improve my writing skills”
Rhone Ochako, Kenya

Accelerating the scale-up of treatment for severe acute malnutrition

By Saul Guerrero, Erin Boyd, Claire Harbron, Diane Holland, Abi Perry and Sophie Whitney



Saul Guerrero is the Director of Nutrition at Action Against Hunger UK (ACF UK). Prior to joining ACF, he worked for Valid International supporting UN agencies, NGOs and national governments in the design, implementation and evaluation of community-based management of acute malnutrition interventions in over 16 countries in Africa and Asia. In 2012 he co-created the Coverage Monitoring Network (CMN), an inter-agency initiative to evaluate the reach of nutrition services worldwide.

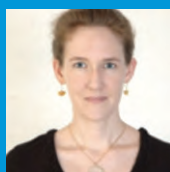


Erin Boyd is a Nutrition Advisor and instructor with experience in emergency nutrition response and covers policy, programme management, monitoring and evaluation, coordination and operational research. She has worked in nutrition surveillance, emergency nutrition

interventions, and coordinated responses in locations such as Darfur, Ethiopia, Haiti and Pakistan. She has also worked with donors and at the Friedman School of Nutrition Science and Policy at Tufts University.



Claire Harbron is a Manager at the Children's Investment Fund Foundation. She oversees CIFF's strategy and programme portfolio on the prevention and treatment of severe acute malnutrition.



Diane Holland is Senior Nutrition Advisor at UNICEF New York and has a focus on scaling up programming to treat severe acute malnutrition and addressing nutrition emergencies. She has over ten years' experience in public nutrition, including support to nutrition surveillance in Sudan,

nutrition policy in Afghanistan, and technical support in large-scale emergencies such as Typhoon Haiyan in the Philippines.



Abigail Perry is acting Nutrition Team Leader at the Department for International Development, UK. A nutritionist with extensive experience in development and emergency work, Abi has previously worked in a variety of technical roles for different NGOs and as a Research Associate at UCL.



Sophie Whitney is working as a Global Nutrition Expert for the European Commission Humanitarian Aid and Civil Protection (DG ECHO). She has extensive experience in nutrition, having worked for over 15 years in both headquarters and field positions in programme design, monitoring

and implementation. In her current role she is monitoring innovation and informing the nutrition policy to ensure aid efficiency in humanitarian crises.

Girls at a clinic in Bossaso, Somalia



WFP/Laila Ali

The last decade has been one of the most exciting in the global efforts to treat Severe Acute Malnutrition (SAM) at scale. In that period, we have seen a community-based model to treat SAM go from a small-scale but innovative pilot to a large-scale intervention in over 70 countries worldwide. We have seen the availability of revolutionary, ready-to-use therapeutic foods (RUTF) increase, with reductions in cost and a wider range of producers at global, national and regional levels. This has led to a rise in the number of SAM children accessing life-saving treatment worldwide from just over one million in 2009 to over three million in 2014. And all of these changes have occurred against a backdrop of increasing political support for addressing malnutrition worldwide, through platforms like the Scaling-Up Nutrition (SUN) movement and the formal inclusion of wasting as a key target in both World Health Assembly (WHA) and Sustainable Development Goals (SDG).

When we take stock of these and other achievements, we feel optimistic about the future. But we also know that the job is far from over. Nutrition-sensitive investments and programmes are on the rise, yet the evidence base for the prevention of acute malnutrition, in particular, remains limited and often inconclusive, hampering efforts to effectively link prevention and treatment efforts. The number of children accessing treatment has tripled in just five years, but is beginning to stagnate; today only one in every five children suffering from SAM has access to treatment, leaving the large majority of those affected at increased risk of mortality from associated illnesses.

This has to change, and the nutrition community, together with colleagues across health and other sectors, needs to do whatever it takes to ensure that a higher proportion of children have access to effective treatment. No single approach or solution will be sufficient and critical challenges across nutrition programming, policy and financing will need to be addressed.

Programmatically, community-based approaches for treating SAM must continue to be integrated into health systems and basic emergency packages. To do so, the specific measures required for these efforts to fully succeed need to be identified. For us, there are five key elements that must be at the heart of these efforts:

1. **Ensure that prevention and treatment of wasting is situated in all child survival packages.** As the drive to address childhood illnesses together continues, SAM cannot continue to be addressed in isolation. Its prevention and treatment must be formally and officially integrated in child survival packages once and for all.
2. **Maintain the focus on home-based models of care.** Outpatient approaches need to be formally integrated into national guidelines in all countries. The boundaries of service delivery models need to be pushed to ensure that services are accessible and equitable, including for those living in hard-to-reach areas.
3. **Modify and expand the ways in which SAM is diagnosed.** The way children suffering from SAM are identified must be simplified to enable a wider range of individuals (starting with the caretakers themselves) to find them and do so early.

4. **Optimise the specifications and dosage of specialised nutritious foods.** To make significant improvements in the cost-effectiveness of treatment, efficiencies and improvements in the way these products are made, what they contain and how much of it is used in the treatment of SAM must continue to be pursued.
5. **SAM information must be consolidated and made widely available.** Today, critical information about the context-specific factors that lead to acute malnutrition, the scale of the problem and the performance of the services dealing with acute malnutrition is either missing or inaccessible. As the Global Nutrition Report has highlighted, greater investments in SAM information, and the right platforms to make this information easily accessible to those who need it, are urgently needed.

Addressing these and other questions will require investment in innovative and bold ideas, and the capacity to generate evidence and identify what works in a timely manner, so that innovations can be mainstreamed in years, not decades.

The challenge of SAM treatment scale-up might often be defined in programmatic terms, but the solutions are, more often than not, political. At a time when the nutrition movement

is gathering pace, the issue of SAM is often lost in policy debates at a global level and fails to be included in national nutrition targets. To make SAM a political and public health priority, the nutrition community must do what we have recognised for years: get out of the echo chamber and start engaging consistently and actively with the wider public health community. Doing that will require us to be clear about what we want to see happen, in concrete terms, and to ensure that the benefits of putting SAM into child survival policy and practice are made explicit. This conversation is particularly critical at national level, for it is there that the impact of scaling-up SAM treatment will ultimately be most profound. Repositioning SAM as a key aspect of accelerating child survival will be about high-level dialogue, but it will ultimately be about translating dialogue into action and measurable commitments.

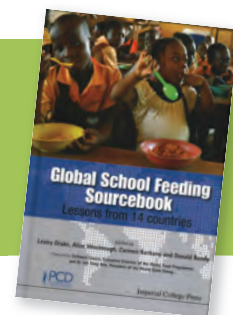
Delivering SAM treatment at scale will come at a cost. The recent projections made by the World Bank, Results for Development, 1,000 Days and others, have generated valuable insights into exactly how much will be needed to deliver SAM treatment at scale (\$1.8 billion a year) and how much is currently being made available (\$450 million in 2014). Addressing the deficit will require a step-change and the capacity to integrate SAM treatment into non-emergency, long-term funding streams

including (but not limited to) health financing. It will also require a gradual but sustained commitment from national governments to include SAM treatment costs into multi-year health budgets. Business, private sector companies and foundations also have a critical role to play, but in different ways to national governments and bilateral donors. Determining the added value of each in covering different components of treatment services (e.g. commodities, research & development and health system-related costs) will be the key to optimising the contributions of each actor and getting us closer to the mark.

And when all is said and done, that is our lasting answer: to unlock the global and national challenges we will need to bring our different skills, knowledge, geographical reach and diverse networks to bear on this very pressing problem. Only if efforts are coordinated and dialogue sustained on the opportunities and challenges we face, will we maximise the influence and impact we can leverage, and bring others on board to drive change. In this, the UN-designated Decade of Nutrition, we need to ramp up and coordinate our collective efforts to tackle severe acute malnutrition, thereby unlocking the wider benefits for child health and global development.

Watch this space...www.nowastedlives.org

Global School Feeding Sourcebook: Lessons from 14 countries



The Global School Feeding Sourcebook: Lessons from 14 countries was produced in response to demand from governments and development partners for guidance on designing and implementing large-scale, sustainable, national school-feeding programmes that can meet globally approved standards. The Sourcebook documents and analyses government-led school-feeding programmes to provide decision-makers and practitioners worldwide with the knowledge, evidence and good practice they need to strengthen their national school-feeding efforts.

Based on high-level collaboration with government teams from 14 countries (Botswana, Brazil, Cabo Verde, Chile, Côte D'Ivoire, Ecuador, Ghana, India, Kenya, Mali, Mexico, Namibia, Nigeria and South Africa), the Sourcebook includes a compilation of concise and comprehensive country case studies. Programmes are examined in terms of Five Quality Standards that are needed for school-feeding programmes to be sustainable and effective. These standards include: design and implementation; policy and legal frameworks; institutional arrangements; funding and budgeting; and community participation. The review highlights the trade-offs associated with alternative school-feeding models and analyses the overarching themes, trends and challenges that run across them.

The Sourcebook is free to download at www.hgsf-global.org and www.wfp.org



School feeding programme in Odisha, India

WFP/Aditya Arya

The missing ingredients: Are policy-makers doing enough on water, sanitation and hygiene to end malnutrition?



Introduction

Evidence shows that scaling up interventions that tackle the immediate causes of malnutrition is insufficient to overcome the challenge. A more comprehensive 'recipe' requiring a mix of 'ingredients' from multiple sectors is critical to address both the immediate and underlying causes of malnutrition.

A report from SHARE (Sanitation and Hygiene Applied Research for Equity) and WaterAid highlights why water, sanitation and hygiene (WASH) are essential for nutrition. An estimated 50% of undernutrition is associated with infections caused by poor WASH, contributing to 860,000 preventable annual deaths in children under five years of age. Evidence from a number of trials and observational studies has identified three biological mechanisms linking WASH to undernutrition, including repeated bouts of diarrhea, intestinal parasitic infections and environmental enteric dysfunction (EED). There may be other important WASH-related social and economic pathways.

Growing evidence of the links between nutrition and WASH has contributed to building momentum for better coordination, collaboration and integration. However, the definitions that different sectors, individuals and organisations use for 'integration' vary considerably along a continuum. This ranges from very minimal coordination and collaboration on one side through to a more closely integrated and jointly delivered programme on the other.

Through an analysis of both nutrition and WASH plans and policies in 13 Scaling Up Nutrition (SUN) countries (Bangladesh, Kenya, Liberia, Madagascar, Malawi, Mozambique, Nepal, Rwanda, Sierra Leone, Tanzania, Timor-Leste, Uganda and Zambia), the report evaluates the degree to which national strategies in both 'sectors' are integrated. It identifies gaps in coordination and ways of working, and where and how improvements must be made.

Method

Countries selected for analysis were based on SHARE's focus countries and WaterAid's country programmes, for which national, multi-sector nutrition action plans or strategies were freely available online. National, multi-sector nutrition action plans were the primary focus of analysis,

although national nutrition policies were also reviewed for a comprehensive picture. Pre-defined criteria used for reviewing action plans included:

- Is WASH recognised as an underlying and important factor in nutrition?
- Are all three components of WASH mentioned?
- Is there a budget outlined for WASH activities?

In addition, a keyword search of nutrition terms in the national WASH plans and policies of the 13 countries was conducted to allow for a basic assessment of whether the plans include nutrition considerations.

Key findings

WASH into nutrition varies widely. All the nutrition plans and policies that were analysed recognise the importance of WASH; however, the degree to which WASH is embedded within plans varies significantly across countries in terms of objectives, targets, interventions and indicators (Nepal and Timor-Leste have the strongest plans in terms of embedding WASH components).

Nutrition into WASH is limited. Very few WASH plans reference nutrition or identify opportunities to integrate with nutrition and health programmes and campaigns (with the exception of Liberia).

Limited budget information

Of the plans analysed, a detailed budget for activities was not generally included in the same document, limiting the ability to capture the budget for WASH activities. Where budget was available, this was provided at the level of the objectives or priority areas and not by activity; thus a detailed costing analysis was not possible within the scope of this research.

One size does not fit all. There is no single blueprint for how WASH should be embedded in nutrition plans, nor for how WASH programmes can be made more nutrition-sensitive. However, consideration of some key principles and approaches could help drive progress. For example, designing WASH programmes to target populations most vulnerable to nutrition and/or identifying opportunities to integrate activities such as those related to behaviours (e.g. personal and food hygiene and breastfeeding) could result in more joined-up approaches.

Continuum approach. Working together should be considered along a continuum, with different degrees or approaches to collaboration. This may range from simply sharing information and targeting different programmes to the same populations to a more integrated programme, involving the same staff and a single budget.

Challenges in working together. Inherent differences in the objectives, outcomes of interest and people involved in delivering nutrition and WASH programmes present a number of challenges to working together. Unlike those responsible for nutrition, the WASH sector is not dependent on nutrition action for achieving its primary objectives. However, both nutrition and WASH policy-makers share a common vision and goal of improving health, and evidence shows that public health aims have been a key driver of investments in WASH, particularly sanitation. Working together can also leverage investments across the two sectors to maximise health impact and improve cost-effectiveness. Plans and policies are a core part of the process of outlining the mechanisms and systems required to allow more cohesive working to advance nutrition and WASH goals.

The report uses findings from the analysis, along with existing evidence and lessons learned to date, to provide insights into the different ways of working to enhance nutrition and WASH coordination and collaboration across different stages of the policy cycle.

Recommendations

According to the report, comprehensive national nutrition plans are a critical first step toward ending malnutrition by 2030, but they must include all three WASH 'ingredients'. Moreover, these plans should be underpinned by sufficient financing, effective coordination, timely tracking of results and stronger institutions. The report makes specific recommendations on how partners – governments, UN agencies, donors, technical agencies and international NGOs and academics – can play their part to ensure an integrated approach to ending malnutrition.

An infographic on how well water, sanitation and hygiene are integrated into national programmes is available at: www.wateraid.org/uk/what-we-do/policy-practice-and-advocacy/research-and-publications



Nutrition funding: The missing piece of the puzzle

A recent report by Generation Nutrition, a coalition of 85 civil society organisations, describes both why funding matters to nutrition and the current situation with regard to donor funding and domestic resources. The report calculates that, at the current rate of progress, countries will miss the 2025 World Health Assembly (WHA) targets on stunting and acute malnutrition by a significant margin (see Table 1), let alone the more ambitious Sustainable Development Goals (SDGs). Increasing funding is essential if these and the other global nutrition targets are to be met on time. Progress in meeting the WHA stunting and wasting targets are respectively 20 and five years behind schedule.

In 2013, the UK hosted the Nutrition for Growth (N4G) event, a high-level summit resulting in over US\$23 billion pledged to improve nutrition up to 2020. This was a substantial commitment, but ultimately not enough to end malnutrition in all its forms, as promised by world leaders. The report by Generation Nutrition describes the 'London Legacy' as presenting challenges in relation to the implementation of the deal; for example, of the eight donors who supplied data on nutrition-specific and nutrition-sensitive aid spending in 2013, only 64% of the aid pledged for that year was actually disbursed. Moreover, the 2015 Global Nutrition Report, which tracks N4G commitments, revealed that 13 donors were spending either less than US\$1 million per annum or nothing at all on nutrition-specific programmes. Furthermore, only a relatively small share of donor budgets in supposedly nutrition-sensitive sectors is being targeted directly at improving nutrition – 3% out of 21% spend on health agriculture, WASH (water, sanitation and hygiene) and education.

The 2016 N4G summit in Rio de Janeiro did not turn out to be a pledging summit, as had originally been envisaged. The Generation Nutrition campaign is calling for the next high-level nutrition funding summit to be announced immediately and for all stakeholders to step up and pledge ambitious and SMART (Specific, Measurable, Achievable, Relevant and Time-bound) financial commitments. At this next summit, they want donors to agree to a doubling of global aid to nutrition by 2020, and for southern governments to agree to increase their budget allocated to nutrition, starting with (but not restricted to) the health sector.

Recommendations

Recommendations made in the report are in line with priorities from states and other donors who are part of the N4G initiative. They relate to measures which, if implemented, would help either to increase nutrition funding or to improve the impact of existing programmes.

All international donors

- To identify quickly a date and occasion for a new, high-level, pledging summit on nutrition, working together with southern countries.
- To ensure that the promises made at N4G 1 are fulfilled by keeping spending up to 2020 'on track'.
- To go further and commit to a doubling of global aid for nutrition, to be achieved by 2020 and based on a verifiable baseline figure (for instance, 2014 spending). A significant share of the increase should be for life-saving, nutrition-specific interventions.
- To improve the nutritional impacts of aid channelled to agriculture, education, health, water and sanitation, and social protection. This can be done by ensuring

that programmes include objectives on, and intended outcomes for, nutrition and that aid is targeted towards those most at risk of undernutrition.

For southern countries

- To support the inclusion of dedicated budget lines for nutrition within national health budgets.
- To raise the level of government expenditure in key nutrition-sensitive sectors, such as health, education, agriculture, water and sanitation, and social protection, and continue developing systems that can guarantee a minimum level of investment in nutrition (3% of national budgets).

For all stakeholders

- To announce measures to strengthen international, innovative, financing mechanisms and funds for nutrition. One example is UNITLIFE, an initiative for combating undernutrition, based on small-scale levies in the extractives sector (www.unitlife.org). The initiative is expected to generate US\$115 million a year in its initial phase. Mali was the first country to contribute, with a levy of 10% per gram of gold sold. Another example is the Power of Nutrition (www.powerofnutrition.org); allocations totalling US\$200 million have been made.
- To ensure that any new financial pledges are developed in a way that is SMART and makes their delivery easy to assess. For instance, all the money committed should represent additional spending.

¹ Nutrition Funding: the missing piece of the puzzle. A Generation Nutrition briefing paper. June 2016. www.generation-nutrition.org/sites/default/files/editorial/missing_piece_of_the_puzzle.pdf

TABLE 01 POOR PERFORMANCE ON THE WHA GLOBAL TARGETS ON STUNTING AND ACUTE MALNUTRITION					
World Health Assembly target for 2025 ^a	Current situation 2014 figures ^b	The gap	Annual average reductions needed to meet target on time ^c <small>(% weighting a reduction on global prevalence)</small>	Annual average reductions seen in 2011-14 period ^d	Based on current rate of decline, when will the WHA target be reached? ^e
STUNTING: 40% reduction in number of cases in under-fives = target of 99m cases ^a	159m	60m	5.08m	2m	2044 REPORTED ON IN 2045
WASTING: Reduce and maintain wasting to/at below 5% of under-five population ^a	7.5% 50m CASES	NO. OF CASES IS C. 50% TOO HIGH	0.24%	0.17%	2029 REPORTED ON IN 2030

Source: Generation Nutrition's own calculations based on WHO, UNICEF & World Bank Joint Estimates for 2011-14 period and WHA targets. CI: <http://www.who.int/nutgrowthdb/estimates/en/>



Breastfeeding advice session, Ethiopia

©Ashley Gilbertson/IFRC

Biofortification: Helping meet nutrition needs worldwide

By Dr Erick Boy, Nutrition Head, HarvestPlus



Dr Erick Boy is a public health practitioner and has a doctoral degree in nutrition from University of California, Davis. He currently heads the HarvestPlus nutrition programme, overseeing dietary intake and nutritional status surveys, as well as food science and epidemiologic research required to assess the nutritional merits of biofortification in Sub-Saharan Africa and South Asia. Before joining HarvestPlus he worked as chief scientific adviser at the Micronutrient Initiative (1999-2008).

Content for this article was secured by Charulatha Banerjee, ENN Regional Knowledge Management Specialist (Asia).

Vitamin A fortified maize



Eliab Simpungwe, Harvest Plus, 2012

Location: Global, India

What we know: Micronutrient deficiency is common in populations that rely primarily on staple foods; poor, rural communities are particularly affected.

What this article adds: Biofortification is the process of increasing the density of vitamins and minerals in a crop through plant breeding and agronomic practices, so that when consumed regularly the crops will generate measurable improvement in vitamin and mineral nutritional status. HarvestPlus is a global partnership programme that leads the global development and promotion of biofortified crops, involving crop development, work with policy-makers and engagement with communities. Biofortified crops can provide 30% to 80% of a woman's or child's daily needs of vitamin A, zinc and iron (key focus nutrients). Evidence is emerging on nutrition and health impact. Developments in India are promising for biofortification at scale. Biofortification now reaches more than 15 million people in Africa and Asia; new crop varieties are available/pending release in 55 countries.

Micronutrient deficiency is usually the result of consumption of monotonous plant-based diets composed predominantly of a starchy staple food (cereal, roots/tubers), which results in a lack of essential minerals and vitamins required for proper growth and development of the body. When large segments of a population are affected by micronutrient deficiency, their health and economic development are curtailed.

Biofortified staple crops rich in micronutrients are most beneficial to groups who are vulnerable to micronutrient deficiencies, especially infants, young children and pregnant and breastfeeding women. Deficiencies in micronutrients such as zinc, iron and vitamin A can cause profound and irreparable damage to the body, including blindness, growth stunting, mental retardation, learning disabilities, low work capacity and even premature death.

Biofortification can help in the prevention of micronutrient deficiencies. Biofortified crop varieties will eventually provide from 30% to 80% of a woman's or child's daily needs, depending on the nutrient and the amount of the bioforti-

fied food consumed regularly. Biofortification targets in particular the rural poor, who are more vulnerable to the underlying causes of undernutrition and consume large quantities of staple foods, often with little else.

HarvestPlus is a global partnership programme that leads the global development and promotion of biofortified crops (see Box 1). Together with local farmers and researchers, HarvestPlus develops and promotes staple crops that are climate-smart, high-yield and packed with micronutrients. HarvestPlus also works with policy-makers to develop programmes to promote the crops, and with communities to take the crops 'from fields to meals'.

Origins of biofortification: Intersection between nutrition and agriculture

Traditionally, economists believed that energy intake was the primary dietary factor constraining better nutrition outcomes in developing countries. This was the underlying premise of the 'Green Revolution' which, in the late 1960s, allowed farmers to increase their agricultural

output of mainly cereal grains such as rice, maize, and wheat. However, research by Dr Howarth Bouis, an economist at IFPRI and founder of HarvestPlus, found that vitamin and mineral intake in non-staple foods and animal products is more highly correlated with health outcomes. Making staple foods – on which poorer, rural communities were so dependent – more nutrient-rich could therefore contribute to addressing so-called 'hidden' hunger. This intersection between nutrition and agriculture led to biofortification, a movement that has brought ministries of health and agriculture under one roof (although it took two decades to achieve this). In many HarvestPlus target countries, these two ministries are coordinating closely to enable biofortification.

Biofortification in practice

Conventional plant breeding is not new. Early farmers chose the best-looking plants and seeds and saved them for next year's planting. As the science of genetics became better understood, plant breeders were able to select certain desir-

Box 1 About Harvest Plus

HarvestPlus began as a research ('challenge') programme of the global research partnership CGIAR (www.cgiar.org). It is coordinated by two members of the consortium, the International Food Policy Research Institute (IFPRI) and the International Centre for Tropical Agriculture (CIAT). In addition to IFPRI and CIAT, HarvestPlus works with more than 200 scientists, researchers and other experts around the world, working closely with scientists from International Maize and Wheat Improvement Centre (CIMMYT), International Institute of Tropical Agriculture (IITA), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), and the International Potato Centre (CIP) to select and breed biofortified crops. HarvestPlus nutrition generates the research required to consolidate the case for single-nutrient crops and extend its proof-of-concept approach to traditional combinations of biofortified crops.

Box 2 Developments in India

In India, HarvestPlus and its partners are developing new varieties of rice and wheat with increased amounts of zinc (and iron) and pearl millet with increased iron (and zinc) using conventional breeding. While there is a one-time cost fixed to developing these nutrient-rich varieties, which are also high-yielding, they can be grown by farmers and consumed year after year alongside other traditional foods.

Pearl millet is eaten daily by more than 50 million people in the semi-arid regions of India. The iron-rich pearl millet variety was developed in partnership with the ICRISAT in India. Through partners Nirmal Seeds and Shakti Vardhak, some 140,000 farming households were reached with

iron pearl millet seed in 2015. That included over 340 metric tons of the open-pollinated variety *Dhanashakti* and 13 metric tons of the hybrid variety *Shakti-1201*. Cumulatively, more than one million people across four states (Maharashtra, Rajasthan, Uttar Pradesh and Haryana) have accessed iron pearl millet in the three years since the first variety was released. For wheat-producing states, four zinc-rich varieties have been distributed to 35,000 farming households, thanks to partnerships with various seed companies. Farmers in the states of Uttar Pradesh and Bihar received and planted 350 metric tons of zinc wheat seed produced through Astha Beej Co, Sood Foods, Said Seeds and Shakti Vardhak.

able traits in a plant to create improved varieties. All the nutritious crops released or in the near pipeline through the efforts of HarvestPlus and its partners were or are being developed using conventional plant breeding.

Farmers do not have to make changes to grow biofortified crops. After the initial outlay of funds for development of the biofortified crops, the recurrent costs are minimal. Advantages are many: biofortification is built on what poor households, who likely have no access to or cannot afford commercially marketed fortified foods grow and eat (staple); there is a one-time-only investment to develop seeds that fortify themselves (which keeps recurrent costs low); the germplasm (the living tissue from which plants can be grown) can be shared globally; and biofortification produces higher yields in an environmentally friendly way.

In most cases, farmers will be able to save their seed and replant it, or grow new plants

from stem and root cuttings. Many crops, such as sweet potato, cassava, pearl millet and beans, can be replanted every year from plant cuttings or seed that the farmer has saved. In the case of hybrids, farmers usually purchase fresh seed for each planting season in order to maintain high productivity. Biofortified nutritious crops are being made available as public goods to national governments. Wherever these seeds are typically sold in markets, they are competitively priced so that subsistence and smallholder farmers can afford them. In the long run, the cost difference between these seeds and non-biofortified varieties should be negligible.

HarvestPlus approach

HarvestPlus focuses on three crucial micronutrients that are most limited in the diets of the poor: vitamin A, zinc and iron, and breed these into key staple crops. Thousands of different types of crop seeds stored in seed banks that have naturally higher amounts of iron, zinc and vitamin A are screened. Nutritional genomicists use tools such as marker-assisted selection to help speed up the breeding process. HarvestPlus uses these more nutritious seeds to breed new crop varieties with higher micronutrient content that are also high-yielding and have other traits farmers want.

These new varieties are tested in the target region, partnering with farmers to ensure buy-

in from the farming communities. Studies are conducted to ensure that these new crops have sufficient amounts of the nutrient needed to improve nutrition. The national government then officially releases the best-performing varieties of micronutrient-rich crops for farming communities to grow, eat and sell in local markets.

Experiences from India

The future of biofortification in India looks promising (see Box 2). The 2013-2014 budget in India allocated funds equivalent to 40 million US dollars to develop farms growing micronutrient-rich crops, reflecting India's plan to develop 'nutri-farms' where iron-rich pearl millet, zinc-rich rice and wheat, and protein-rich maize will be grown. India's strong scientific infrastructure is an asset in developing biofortified crops, while there are sophisticated marketing networks of seed companies that are essential to disseminate these crops. Policy-makers and other stakeholders are key targets of evidence generated on the nutritional benefits of biofortified crops and how this food-based approach can be effective in improving nutrition on a large scale. There are also ongoing efforts to leverage private and public sector partners and work out ways to mainstream biofortified crops in India.

Evidence of nutrition impact

With more people and countries adopting biofortified crops globally, evidence is emerging on the nutritional and health impact of these crops. Over the last few years, leading scientific journals have published studies that demonstrate the efficacy of biofortified crops (see Box 3). Nutrition data demonstrates that biofortified foods can reverse iron deficiency and reduce the incidence and duration of diarrhoea, one of the leading causes of preventable death in children under five years old. A small daily ration of orange sweet potato is enough to provide a young child with his/her daily vitamin A requirement.

Cost

The 2008 Copenhagen Consensus, comprising the world's leading economists, estimated the health benefit-to-cost ratio of biofortified nutritious crops as US\$17 of benefits for every dollar

Box 3 Selection of published evidence of nutrition impact

A 2015 study found that vitamin A-rich orange sweet potato (OSP) reduced both the prevalence and duration of diarrhea in young children in Mozambique (Hotz et al, 2012).

In India, pearl millet bred to be richer in iron was able to reverse iron deficiency in school-aged Indian children (Finkelstein et al, 2015). Previously, the same iron-rich pearl millet had been shown to provide iron-deficient Indian children under the age of three with enough iron to meet their daily needs, and to provide adult women in Benin with more than 70 per cent of their daily needs (Kodkany et al, 2013).

A study from Rwanda found that daily consumption of meals with beans bred to be richer in iron helped prevent and reverse iron deficiency in women in just four and a half months (Haass et al, 2016).

In Zambia, switching to orange maize, which is rich in beta-carotene, provided maize-dependent populations with up to half their daily vitamin A needs. In a controlled efficacy study, children who ate vitamin A maize showed significant increases in their total body stores of vitamin A (Gannon et al, 2014). There is also evidence that maize that has been bred to have higher zinc content can provide enough zinc for a growing child in their formative years (Chomba et al, 2015).



Vitamin A cassava compared with a less nutritious white version

HarvestPlus, Nigeria, 2012

invested. Once a particular micronutrient is bred into a crop line, the trait remains. This makes the process of biofortification, over time, sustainable and cost-effective.

A very simple cost comparison between supplementation, fortification and biofortification was done by HarvestPlus researchers. They found that one year of vitamin A supplementation for 37.5 million pre-school children in Bangladesh, India and Pakistan can be bought for US\$75 million. The same amount can buy enough iron fortification for one year for the same populations. It is also the cost of developing and disseminating iron and zinc-rich rice and

wheat varieties for South Asia, which will be available year after year without much investment.

Conclusions

Biofortification is an approach to preventing micronutrient deficiency that is sustainable and scalable: it now reaches more than 15 million people in initial focus countries in Africa and Asia. Cumulatively, more than 100 biofortified varieties across ten crops have been released in 30 countries, where second and third waves of even higher nutrient lines are being tested for future release. Candidate biofortified varieties across 12 crops are being evaluated for release in an additional 25 countries. The goal is to

reach 100 million people with biofortified nutritious foods by 2020 and one billion people with biofortified foods by 2030.

It is a nutrition-smart agricultural intervention supported by robust scientific evidence demonstrating that regular consumption of traditionally cooked biofortified food crops improves the nutritional status of the most vulnerable groups: rural and marginal-urban, poor women of child bearing age (pregnant or not) and children aged 0 to 24 months.

For more information, visit:
www.harvestplus.org/

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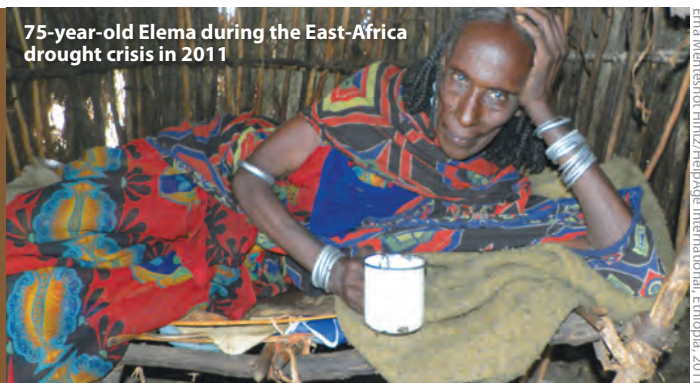
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Minimum Standards for Age and Disability Inclusion in Humanitarian Action

75-year-old Elema during the East-Africa drought crisis in 2011



The Minimum Standards for Age and Disability Inclusion in Humanitarian Action have been developed for use by all practitioners involved in humanitarian response, including staff and volunteers of local, national and international humanitarian agencies. The Standards are intended to inform the design, implementation, monitoring and evaluation of humanitarian programmes; to strengthen accountability to people with disabilities and older people; and to support advocacy, capacity-building and preparedness measures on age and disability across the humanitarian system.

The Sector Standards on Food Security and Nutrition have a set of Sector Specific Standards and Action Points which can be selected to address the specific context of the humanitarian response, based on the initial assessments. The following is an example of how the Minimum Standards can guide your response to include older people and older people with disability in a comprehensive response:

Nutrition Standard 1

- The nutritional status of older people and people with disabilities is systematically assessed and monitored;
- Nutritional assessments are used to trigger and inform emergency nutrition responses that include or target older people and people with disabilities.

Actions to Meet the Standard – a sample of points that are included in the Minimum Standards:

- Use sex-, age- and disability-disaggregated data to assess the nutritional status of adults and children with disabilities and older people;
- Use outreach programmes to identify and include those who cannot reach registration points;
- Ensure nutrition assessments are informed by food security assessments in order to identify and address factors affecting the nutritional status of people with disabilities and older people. Include these groups in strategies for the prevention of micronutrient deficiency.

This is a pilot document and feedback is welcome, contact Diana Hiscock, email: diana.hiscock@helpage.org or adcip@helpage.org

The Minimum Standards have been developed as part of the Age and Disability Capacity programme (ADCAP), which is funded by the UK Department for International Development (DFID) and the United States Agency for International Development (USAID).

www.helpage.org/what-we-do/emergencies/adcap-age-and-disability-capacity-building-programme/

To learn more, download the Minimum Standards for Age and Disability Inclusion in Humanitarian Action from www.helpage.org/download/56421daeb4eff

To access the webinar on Health and Nutrition in Humanitarian settings, please go to the Disaster Ready website disasterready.csod.com. Register for free to access the webinar and other content.

Regional humanitarian challenges in the Sahel

Summary of report¹



A family in their tent in Mali, displaced from their homes due to conflict

WFP/Jane Howard, Mali, 2012

Location: *The Sahel*

What we know: The Sahel is currently in complex crisis fuelled by conflict, climate change and weak governance.

What this article adds: A recent case study of regional humanitarian challenges in the Sahel, informed by visits to Mali, Niger and Senegal, identifies major shortcomings in the humanitarian system as currently organised. Competition rather than collaboration characterises the humanitarian/development relationship. Humanitarian architecture is complex, duplicative and bogged down in coordination. Conflict is the dominant view of the region by donors; increased security measures pose challenges to operations. Large aid agencies are increasingly not operational, with energies diverted to reporting and accountability to donors, rather than beneficiaries. National agencies are operationally significant but lack power within the aid dynamic. Solutions are available, but political will is currently lacking.

Despite impressive growth and institutionalisation, the humanitarian system is facing a crisis. According to a recent report on humanitarian challenges in the Sahel region, the humanitarian system risks being outpaced by new threats and vulnerabilities linked to conflict, technology and natural disasters. The authors assert that the system is struggling to adapt to the social and political changes spawned by globalisation, constrained by the way the humanitarian system is organised with a framework for decision-making that risks becoming obsolete.

Recent crises in Afghanistan, Somalia, Haiti, Sri Lanka and Pakistan as well as current emergencies – Syria, South Sudan, Central African Republic, among other less visible crises – raise questions about the very foundations of humanitarianism. The authors argue that unless urgent steps are taken, humanitarian action will lose its relevance as a global system for saving and protecting the lives of at-risk populations. The report identifies areas where, given the political will, immediate improvements could be introduced in order to make the humanitarian system more effective in responding to current crises and disasters.

As part of its analysis of the current humanitarian system and its strengths and weaknesses, the Feinstein International Center (FIC) at Tufts University has produced a series of case studies that analyse blockages and game

changers affecting humanitarian action in recent crises. This study focuses on the Sahel and is one of four case studies developed for the Planning from the Future study, conducted in collaboration with Kings College, London and the Humanitarian Policy Group at the Overseas Development Institute (ODI).

The Sahel

Until the early 2000s, the Sahel was on the margins of geopolitical interest and humanitarian action and debate. The African region stretches in a 4,000km band from Senegal on the west coast to Chad in the east, encompassing Senegal, the Gambia, Mauritania, Mali, Burkina Faso, Niger, Chad and Cameroon. The Sahel countries share a French colonial heritage (apart from the Gambia) and features of a common currency and lingua franca.

Today, the Sahel is centre stage because of a complex crisis that has potential ramifications far beyond the region. The situation is due to a set of interconnected factors, including:

- The emergence of conflicts, strong non-state armed and non-armed actors, transnational criminal networks, and a counter-terrorism agenda;
- The tense relationship between humanitarian action and development, which has fostered a competitive rather than collaborative environment among organisations operating in the region;
- The impact of climate change on livelihoods; and

- The weakness of governance across the region.

This report, based on field visits to Mali, Niger and Senegal, describes how these issues are playing out across the Sahel and discusses the implications for humanitarian action. It raises important questions for the future of humanitarian action in the Sahel and beyond. The authors introduce the history of the region and nature of the current crisis, with details on major stakeholders – an array of the state and non-state actors, including conflict actors and transnational criminal networks. The largest multilateral donors to the Sahel are the United States and the European Union, with the 2012 drought marking a sudden increase in humanitarian funding for the region.

Major findings, themes and lessons learned

Findings are organised around the concept of “game changers” (factors that emerged from the crisis or were relatively new, and for which the humanitarian community is ill-prepared to deal with), and “blockages” (either things that are blocking humanitarian action in a given context, including long-standing problems); some findings contain elements of both.

The main findings focus on the Sahel (and more generally, West Africa) as a relatively neglected and peripheral region of intervention for aid, compared to other global crises. This is reflected in smaller budgets and observed differences in professionalisation of humanitarian staff (the region is considered a “less prestigious” posting with limited circulation of staff outside the Francophone “pocket”).

Problems have tended to be viewed in developmental rather than humanitarian terms, with the chronic crisis perceived as a “failure” in development, thus lacking humanitarian ownership and innovation as seen in other regions. This fuels the uncomfortable coexistence between development and humanitarian action, whereby the Sahel’s main problems (food secu-

¹ Donini, Antonio and Scalettaris, Giulia. 2016. *Case Study: Regional Humanitarian Challenges in the Sahel. Planning from the Future, Component 2. The Contemporary Humanitarian Landscape: Malaise, Blockages and Game Changers*. Feinstein International Center. Medford: Tufts University. fic.tufts.edu/assets/Sahel-case-study-Final-09-05-16.pdf

ity, malnutrition and epidemics) can be framed in both terms.

The chronic nature of the situation makes it a complex humanitarian environment. The humanitarian situation is understood to be in constant expansion and polarisation, with local actors only playing a minimal role. Local non-governmental organisations (NGOs) are used to access insecure areas but not treated as “equals”. While international players raise issues of accountability and capability of local agencies, national NGOs voice frustrations regarding bureaucracy and challenges in accessing international humanitarian funds.

Large aid agencies are losing their “field craft” as they are increasingly not operational, with energies diverted to reporting and accountability to donors, rather than beneficiaries. Coordination and transaction costs are high,

since inter-agency dynamics absorb large amounts of human and financial resources. Official coordination mechanisms involve the UN Office for the Coordination of Humanitarian Affairs (OCHA), Inter-Agency Standing Committee (IASC)-mediated clusters, UNHCR (refugees) and a parallel ECHO (European Civil Protection and Humanitarian Aid Operations) coordination system; sub-groups/fora/working groups are proliferating partly in response to inadequacies in existing systems.

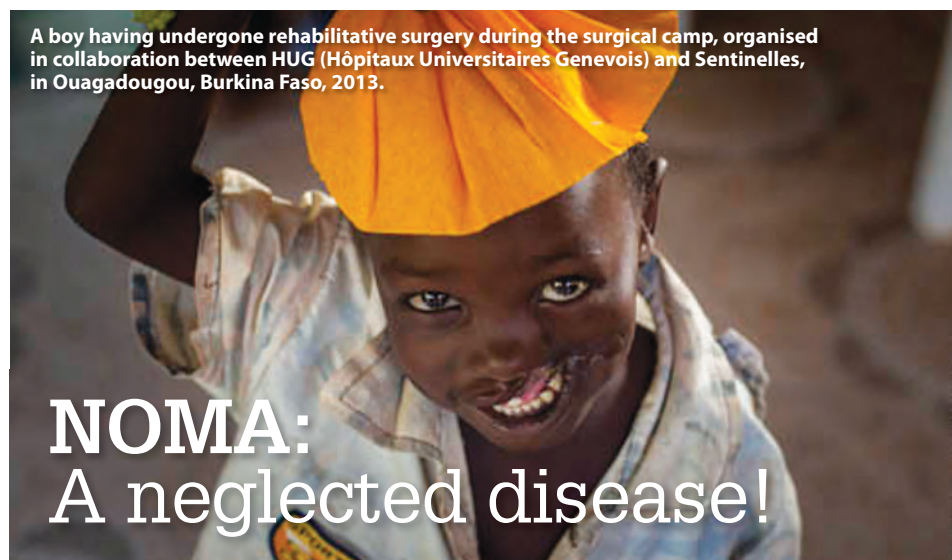
Key lessons include:

- The Sahel is rapidly changing, with conflict becoming a key lens through which the region is viewed by donors. The escalation in security measures will pose increasing challenges to humanitarian agencies;
- There are implications for humanitarian principles and staff security in the perceived

alignment with external political/military agendas;

- The humanitarian aid system has still not found its footing and is struggling to deal with the complexity and tensions surrounding the Sahel crisis;
- The appointment of a regional humanitarian coordinator has been an innovation but it is unclear if it has made the system any more effective; and
- The humanitarian architecture is complex, duplicative and bogged down in coordination.

The report concludes that solutions are available to make the system more effective, but political will is lacking. The humanitarian system in the Sahel, as elsewhere, is becoming more remote and functional to the needs of the main players, rather than the populations it purports to serve.



A boy having undergone rehabilitative surgery during the surgical camp, organised in collaboration between HUG (Hôpitaux Universitaires Genevois) and Sentinelles, in Ouagadougou, Burkina Faso, 2013.

Mylène Zizzo, 2013

The incidence of NOMA among children is estimated at 140,000 per year and the prevalence at 770,000 cases worldwide (2, 3). Lower estimates are 100,000 children per year who are affected by NOMA, of whom 20,000 survive (www.nonoma.org). However these figures are likely gross underestimates; NOMA is underreported since it occurs in remote areas, people are not eager to let the world know there is a disfigured member of the family, and the disease progresses rapidly to death. Most cases of NOMA (80%) occur in countries in the SAHEL belt, such as Chad, Nigeria, Niger, but also in Asia and South America. In the past, NOMA occurred in Europe too, where it was associated with poverty and the presence of other infectious diseases such as measles or tuberculosis.

The precise causes of NOMA are unknown, but the disease is thought to be related to immune dysfunction. Reduced immune function is in turn associated with poverty, the presence of other diseases (measles, malaria, pneumonia and HIV/AIDS (4)), malnutrition (5), poor hygiene and sanitation (no clean water, contact with animal waste), as well as lack of primary health care and health promoting activities like vaccination. Lack of oral hygiene is also a risk factor for NOMA; one of the early stages of NOMA is gingivitis and other infections in the mouth.

By GESNOMA, Winds of Hope, Sentinelles, and Médecins sans Frontières



NOMA (cancrum oris and fusospirochetal gangrene or Necrotising Ulcerative Stomatitis), disfigures children rapidly, if they survive. It is one of the most devastating and disfiguring human diseases worldwide and was designated a health priority by the WHO in 1994 (1). NOMA is still a neglected disease, and there is not much known about its causes, prevention and optimal treatment. Fortunately, with simple interventions, NOMA can be addressed and contained and people with NOMA can be cared for. Thus, this disease deserves more attention from healthcare workers, nutritionists, researchers and policy-makers. In this article, we explain NOMA, explore the relationship between NOMA and nutrition and suggest how health workers in nutrition programmes can be involved in its identification and

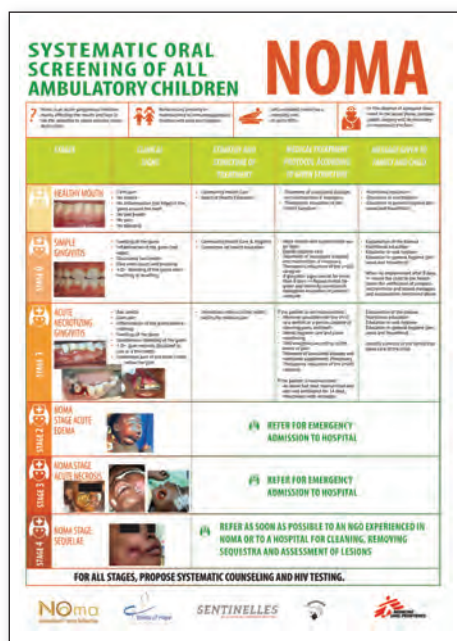
management. Two posters are included with the print edition of *Field Exchange*, one for an out-patient and one for an inpatient consulting room setting, in both English and French.

What is NOMA?

NOMA is a gangrene in the orofacial area. The course of the disease is very aggressive and fast. It starts as a gingivitis that develops into a gingival ulcer and/or necrotising gingivitis, spreading rapidly throughout the tissues of the mouth and face. The infection can result in necrosis of tissue and bone in the face which, combined with sepsis, is fatal in most patients. NOMA not only disfigures the patient but also causes dysfunction in eating and speaking, resulting in malnutrition and social isolation (2). If NOMA is untreated, 70-90% of patients will die.

Screening for gingivitis:

- Gums: redness, pain, bleeding
- Hyper salivation, drooling
- Bad breath
- Anorexia
- Gingival ulceration
- Facial swelling / oedema.
- Dry necrosis, loss of tissue, possible bone sequestrum



Treatment of NOMA

The early stages, such as simple gingivitis, should be treated with mouth washes of salted water and general oral hygiene. A complicated gingivitis (with necrosis, spontaneous gingival bleeding and pain) requires professional dental hygiene and follow up (if available). If dental hygiene and follow up cannot be achieved, antibiotics are needed. When there is a necrotising gingivitis/stomatitis with oedema of the corresponding facial region, antibiotics are mandatory. The later stages should be managed by an intense antibiotic regime in order to stop the spread of the infection and to avoid the deadly complications (such as septicaemia). Once the infection is over, and depending on the localisation of the NOMA, physiotherapy aimed to avoid complete trismus (jaws constriction) must be started for those patients developing this complication. In many cases, specialist reconstructive surgery is needed and can only be planned

once the scarring process is over and no earlier than one year after the acute NOMA. Treatment to improve function, counselling and actions to maintain dignity of the patient must always be present from the beginning of the lesion.

Simple gingivitis can be treated in an ambulatory therapeutic feeding centre (ATFC), the clinic and at home by rinsing with salted water for 14 days. In inpatient settings, such as an inpatient therapeutic feeding centre (ITFC) or hospital, mouth washes with 0.5% Betadine 4 times per day for 5 days (maximum) can also be used. Then, application of a solution consisting of 2 parts 1.4% bicarbonates at to 1 part nystatine 4 times per day for at least 10 days, or possibly over the total duration of the hospitalisation, can be applied with the aid of a compress rolled up on a tongue compressor (the caregiver can be taught to do this). In the case of necrotising gingivitis, the above local treatment should be completed with antibiotics (amoxicillin-clavulanate combination or amoxicillin plus metronidazole).

The treatment should be complemented by active nutrition support (e.g. supplementation with lipid nutrition supplements (LNS) or therapeutic foods where severely malnourished), treatment of any other existing infections, and updating of vaccination status. Prompt recognition of the early stage of NOMA (gingivitis) and treatment at this stage can prevent subsequent tissue destruction and disfigurement. This implies early recognition and active screening for NOMA.

Malnutrition and NOMA

Malnutrition (moderate and severe) is the most important risk factor for NOMA (5). Therefore prevention of malnutrition (along with treating underlying diseases, improving vaccination coverage and HIV testing) is an important step in the prevention of NOMA. This means that all moderately or severely malnourished individuals should be screened for signs of gingivitis. In addition, every patient in inpatient and outpatient nutrition treatment centres should be screened for gingivitis (simple and severe) and other mouth abnormalities. Once the NOMA infection is treated, many patients still have severe lesions in the mouth and face that can hamper eating, chewing, swallowing, talking, and sometimes even vision or breathing. Good nutritional support and guidance, with possible physiotherapy, can help to return to an acceptable nutritional status. Prior to any surgery, the lesion must no longer be active and the patient should be well nourished; close monitoring of their nutrient status and supplementary feeding is often necessary before surgery can be performed.

Active screening in feeding programme

Feeding programmes treating moderate and severe malnutrition have a concentration of children at risk for NOMA and are therefore excellent places to target these children; they can play an important role in controlling

NOMA in an area. Activities to include in a feeding centre are:

- Systematic screening of patients on admission for gingivitis
- Nutritional rehabilitation
- Vaccination
- Systematic HIV counselling and testing
- Screening of siblings and mothers,
- Improvement of water quality, sanitation and hygiene
- Education of patients and caretakers on mouth hygiene and NOMA
- Reporting of cases of NOMA in the village by caretakers
- Referral of NOMA patients to specialised institutes (where available)

Accessing guidance and support

Sentinelles, Winds of Hope, GESNOMA (all members of the International NoNoma Federation) and Médecins Sans Frontières (MSF) have created a working group to collaboratively develop several kinds of support:

- Posters for the consultation room in French and English for inpatient (hospital, ITFC) and outpatient facilities (outpatient medical clinic and outpatient/ambulatory therapeutic feeding centres (ATFC)) (included in this edition of *Field Exchange*)
- Guidelines on treatment of NOMA
- Support to specialised centers for surgery
- Background information
- Guidelines on management of moderate and severe acute malnutrition
- Research

Nonoma (FR): www.nonoma.org

Winds of hope (EN, FR, GE): www.windsofhope.org

Sentinelles (FR, EN): www.sentinelles.org

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www.righttofood.org/wp-content/uploads/2012/09/A-HRC-19-73.pdf

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Improving care of people with NCDs in humanitarian settings

By Emily Mates, ENN Technical Director (meeting attendee)



Treating non-communicable diseases in Jordan

There is an increasing burden of non-communicable diseases (NCDs) among people displaced and otherwise affected by humanitarian crises. Humanitarian organisations are facing new challenges when confronting them as there are many uncertainties regarding the best strategies to implement NCD care in these crisis-affected settings.

A recent (2nd September 2016) one-day symposium on the topic was hosted by the London School of Hygiene and Tropical Medicine (LSHTM) Centre for NCDs and Centre for Health and Social Change (ECOHST) and Médecins Sans Frontières (MSF). It brought together speakers from academic, development and humanitarian organisations to address some key issues faced when working to improve the care of patients with NCDs. Presenting agencies included MSF, International Medical Corps, LSHTM, NCD Alliance, United Nations High Commissioner for Refugees (UNHCR), United Nations Relief and Works Agency for Palestine (UNRWA), International Rescue Committee, International Committee of the Red Cross and the University of Geneva.

The burden of NCDs in the Middle East region is increasing, particularly cardiovascular disease (CVD), respiratory disease, diabetes and cancers, with an estimated 1.7 million deaths per year; diabetes rates are amongst the highest in the world. It is very difficult to get people to change behaviour even in the developed world; in crisis situations, this becomes ever more difficult. Mental health issues are often an acute problem amongst refugees. Particular

problems associated with NCDs in humanitarian settings include:

- Varying burdens, depending on the context
- Impact on health care infrastructure of host nations; there are additional problems when host nations have largely private health care systems
- There are currently multiple protocols and guidelines in existence, depending on the context
- Insufficient mental health services
- As in non-crisis situations, people generally prefer medication to lifestyle change.

Some lessons can be drawn from the global response to the HIV pandemic, although with HIV there is a single cause with high burden, which makes it easier for researchers and practitioners to activate around it. The situation with NCDs is more complex, as it involves a heterogeneous group of diseases with no single cause and variable burden, depending on context. A key consideration is the mortality risk when treatment is interrupted. For example with CVD and statin treatment, if treatment is interrupted the results are not too serious; with type 1 diabetes, mortality risk is extremely high with treatment interruptions.

Regarding nutrition, obesity was raised as a causal factor but further nutrition considerations regarding NCDs (prevention or management) in humanitarian settings were not discussed.

Main summary points included:

- We must improve our understanding of the needs, which will vary by context, to respond to the challenges effectively – traditional

humanitarian systems do not currently cater well for assessment of NCD needs.

- Lessons can be applied from other chronic disease programmes such as HIV/AIDS.
- Standardised guidelines, tools and training are needed on how to deal with NCDs in emergency settings.
- Cohort monitoring is required to identify gaps in service provision and evaluate services.
- Service must be patient centred, with trained and incentivised health workers.
- Institutional structures and resources supportive of integration for chronic disease management alongside traditional humanitarian response are required.
- Recognising the mortality consequences of treatment interruptions, it was suggested that a matrix is needed for use at organisational level regarding what problems exist and how acute they are, to ensure continued treatment.
- More research is needed: two systematic reviews on effectiveness of NCD interventions and integration of HIV/NCDs presented at the meeting were inconclusive due to lack of evidence.

Video recordings of all presentations are available at: www.msf.org.uk/event/symposium-improving-care-of-people-with-non-communicable-diseases-in-humanitarian-settings

This symposium is linked to a thematic series on NCDs in humanitarian crises being published in the journal 'Conflict and Health'. See: www.conflictandhealth.biomedcentral.com

eLearning module on improving nutrition through agriculture and food systems

The new eLearning module 'Improving Nutrition through Agriculture and Food Systems' is now online. It is designed to assist professionals from any fields related to food security, agriculture and food systems that are involved in designing and implementing nutrition-sensitive programmes, investments and policies. The module uses a scenario-based and experiential learning approach to illustrate the linkages between agriculture, food systems and nutrition. It provides a series of examples of nutrition-sensitive policies and interventions and gives an overview of

global and regional initiatives and commitments related to nutrition on which learners can build to integrate nutrition in their work.

This module was developed by FAO's Nutrition and Food Systems Division and Partnerships, Advocacy and Capacity Development Division, in collaboration with the World Bank and European Union, and with technical inputs from many partners.

It is available in the FAO e-learning page: www.fao.org/elearning/#/elc/en/course/NFS

Other related e-learning modules are: *Nutrition, Food Security and Livelihoods: Basic concepts*. A short course on the basics of nutrition. www.fao.org/elearning/#/elc/en/course/NFSLBC

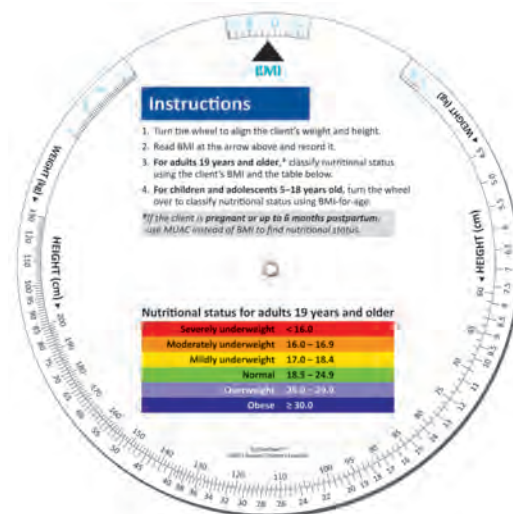
Agreeing on causes of malnutrition for joint action. A key resource to improve the understanding of the multi-sectoral causes of malnutrition and support integrated nutrition planning. www.fao.org/elearning/#/elc/en/course/ACMJA

FANTA's Body Mass Index (BMI) Wheel

Determining BMI is a way for health workers to identify malnutrition in children over 5 years of age, adolescents, and non-pregnant, non-lactating adults. BMI is calculated as body mass divided by the square of the body height (kg/m²). In 2014, FANTA and the Boston Children's Hospital created the BMI Wheel for health care workers in developing countries to quickly calculate BMI and BMI-for-age, as well as determine a client's nutritional status using a single time-saving tool. The FANTA Project is pleased to announce that the BMI Wheel is now available.

The design files for the BMI wheel are available in English, Spanish, and Portuguese for organisations interested in printing the wheel for their own use. For details on how to print and use the tool, including an informational video, visit: www.fantaproject.org/tools/body-mass-index-bmi-wheel

Any questions or experiences on using the tool should be sent to: fantamail@fhi360.org



Launch of BabyWASH Coalition

The newly launched BabyWASH Coalition is a five-year initiative comprising organisations across civil society, United Nations (UN) organisations, funders, academics and the private sector. It is focused on increasing essential integration between programming, policy-making and funding in the areas of water, sanitation and hygiene (WASH); early childhood development (ECD); nutrition; and maternal newborn and child health (MNCH), to improve child well-being in the first 1000 days.

It is built on the premise that half a million children and 30,000 mothers annually could survive and thrive through better and more integrated approaches to maternal and young child health. WASH is often missing from nutrition, ECD, and MNCH programming, despite a growing evidence base on the need for linkages. There are many policy, attitudinal, and funding barriers to integration. The coalition aims to leverage its collective strengths to break down these barriers. The coalition is a direct response to the Sustainable Development Goals (SDGs) call for increased partnerships and intersectoral collaborations, and is in support of the Every Woman Every Children Global Strategy, which has a newly enhanced focus on multi-sector actions.

Main coalition objectives

1) Develop and disseminate lessons and guidance for programme integration

Besides being a source of information and case studies of successful integration, the

Coalition will create a toolkit for programme implementers on how to successfully integrate BabyWASH interventions into their programming and work collaboratively with other sectors and organisations.

2) Define integration metrics

The Coalition will use current research and success stories to define the key components and metrics of beneficial integration. Where appropriate, the Coalition will assist in planning pilot programmes to validate metrics.

3) Advocate for stronger focus on integrated care in the first 1,000 days of life

The Coalition will use case studies and evidence to advocate for more integration between sectors. Funders and policy-makers will be targeted to minimise current barriers to integration.

Who can be involved?

The Coalition is open to all organisations interested in promoting improved maternal, newborn and young child health outcomes through increased sector integration. The Coalition is especially interested in finding national champions who can advocate for or implement BabyWASH interventions at a local level.

Interested organisations can join the Coalition as a Community of Practice (CoP) member or as a dedicated member of one of the workstreams. CoP members commit to providing information and case studies for the monthly resource newsletter, staying up to date on



BabyWASH news, and being an advocate for integration in their circles of influence. They will also be asked to review materials created by each of the workstreams. Organisations involved in one of the workstreams will meet monthly to move Coalition deliverables forward and work in a dedicated team on advocacy, programme guidance, and metrics for integration.

For more information, or to join the Coalition, visit www.babywashcoalition.org or contact Peter Hynes, BabyWASH Coalition Coordinator, email: admin@babywashcoalition.org or follow: #BabyWASH



En-net update

By Tamsin Walters, en-net moderator

Over the past four months (1st July to 31st October), 88 questions have been posted on en-net, generating 228 responses. Forty-two vacancy announcements have been posted, which have accumulated almost 12,000 views on the website; and eight upcoming trainings.

en-net has increasingly seen posts alerting readers to new research and guidance in areas that have received much attention on the site, such as coverage assessment www.en-net.org/forum/16.aspx and WHO updates on HIV and infant feeding www.en-net.org/question/2579.aspx which is a welcome development, assisting people to access research and evidence-based information. In addition, there have been several posts recently to encourage readers to engage in online consultations and experience-sharing by researchers and those developing guidelines. These include Sphere Handbook consultation, updated guidance on Infant feeding, and contributions to research on "Understanding the contextual factors enabling evidence-based decision making in disasters: Organisational contexts and other disaster related contexts". The latter is still open for inputs here, www.en-net.org/question/2697.aspx

In the Scaling Up Nutrition (SUN) forum area there has been a call for experiences on engaging nutrition champions for a new guide to be published by the Institute of Development Studies (IDS) and the SUN Movement Secretariat. Contributions have been shared by individual practitioners, SUN Focal Points, government ministers and civil society alliance conveners. Findings so far include:

The Prime Minister galvanised Namibia into action after a review illustrated that the country was facing a major challenge in reducing maternal deaths and infant mortality and making slow progress towards its Millennium Development Goals (MDGs). A survey was then conducted which clearly showed the links between the high rates of anaemia in pregnant women and stunting in children and these poor outcomes. It was against this background that the Namibia Alliance for Improved Nutrition (NAFIN) was born. NAFIN is multi-sectoral and multi-stakeholder. Its mission is to provide evidence-based information to policymakers on the state of nutrition in Namibia; promote social mobilisation in favour of balanced diets; promote breastfeeding; build awareness among pregnant mothers about the need to visit antenatal clinics; promote public hygiene such as good sanitation and hand washing.

The SUN Civil Society Alliance Pakistan (SUNCSPA, Pak) organised sensitisation sessions

of Parliamentarians in all provinces and at Federal level to engage them to play an important role in implementation of Inter-sectoral Nutrition Strategies and enactment/enforcement of relevant legislation, such as Protection and Promotion of Breastfeeding laws, mandatory food fortification laws, etc. Parliamentarians can also help increase budgetary allocations for nutrition specific and nutrition sensitive interventions. They found key messages that work well are:

- (1) The current malnutrition crisis in Pakistan has been estimated to cost the economy 2-3% of Gross Domestic Product (GDP) per year; Pakistan cannot afford to sustain this drain on the economy.
- (2) If prioritised, malnutrition can be ended in a generation in Pakistan! Addressing malnutrition is one of the best investments Pakistan can make in its future.
- (3) Improving nutrition is transformational - families become healthier, wealthier and better educated, because
 - Children who are malnourished learn less at school, and earn less when they grow up.
 - Iron and iodine deficiency in childhood reduces IQ by up to 25 and 13 points respectively.
 - Malnutrition makes children more likely to acquire communicable diseases like measles and also develop complications. Malnutrition also reduces the effectiveness of certain vaccinations.

The SUN CSA, Pak is now developing policy briefs and provincial scorecards to equip them with ready to reference information required for policy making and planning.

The Sierra Leone Alliance Against Hunger and Malnutrition is a civil society advocacy non-governmental organisation and an alliance of over 150 networks. They came together as an alliance after persistent reports identifying malnutrition as one of the major causes for the high maternal and infant mortality in the country, one of the key issues responsible for Sierra Leone's low position in the Human Development Index.

To enhance government commitment to nutrition, the alliance is currently leading the efforts to include nutrition and food security issues in the National Constitution in the current constitutional review process. The effort has already yielded fruit: under Protection of Socio-economic Rights, to be free from hunger and to have food of acceptable quality, has been included. The alliance is currently hosting, on behalf of Sierra Leone, the Ecosystem Based

Adaptation for Food Security Assembly which is a Pan African institution, and thereby encouraging other nutrition activists to include climate change issues in their nutrition activities.

Follow the discussion and add your contribution at www.en-net.org/question/2700.aspx

Finally, there have been several calls on en-net for access to more nutrition materials in French, Spanish, Russian and Portuguese. This ranges from translated guidelines to SMART survey reports. The dearth of available literature in languages other than English is a significant issue. If you have links or materials to share, please do so, here www.en-net.org/question/2583.aspx or www.en-net.org/question/2705.aspx or contact post@en-net.org. en-net has a mirror French site, launched earlier this year, www.fr.en-net.org. We very much welcome feedback on the quality of translations on this site and suggestions to make it increasingly accessible and useful to French speakers. All feedback is welcome to post@en-net.org.

To join any discussion on en-net, share your experience or post a question, visit www.en-net.org.uk

Contributions

Nahas Angula, Muhammad Irshad Danish, Hasane, Edward Jusu, Dr. Bonnix Kayabu, Regine Kopplow, Scaling Up Nutrition/Transform Nutrition Moderator.



A child awaits her check-up at a community clinic in Nyankpala in the Northern Region of Ghana

WFP/Nyanti Quarmyne

Open Data Kit Software to conduct nutrition surveys: Field experiences from Northern Kenya

By Daniel Muhinja, Sisay Sinamo, Lydia Ndungu and Cynthia Nyakwama



Daniel Muhinja is National Nutrition Specialist with World Vision (WV) Kenya, providing technical leadership to nutrition programming. He has over ten years' experience in the design, management, monitoring and documentation of nutrition programmes.



Dr Sisay Sinamo MPH, MD is currently Nutrition Advisor for WV International East Africa Region, supporting nine countries. He has worked in developmental and emergency nutrition programming for the past 16 years.



Lydia Ndungu is Nutrition Programme Officer with WV Kenya and provides nutrition technical capacity-building, mentoring, resource mobilisation, nutrition advocacy, research,

documentation, programme design, monitoring and evaluation.



Cynthia Nyakwama is Health Programme Officer with WV Kenya. She has over 10 years' experience in developing and managing national programmes and projects for health on malaria and

HIV/AIDS with international non-governmental organisations.

The authors acknowledge the Ministry of Health, International Rescue Committee, Save the Children and Islamic Relief. The project was funded by the Department for International Development (UKaid), World Vision UK and World Vision Canada. Thanks also to Colleen Emary, Senior Emergency Nutrition Advisor, World Vision International, for assistance in the development of this article.

Location: *Kenya*

What we know: Manual survey data collection and analysis is resource-intensive, with risk of errors.

What this article adds: A free, open-source mobile data collection package (Open Data Kit) (ODK) was successfully used by World Vision Kenya to conduct a SMART survey. Compared to manual data collection, it proved cheaper (less staff), quicker (instant data upload ready for analysis), less prone to error (immediate data checks possible) and abuse (GPS checks on random sampling) and more environmentally friendly (printed questionnaires not needed). Data aggregation (hosted on cloud server or internal servers) allows for further future analysis. Electricity/power packs (for charging), mobile internet (for data upload) and smartphones are needed but were not a barrier. Minor suggestions are made to the developers to improve usability.

Background

Nutrition programmes require high quality and timely data for appropriate decision-making. In the past, nutrition programmes used time-consuming manual processes for data collection and analysis. Open Data Kit (ODK) is a free and open-source set of tools which helps organisations author, field and manage mobile data collection solutions

(see Box 1). Its core developers are researchers at the University of Washington's (UW) Department of Computer Science and Engineering and active members of Change, a multi-disciplinary group at UW exploring how technology can improve the lives of under-served populations around the world. WV is using ODK extensively for nutrition and health surveys across Asia and Africa;

Box 1 About ODK

Open Data Kit is an open-source set of tools that enables online generation of forms/questionnaires, data collection on mobile phones and submission to a central server which is downloaded during analysis. ODK is made up of three platforms:

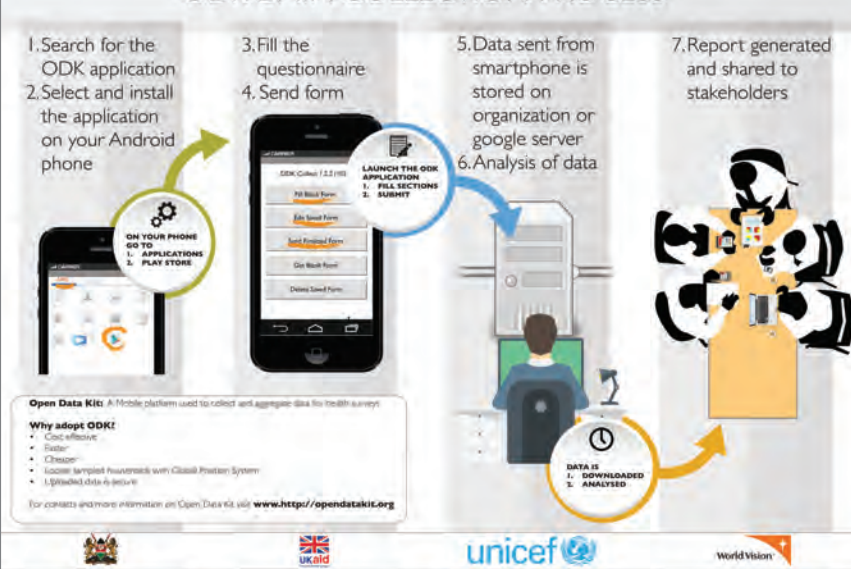
ODK Build: Enables users to create questionnaires using a drag-and-drop form designer or an Excel spreadsheet;

ODK Collect: Phone-based replacement for paper forms for data collection;

ODK Aggregate: Provides a ready to deploy online repository to store, view and export collected data.

Data collected using ODK may be stored by Google servers or organisational servers. The server is a safe repository for data collected (cloud), and can be used for future analysis by other internal parties, such as WV-support offices.

ODK DATA COLLECTION PROCESS





to date, 19 countries have been trained on ODK. World Vision Kenya introduced the concept of ODK for nutrition surveys conducted in Kenya; this article shares their experiences around this.

Methodology

World Vision conducted a three-day LQAS (Lot Quality Assurance Sampling) survey training using ODK for 12 staff from a consortium of four non-governmental organisations (NGOs) and equipped them with skills to create a survey tool, upload data and download it for analysis. This training led to the development of a Standardised Monitoring Assessment for Relief and Transition (SMART) survey generic tool by the nutrition sector in Kenya. Sixty enumerators and 20 team leaders in Turkana County and 30 enumerators and ten team leaders in Wajir were trained for four days to conduct SMART surveys. During the fourth day, the survey teams completed a pilot exercise using smartphones. This was followed by six days of data collection in the field.

Table 1 compares manual survey requirements against using ODK. Use of ODK saves on printing or photocopying bulky questionnaires and transporting them during data collection to central data entry centre. It reduces the number of staff needed to collect data, as no data entry staff are required (data is collected using the smartphones in the field), and it saves on time needed to access data that has been collected. ODK improves

data quality by using a Geographic Information System to verify randomness of the data collected in the clusters (Figure 1) and by using skip logic, which ensures all questions are answered. Data collected is easily accessed and is stored in a server, hence it cannot be manipulated; WV Kenya used Google servers to store data and did not encounter any challenges. Use of smartphones in two surveys saved approximately US\$8,352 compared to paper-based surveys. One survey of 25-35 clusters requires one set of six smartphones, which cost about US\$3,180, and which are used for subsequent surveys.

Lessons learned

Developing the survey tool using Microsoft Excel is more user-friendly, easier and faster than using online ODK build function. Since Excel is offline, it is easier to work with; e.g. changes can be made that are then uploaded.

Power conservation, internet connectivity and mobile network coverage influence the time to upload survey data. To enable the smartphones to keep power longer, 'app lock' is used to lock some applications, which reduces power wastage. Back-up power banks of about 5,200mAH were purchased by World Vision to address the challenge of some smartphones being drained of power during data collection. These power banks are able to charge a smartphone twice in a day. It is also essential to map out availability of mobile network or internet so that the survey teams can upload data daily. Survey teams were provided with data bundles to allow data upload while in the field; bulk 300MB costs about US\$10 and is shared among teams.

Use of smartphones is not a substitute for survey team supervision, which is key during data collection to provide support and ensure survey protocols are followed.

Making survey supervisors accountable for smartphones and consistent use of one smartphone per team reduces loss and mismanagement of smartphones. To ensure responsibility and care for the equipment, supervisors signed a

form accepting that the smartphone was in their custody, that they would take care of it and be responsible in case of loss.

Plausibility checks were done on a daily basis and data analysis for anthropometry was done easily on downloading the data. The field survey teams uploaded survey data daily. The survey manager would download the data and conduct plausibility checks, relaying any data quality issues to the team supervisors to ensure subsequent data was of better quality.

Global Positioning System (GPS) improves the quality of data by locating the sampled household. Collection of GPS information enables mapping of data during the data collection process to show randomness of the data. This protects against the risk that a data collection team could falsely complete the questionnaires.

Recommendations to the developers are to increase the cloud size to accommodate more data sets, especially for organisations conducting many surveys, without charging fees for cloud storage. In addition, it is difficult set up questions normally in tabular format where each column requires different types of ODK responses. For example, for questions on utilise "add group", the ODK output is normally a link that requires additional publication; hence more time is needed to organise the data before it is transferred to another software program for analysis.

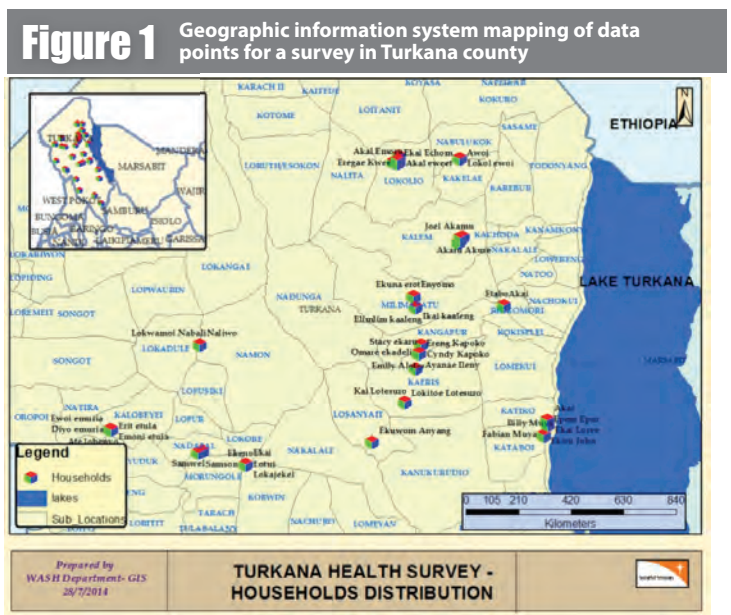
Conclusion

ODK has proved to be a good platform for faster, cost-saving collection and aggregation of nutrition survey data. World Vision's experience with ODK has been shared with other partners; the Nutrition Information Working Group in Kenya has embraced the platform and supports its use. The positive Kenya experience reflects World Vision's positive experiences in other countries.

For more information, contact Daniel Muhinja. Email: daniel_muhinja@wvi.org

Access ODK at: opendatakit.org

Survey aspect	Manual	With ODK
Data clerks	Required	Not required
Printing and photocopying questionnaires	Required	Not required
Questionnaire transportation	Required	Not required since data is uploaded on servers
Time taken to complete questionnaire	40-60 minutes (depending on size of questionnaire)	15-25 minutes
Data access	Up to several days to complete entry	Immediately uploaded
Data quality	Compromised at times	Improved – GPS tracking, no omissions and use of skip mode. Pictures taken in real time (for example, oedema checks)
Environment	Excessive paper waste	Environmentally friendly
Data	Can be manipulated	Secure and cannot be manipulated
Number of people per team	Minimum of four	Two is sufficient
Mobile connection	Does not require mobile or internet	Requires mobile or internet to send data to central servers
Electricity	Not required (questionnaire is photocopied in advance)	Requires electricity to charge smartphones as survey progresses

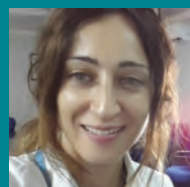


Source: World Vision Kenya



WHO emergency nutrition response in South Sudan

By Marina Adrianopoli and Allan Mpairwe



Marina Adrianopoli has been supporting WHO in South Sudan as Emergency Nutrition Focal Point since 2014. She has over 10 years' experience in advising on and implementing nutrition emergency response, policy-making processes and country-level programmes focusing on public health nutrition and food and nutrition security in different emergency and development contexts in East Africa, Central Asia and Eastern Europe.



Dr Allan Mpairwe is the Programme Manager for Health Security and Emergencies for the WHO Country Office in South Sudan. He has over 15 years' experience in implementing emergency health services in resource-limited settings and has supported emergency response operations in South Sudan for the last seven years. He was instrumental in the initiation and introduction of the new kit for management of children with SAM with medical complications in South Sudan.

The authors gratefully acknowledge Dr Usman Abdulmumini, WHO Representative in South Sudan, and colleagues from the Country Office in Juba, Magda Armah, Health Cluster coordinator, and Sylvain Denaire, Operation Officer, for playing a crucial role in supporting the implementation process at the national level. Thanks also to Havaskhon Abdulatipova, Henry Lagu and the staff of the WHO Juba Logistics Unit, who provided logistics support. Deep appreciation is expressed to Dr Adelheid Onyango, WHO AFRO Regional Advisor for Nutrition, Sophie Laroche, WHO HQ Essential Medicines, and colleagues at WHO Headquarters Department of Nutrition for Health and Development for their technical guidance, advice and continued support.

A poster sharing these experiences was presented at the World Nutrition Congress, Cape Town, South Africa, in September 2016. *Improving strategies for inpatient management of severe acute malnutrition and medical complications in children: A new WHO medical module distributed in South Sudan as innovative WHO Emergency Response on Nutrition.* Marina Adrianopoli, Allan Mpairwe and Sophie Laroche.

Location: South Sudan

What we know: Management of SAM children with medical complications is critical; communicable disease burden can rise in emergencies, increasing caseload and adding strain to existing health services, including key medicines supply and management.

What this article adds: Throughout the heightened emergency phase in South Sudan from 2014 to 2016, WHO intensified support to nutrition programmes with increasing focus on inpatient management of medically complicated severe acute malnutrition (SAM). A SAM-specific medicines kit was devised and introduced in June 2016, along with a comprehensive capacity-building package and consistent M&E tools, in line with existing WHO Global Guidelines and national information systems of the health and nutrition sectors. Kits were distributed to one third of functioning stabilisation centres before the latest escalation in violence disrupted services and monitoring. This initiative reflects WHO's operational role in nutrition programming in emergencies.

Context

Current crisis

South Sudan, the world's newest nation, has chronic vulnerabilities and is faced with multiple crises alongside historical marginalisation, acute insecurity, economic decline, disease and lack of access to services, infrastructure and food. The armed conflict in South Sudan has caused a major public health crisis since December 2013, disrupting essential primary and secondary healthcare services and infrastructure. Since then, despite diminishing intensity of the armed violence and increased humanitarian access in the most-affected areas, the conflict has spread to new areas that were previously stable, causing further displacement and damage to livelihoods. In July 2016, the country was already facing rising food insecurity (due to deepening economic crisis, unresolved tensions and depleted food stocks from limited household production) and critical malnutrition levels, when renewed and severe conflict broke out. This has sparked a new wave of mass displacement and has been devastating for civilians; health and nutrition facilities have been attacked, damaged and looted.

Prior to the July 2016 crisis, 4.42 million people were estimated to be in need of emergency healthcare; an estimated 4.7 million people are now in need of health assistance. The conflict has compounded an already dire health situation, documented by appalling health indicators, including the following mortality rates: maternal (2,054/100,000 live births); neonatal (43/1,000); infant (83/1,000); and under-fives (106/1,000).

The current prevalence of acute malnutrition in South Sudan is unprecedented. Global acute malnutrition (GAM) rates now exceed emergency thresholds of 15% in all states except Central Equatorial and Lakes. An estimated 5.1 million people are classified as severely food and nutritionally insecure. The GAM level in Northern Bahr

el Ghazal, one of the 10 former states of South Sudan before reorganisation in 2015, has hit the catastrophic level of 33.3%, indicating that one in every three children aged 6 to 59 months is acutely malnourished. In Western Bahr el Ghazal, GAM prevalence is now 20.6%, a nearly two and a half-fold increase in malnutrition in the last six months (8.5%, Dec 2015). Food insecurity is at critical levels in Northern Bahr el Ghazal, Warrap, Western Bahr el Ghazal, Upper Nile, and Lakes Region¹.

WHO role in South Sudan

Less than 40 per cent of the population has access to basic health and humanitarian services, and more than one third is in urgent need of food, agriculture and nutrition assistance. The WHO Country Office (WCO) in South Sudan provides basic healthcare in line with the WHO/AFRO transformation agenda² and Universal Health Coverage principles. Adequate and timely health humanitarian response and surveillance are effected through coordination with partners, addressing inequality in the delivery of priority health services across the country by targeting the most under-served populations. As Health Cluster lead agency, WHO works to ensure a functioning health sector coordinating mechanism involving UN agencies, partners, health authorities, donors and community members, and provides up-to-date information on country health situation and needs, including regular situation reports and bulletins³.

Under the Health Security and Emergencies operations, emergency nutrition is a strategic sector for WHO in South Sudan. Since the onset of the crisis in early 2014, WHO has provided technical and strategic guidance to the nutrition humanitarian

¹ IPC analysis 2016.

² www.afro.who.int/en/rdo/transformation-agenda.html

³ The work of WHO in South Sudan, 2015. *Working towards better health outcomes for the people of South Sudan.*

community and Ministry of Health (MoH) during the level 3 emergency. It has effectively supported review of strategic plans, policies, guidelines and criteria, and provided operational guidance on nutrition, through close collaboration with the MoH and partners. WHO is also actively engaged in intensifying timely sharing of nutrition information to better plan the response, as well as strengthening linkages and integration between health and nutrition.

This article documents WHO-led developments and progress around the treatment of complicated SAM in South Sudan.

Identified gap: Challenges in management of complicated SAM

According to Nutrition Cluster (NC) projections, in 2016 nearly 690,000 children under five years of age are expected to be acutely malnourished, of whom more than 230,000 will be severely malnourished. The burden of SAM children with medical complications is significant and estimated at up to 10% of the total SAM caseload (approximately 6% in 2015)⁴. Figure 1 reflects the admissions trend of malnourished children with medical complications at a stabilisation centre (SC) through 2015. Medical complications of SAM include: severe oedema; poor appetite including inability to suckle breastmilk effectively; and one or more Integrated Management of Childhood Illness (IMCI) danger signs⁵. Children presenting these conditions should be treated as inpatients in SCs, where clinical and nutrition care is provided. However, the lack of basic medical supplies drastically reduces the capacity to deliver effective and immediate response.

The most common morbidities amongst internally displaced persons (IDPs) in South Sudan are acute respiratory infection (ARI), acute bloody diarrhoea, and malaria (see Table 1); the most

common causes of death are malaria, followed by ARIs, and acute watery diarrhoea. Communicable diseases remain a concern throughout the country due to poor sanitation, shortage of safe drinking water, crowded living conditions, malnutrition, and poor immunity. There has been a notable upsurge in the scale and frequency of outbreaks of epidemic-prone diseases, especially in displacement sites where malnutrition and poor immunity render young children and pregnant women particularly vulnerable. A major cholera outbreak was reported in the second quarter of 2016 and is ongoing.

As of September 2015, some 55% of the health facilities in Unity State, Upper Nile State and Jonglei were no longer functioning. Stock-outs of essential medicines exacerbate the critical situation⁷. The conflict hampers access to and delivery of humanitarian assistance and has already increased the operational costs of implementing the humanitarian response. This is exacerbated by the very fragile health systems (lack of skilled staff, supplies and equipment, leadership, functioning facilities, etc.) at all levels. Most of the health facilities in Juba and affected states are almost non-functional, as health personnel fail to report for duty due to the prevailing insecurity⁸.

SCs are usually set up in hospitals or in Primary Health Care Centres (PHCCs), which are normally situated at Payam headquarters. They provide referral services as well as laboratory services for diagnosis, maternity and inpatient care. Each PHCC is expected to serve a catchment area of around 50,000 people. Drugs used in the SC are part of the hospital or PHCC package; therefore SCs rely on hospital and PHCC stock and use medicines that are also administered to sick non-SAM children who present. As a result of service integration, procurement and budgeting exclusively for SCs' stock of medicines is not common practice. Since they are embedded in static health facilities, SCs are also more exposed to closure in times of insecurity and displacement compared to outreach and outpatient mobile nutrition services.

WHO response

An improved inpatient care component of CMAM in South Sudan called for measures to address critical drugs shortage through timely procurement of essential medicines, ensuring coverage countrywide including conflict-affected areas and in terms of protection of civilians (PoC). Additional actions such as training were required to develop

and reinforce the capacity of medical teams managing patients with SAM with medical conditions. In this challenging context, WHO South Sudan has identified the provision of a medical kit for SCs and the related capacity-building package and guidelines as a comprehensive strategy to support SCs managing SAM children with medical complications (MSAM/MC).

The innovative procurement strategy shaped by WHO in South Sudan entails:

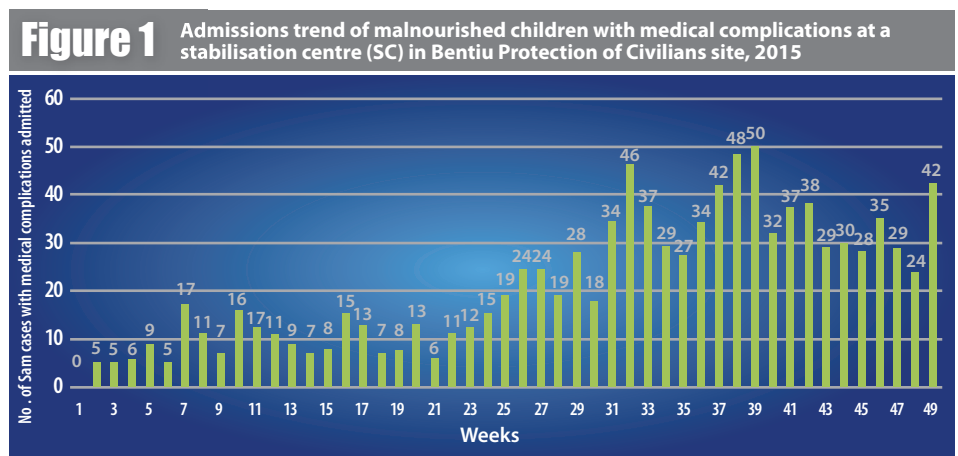
- Design and technical development of an innovative kit (see Box 1), which has been distributed in South Sudan and has been available in the online WHO catalogue since April 2016. South Sudan was the first country in the world to introduce the medical kit in June 2016;
- Standardisation of the set of medicines needed in SCs, aligned to South Sudan national medicine usage and taking into consideration quality, safety and efficacy of medicines supplied;
- Fast track procurement, involving supply of standard, pre-packed kits ready to meet priority health needs in an emergency, agile supply chain management and strategic sourcing of SC drugs to support positioning of supplies;
- The inpatient care component of the Integrated Management of Acute Malnutrition (IMAM) national guidelines will be updated, aligned with the Hospital Care of Children Pocket Book 2013 (reference guidelines in SCs);
- Quality assurance, as all drugs are obtained from reliable sources; and
- Integrated feedback mechanism (report), so that the service can be continuously improved in response to feedback on delivery.

This strategy enables MoH and partners operating SCs to be autonomous in providing timely treatment. It also provides a stopgap measure, offering relief for hospital stocks of medicines, which currently are not procured and managed specifically for children with SAM/MC.

Training

To provide guidance on medicine usage and support partners in delivering refresher training to staff working in SCs, WCO South Sudan has developed a context-specific, capacity-building package on inpatient management of SAM focused on medical conditions. Building on the WHO Guidelines and training for the inpatient treatment of severely malnourished children⁹, the package has been developed by WHO Emergency Nutrition South Sudan, with the support of implementing partners and WHO AFRO Regional Office, and cleared by MoH, Republic of South Sudan.

No	Disease	Cumulative cases 2015	Cases as % of total consultations
1	Malaria	276,913	28%
2	Acute respiratory infection (ARI)	187,673	19%
3	Watery diarrhoea	82,747	9%
4	Acute bloody diarrhoea	10,386	1%
5	Measles	598	0.002%



⁴ South Sudan Humanitarian Response Plan 2016.
⁵ www.who.int/maternal_child_adolescent/documents/IMCI_chartbooklet/en/
⁶ WHO South Sudan (EWARN) Early warning and disease surveillance bulletin. www.who.int/hac/crises/ssd/epi/en/
⁷ WHO/MOH Situation Reports on Cholera in South Sudan, August 2016.
⁸ Humanitarian Needs Overview, 2016.
⁹ Based on WHO Guidelines for the inpatient treatment of severely malnourished children, available at www.who.int/nutrition/publications/severemalnutrition/9241546093/en/, and WHO Paediatric emergency triage, assessment and treatment: care of critically-ill children Updated guideline 2016 www.who.int/maternal_child_adolescent/documents/paediatric-emergency-triage-update/en/
¹⁰ WHO Pocket book of hospital care for children: Second edition www.who.int/maternal_child_adolescent/documents/child_hospital_care/en/

The package consists of four tools:

- 1) A comprehensive refresher training of 70 slides covering key steps of the Management SAM/MC, addressing both clinical and supportive care for conditions to be treated with the medicines provided. Most slides can be used as stand-alone handouts or posters. It is not a substitute for full training on appropriate management of SAM with medical complications, designed for health-care providers.
- 2) A pictorial manual illustrating medical conditions associated with SAM in children, accompanied by detailed explanations.
- 3) Pocket book of hospital care for children: Second Edition – Guidelines for the management of common childhood illnesses. This includes a full chapter on the inpatient management of SAM, web link to the Pocket book¹⁰ and links to free applications for android phones and iphones.
- 4) WHO video – Emergency Treatment, which illustrates urgent actions required and standard emergency procedures on giving oxygen, glucose, fluid and antibiotics to help improving the quality of inpatient care for the management of SAM/MC in children.

The capacity-building package was illustrated to the nutrition and health community in South Sudan during the 'kick off' meeting and distributed to all nutrition and health cluster partners running inpatient care programmes. Technical orientation on the package has been provided by WHO during ad hoc orientation sessions conducted collectively and on a one-to-one basis with all interested partners and the MoH.

Monitoring

Five monitoring components have been developed by WHO South Sudan aimed at collecting, managing, analysing and reporting on key indicators to track progress, plan response and prioritise actions to improve service delivery (see Box 2).

Preparatory work

A consultative process began in November 2015 led by WCO Emergency Unit/Nutrition, involving the MoH, NC, Health Cluster and implementing partners, and technically supported by WHO HQ. Key steps of the process have included technical consultations with MoH Pharmaceutical Department, Nutrition Unit and Primary Director General; verification and review of the list of medicines to ensure consistency with the List of Essential Medicines of South Sudan; and meetings with partners at different levels to corroborate the effectiveness of drugs utilisation. This infor-

Box 1 Content of WHO SAM kit

The objective of the new WHO kit *Second line drugs for the medical management of Severe Acute Malnutrition with medical complications* is to provide essential drugs for the inpatient management of severe acute malnutrition with medical complications in children (MSAM/MC).

The content is organised into four modules which constitute one kit, sufficient to treat 50 children with SAM/MC. The kit contains 33 medicines and 11 health commodities. The modules are:

Routine drugs module Contains routine drugs also used in outpatient nutrition programmes (anthelmintic, antibiotics, retinol and resomal).

Basic module (analgesic, antifungal, antibiotics, solutions for treatment of hypoglycaemia, dermatological preparations, ophthalmological preparations, health commodities and renewable).

Supplementary module (medicines used in heart failure, antibiotics, ophthalmological preparations).

Malaria module (Coartem tablets, artesunate, malaria rapid diagnostic tests and lancets), incorporated in the kit to address one of the top priority diseases reported in the context under consideration.

The kit does not contain nutritional commodities as it has been designed to complement existing kits, equipment and supplies already provided by UNICEF and WFP. The provision of kits complements the collective NC response in South Sudan, largely focused on outpatient and preventive care of SAM.

The kit was established in line with the recommendations of the 1999 WHO 'Management of severe malnutrition: a manual for physicians and other senior health workers' and the 'Course Director Guide of the related WHO Training Course, 2002'. The list of drugs, initially developed in 2011, was reviewed by SAM management experts, the WHO Expert Committee on Essential Medicines, and with advice from colleagues from relevant WHO departments (HAC, CAH), and revised accordingly.

mation, together with several field-mission findings, was instrumental in better identifying capacity needs, information gaps, stock capacity and skills in management of supplies. This laid the foundations for developing the capacity-building and monitoring packages.

Implementation

Procurement of the first 20 kits by WHO South Sudan began in November 2015. The process of procurement for these initial kits was long (six months) as it involved medicine procurement from different suppliers, MoH clearance and assembly of the kits in Juba. (Now that the kit features in the WHO online catalogue, the shipment takes approximately one month from the purchase order). The first recipient, MoH, and partners' facilities were selected based on average monthly caseload, prevalence of GAM (and associated SAM) in the catchment area, population figures including number of children under five as per the official statistics, documented gaps in stock of medicines, and confirmed presence of medical officers operating in the SC (given the nature of the kit and skillset required). The selection process was coordinated by WHO Emergency Nutrition, supported by the Health and Nutrition Cluster coordination team and guided by the MoH.

The strategy was launched in June 2016 in conjunction with the distribution of kits. The distribution covered nearly one-third of the total functioning SCs across all ten (former) states

(16 facilities out of a total 58¹¹), ranging from hospitals to PHCCs in host communities, IDP and PoC sites. Supplies are calculated to treat 1,000 children over three months. The distribution strategy took into account the different levels of vulnerability across the country and aimed at responding to the high needs in urban contexts and PoC sites, where the SCs integrated in the main hospitals of the capital Juba and clinics in PoC sites required increased support.

Sadly, as soon as the distribution was completed, a renewed and terrible wave of violence erupted again, drastically reducing the capacity of partners to respond to the emergency. Most of the staff were relocated (WHO and other nutrition/health cluster implementing partners' personnel worked remotely from the region in July, August and September) and the monitoring system has been interrupted.

Conclusions

The overall response reflects an active implementing role of WHO in an emergency, specifically in the context of the CMAM approach. WHO's role has been to strengthen complicated case management, which tends not to attract the same attention as the prevention, outreach and outpatient services for MAM and SAM children. The experience in South Sudan reflects efforts to strengthen coordination and synergies between clusters and other key actors at national and field levels in the context of CMAM. The development of a standardised module of medicines for SAM/MC brought a unique opportunity for WHO South Sudan to increase effectiveness and sustainability of life-saving nutrition interventions and to boost WHO strategy shaped around improved inpatient management of SAM/MC, which encompasses provision of medical supplies, capacity-building and review of national guidelines.

For more information, contact:

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Box 2 Monitoring tool

Tool 1: Stock inventory form, to track the quantity of medicines dispensed and the balance in each facility.

Tool 2: The Inpatient Therapeutic Programme (ITP) SC data collection form, employed by the current Nutrition Information System (NIS) of the NC in South Sudan, is integrated as the second tool. Partners are required to continue reporting to the NC on a monthly basis, as per the established mechanism; WHO has supported the NC in advocating for an increased reporting performance.

Tool 3: Additional information on the medical conditions diagnosed and treated, including eye problems, severe anaemia, SAM with oedema, malaria, suspected/confirmed HIV infection and ARI (including TB and pneumonia).

Tool 4: Final feedback form, to assess the appropriateness of medicines and material provided (quantity, suitability) and suggestions for improvements.

Tool 5: Challenges and strengths, for submission at least once and any time during implementation.

¹¹ Nutrition Cluster, March 2016.

Agency profile



WaterAid/ Ernest Randriarimalala, Madagascar, 2016



Name:	WaterAid
Address:	WaterAid, 47-49 Durham Street, London, SE11 5JD, UK
Email:	healthystart@wateraid.org
Website:	www.wateraid.org/uk
Year founded:	1981
Chief executive:	Barbara Frost
No. of HQ staff:	289
No of staff worldwide:	1151

ENN interviewed Dan Jones and Megan Wilson-Jones from WaterAid for the *Field Exchange* agency profile slot. Megan is the Policy Analyst for health and hygiene in the global policy team, while Dan (no relation) is Advocacy Coordinator for Healthy Start, WaterAid's current global advocacy priority to improve child health and nutrition by integrating water, sanitation and hygiene into health policies and programmes worldwide. Both used to work for RESULTS UK (which advocates for building the public and political will to end poverty) and, since they are relatively new to the organisation, checked in with some longer-serving colleagues to answer some of our questions. The answers were very interesting.

WaterAid was set up in 1981 by the UK water industry following a Thirsty Third World conference, which was prompted by the industry's desire to respond to the UN Decade on Water. The UK water industry raised £25,000 and WaterAid was born, starting with projects in Zambia and Sri Lanka. Fast forward to 2016 and WaterAid has just celebrated its 35th anniversary. Its growth has been truly phenomenal: in the six years from 2009 to 2015, it provided 9.6 million people with clean water and a further 13 million with sanitation facilities. It also expanded its country programmes in that time from 22 to 37, including countries in Asia, Africa and the Americas. This year, WaterAid India became the first country programme to become a member of the WaterAid International Federation. The secretariat for the Federation is based in the UK and all members (Australia, Canada, India, Japan, Sweden, United Kingdom and United States of America) are involved in advocacy and fund-raising in respective countries.

Dan explained that WaterAid's general operational model is to work with local partners to target the most marginalised communities. It is best known for its 'taps and toilets' programmes; a reflection of its founding by a group of water engineers. Over the years, the organisation has evolved into using a 'transformation and sustainability advocacy-based model', working closely with national governments, who are encouraged to take ownership of scaling up and delivering

sustainable water, sanitation and hygiene (WASH) services for the whole population. This new strategy is much more about advocacy and exercising influence; WaterAid still supports on-the-ground programmes, but increasingly uses them to demonstrate what can be done to local, district and national decision-makers in order to provide evidence and support the government in scaling up and 'owning' the provision of national services. WaterAid also invests in work to enable citizens to claim their rights. As it looks to influence governments on how much and how they spend on WASH, it supports them in budget planning and tracking. It also looks at international institutions and donor agencies and how WASH needs to be integrated into health, nutrition and education, because WASH underpins many of the Sustainable Development Goals – as Megan puts it simply: "They all need WASH for success". The ultimate aim is national-led plans that donors coordinate and harmonise funding streams behind; an ambition that explains WaterAid's engagement with mechanisms such as the Sanitation and Water for All global partnership (SWA)¹; similar to the SUN Movement in the WASH world.

Megan explained that nutrition is a relatively new area of interest for WaterAid, as part of its expanding work on health. The growing evidence of links between WASH and nutrition, as well as critical work on environmental enteric dysfunction (EED), has helped promote greater focus on nutrition within the organisation. The World Health Organisation (WHO) estimates that half of all undernutrition is linked to infections caused by unsafe water, lack of sanitation and poor hygiene. Most member countries now have health advisors that cover nutrition, and country programmes are increasingly employing health and nutrition staff. Megan mentioned two recent WaterAid nutrition-sensitive WASH programmes. One is in Bangladesh, where the WASH programme has an element specifically to improve access to water for food production. The second, in Nepal, is collaboration with the Ministry of Health and builds hygiene and nutrition behaviour-change into the routine immunisation of rotavirus. WaterAid has just developed internal guidance material on how to improve the nutrition-sensitivity of WASH programmes.

Dan explained that the organisation still sees itself very much as a development agency with a focus on long-term sustainable programming, although emergencies do occur where they operate in fragile contexts. For example, in Nepal recently, WaterAid found itself working as part of the WASH cluster, contributing hygiene expertise to programming. The organisation has also been involved in the Ebola crisis in West Africa, as well as engaging in policy dialogues on anti-microbial resistance. Megan described how these experiences reinforced the vital importance and major gaps in provision of clean water, sanitation and good hygiene in hospitals and health clinics. (WHO estimates that, for example, 38% of health-care facilities in low and middle-income countries lack access to clean water, making preventing and controlling infections impossible).

WaterAid is increasingly collaborating with the SUN Movement at global and national levels. The SUN Movement Secretariat has contributed greatly to WASH policy development at national level, with country staff becoming members of the national Civil Society Alliance. WaterAid has also recently become part of the new BabyWASH coalition, working closely with World Vision (lead) and others. This coalition is bringing together actors from Early Childhood Development, Nutrition, Health and WASH, and was launched at this year's UN General Assembly.

WaterAid believes that multi-sector programming is essential to ending malnutrition. However, its recent *Missing Ingredients* report (summarised in this edition of *Field Exchange*), which analysed national nutrition action plans, found that apart from Timor Leste and Nepal, very few countries are comprehensively embedding and integrating WASH into these plans. Furthermore, very few WASH plans make reference to nutrition. Megan reflected that designing WASH programmes through a nutrition or health lens can lead to better quality programmes; for example by targeting programmes based on nutrition vulnerability. With regard to behaviour change, there is a real opportunity to come together and combine efforts

¹ sanitationandwaterforall.org/

– taking breastfeeding and food hygiene as examples, both involve changing behaviours, which is challenging. However, through utilising multiple delivery channels and delivering joint messaging, especially if one reinforces the other, this could lead to more effective and sustained behaviour change.

WaterAid is not a research-organisation and does not engage in randomised controlled trials, however it is well placed to contribute to the learning and evidence around delivering coordinated and integrated programmes, often described as operational research. Although the nutrition focus of its work has so far been on stunting (where there is the strongest evidence of a link

between WASH and nutrition), it is likely that, given the increasing evidence of overlapping pathways for wasting and stunting, the attention of WASH actors like WaterAid may start to include a focus on wasting.

Our last question concerned the major challenges for scaling up nutrition-sensitive WASH programming. Dan reflected that, in order for WASH services to lead to nutrition outcomes, the services must be utilised, and changing behaviours is very challenging. It requires understanding the specific context (knowing what motivates behaviours and what the barriers are), which is informed through rigorous, formative research. The typical time-frame of WASH pro-

grammes can also be problematic, as they are often too short to report nutrition impact unless followed for a number of years. Finally, stakeholders need to stop thinking in silos. Dan suggested that this occurs on multiple levels – programme silos, sector silos, divided ministerial responsibility in governments, and even silos within donors (humanitarian and development). This, he argues, needs to change.

WaterAid is a large and highly respected WASH agency that is starting to look at how policy and programming can best support nutrition. ENN greatly looks forward to including WaterAid learning in this relatively new area in future issues of Field Exchange.

Views

South Sudan nutrition: Overcoming the challenges of nutrition information systems

The health sector in South Sudan, the youngest nation in Africa, has been growing from strength to strength amid insecurity and emergencies that have affected the general nutrition situation. The Ministry of Health and partners are implementing various nutrition programmes and coordinating efforts to put in place a sustainable nutrition information system. In an interview with Titus Mung'ou, ENN Regional Knowledge Management Coordinator (SUN), Rebecca Alum William, the Director of Nutrition in South Sudan, and Shishay Tsadik, the Nutrition Technical Advisor seconded to the Ministry of Health by Save the Children International, discuss progress made.

Q: How would you summarise South Sudan's current nutrition situation?

A: Overall, the nutrition situation in South Sudan is worrying, with global acute malnutrition (GAM) persistently above the emergency threshold in the Greater Upper Nile, Northern Bahr el Ghazal, Warrap states and Eastern Equatoria states (FSNMS, Dec 2016¹). According to the most recent national data, nearly one third of children under five years old are stunted, 23 per cent wasted, and 28 per cent underweight (SSHHS 2010)². The prevalence of GAM varies seasonally and substantially across states, with peaks of up to 30 per cent in some locations.

From April to August 2016, a total of 26 county-level assessments were conducted; 81% of these assessments showed GAM rates above the 15% WHO emergency threshold. Based on the analysis, the GAM/Proxy GAM³ was 'Extreme Critical' (>=30% prevalence) in Aweil North and Aweil West, which were the only two counties

with recent assessments⁴, and 'Critical' (15% to 29.9% prevalence) in Akobo, Twic East, Uror, Abiemnhom, Guit, Mayom, Mayendit, Panyinjar, Rubkona, Bentiu POC, Pariang, Longetchuk, Nasir, Maiwut, Ulang, Wau, Gogrial West and Gogrial East. Counties classified as 'Serious' (10% to 14.9% prevalence) were Kapoeta North, Melut, Maban and Tonj North, while Kapoeta South is in 'Alert' (5% to 9.9% prevalence).

The deterioration in the nutrition situation is primarily due to physical insecurity (which partly hinders the humanitarian response), the effects of the economic crisis, and depleted stocks from the last harvest. In the Greater Upper Nile, while conflict subsided in most areas, it persists in some pocket areas. Furthermore, the economic crisis (partly due to devaluation of the South Sudanese pound and exponential increase in food prices in 2016), coupled with persistent violence, notably in Wau and some parts of the Greater Equatoria, aggravate the malnutrition situation⁵. Major ad-

ditional contributing factors to malnutrition in the worse-off counties are sub-optimal Infant and Young Children Feeding (IYCF) practices and poor water, sanitation and hygiene (WASH) facilities and practices. Child-feeding practices, such as untimely introduction of complementary foods or poor quality and inadequate quantity of these foods, contribute substantially to the high levels of malnutrition. Additionally, low exclusive breastfeeding practices are a key contributing factor.

In the upcoming season (September to December 2016), the nutrition situation is expected to improve slightly in most counties due to the expected harvest, pasture and availability of milk. Admission trends to nutrition centres are also expected to decrease in most counties in the country during this season. However, taking into consideration the current existing burden of acute malnutrition, market price trends and the existing high level of conflict, the nutrition situation in Northern Bahr el Ghazal and Unity states are not likely to see significant changes and will likely remain in 'Critical' phase (GAM prevalence currently 15% and 29.9% respectively).

Q: Since joining the Scaling Up Nutrition (SUN) Movement in June 2013, what important steps have been taken and milestones achieved in South Sudan as a result of joining the Movement?

A: The Republic of South Sudan officially joined the global SUN Movement in 2013 after a letter

¹ World Food Programme South Sudan, Food Security and Nutrition Monitoring Report (FSNMS) bulletin 18 July 2016.

² South Sudan Household Health Survey 2010 Final Report, published August 2013.

³ Proxy GAM is a term used to denote findings from rapid nutrition assessments where conditions often involving insecurity have prevented standard ENA SMART methodologies being used.

⁴ August 2016 Aweil North and Aweil West exhaustive MUCA screening result.

⁵ World Food Programme South Sudan, Food Security and Nutrition Monitoring Report (FSNMS) bulletin 18 July 2016.

of commitment was signed by H.E the Vice President. The letter expressed the political commitment from the Government of the Republic of South Sudan to scaling up nutrition in the country.

The SUN Movement was launched in the country with commitment to include nutrition in the Food Security Council so that it became 'the Food and Nutrition Security Council (FSNC)' in 2013, the same year of the launch of SUN Movement. The FSNC is a high-level, multi-sector policy coordination platform chaired by H.E the President. SUN Movement activities have been slow since the launch, with limited progress in establishing the country's SUN Secretariat and SUN networks, developing the National SUN Work Plan and other activities. This partly reflects the crisis which erupted in 2013, resulting in a refocus on humanitarian activities. However, revitalisation of the SUN Movement started again in April 2016. A six-month detailed work plan for revitalisation of the country's SUN Movement was developed with a focus on conducting social mobilisation and advocacy, establishment of different SUN Networks, development of work plans for the networks, and development of a national SUN work plan. Factors that contributed to this revitalisation included nutrition being prioritised in Ministry of Agriculture and Health policies, strengthening of the Nutrition Directorate by the Ministry of Health (MoH), and United Nations (UN) agencies supporting a 'rebooting' of the SUN Movement in the country.

The South Sudan SUN Movement Steering committee was established in late 2015 with a responsibility to provide technical support to SUN networks and advise the SUN Focal Point, the Under-secretary in the MoH. This position is temporarily located in the MoH with its permanent location still under discussion. The steering committee is composed of UN agencies (UNICEF, WFP, WHO and FAO) and government line ministries chaired by the MOH Nutrition Director. The Steering committee conducts weekly meetings.

Media advocacy has been identified as one of the key strategies for advancing the SUN Movement in South Sudan. Through advocacy, it is hoped to reach out to the many stakeholders that can have an impact on nutrition in South Sudan, as well as inform them about SUN activities.

The establishment of multi-stakeholder networks including UN agencies, Donor, Civil Society, Academia/Research, and Business/Private Sector has begun.

Government SUN Focal Point and SUN representatives from MoH and Ministries of Agriculture and Finance have attended global and regional meetings and workshops for experience-sharing and learning exchange.

Q: In 2013, South Sudan nutrition actors noted challenges of nutrition information during emergencies and the need for a coordinated, validated Nutrition Information System (NIS). Significant and important changes were then made to validation of SMART surveys, OTP/SEP (Outpatient Therapeutic Programme/Supplementary Feeding Programme) reporting harmonisation, IPC (Integrated Phase Classification) and FSMNS (Food

Security and Nutrition Monitoring System). Have these improvements been maintained and what steps are being taken or are needed to strengthen NIS in South Sudan?

A: Yes, improvements have been made and maintained. There are efforts to integrate the NIS into the District Health Information System (DHIS) and Health Management information system (HMIS). Currently, nutrition information reporting formats, registration books and other tools are being developed and finalised in consultation with the Nutrition Information Working Group (NIWG). Nutrition information is then shared with the M&E Department of the MoH.

Together with the nutrition coverage network, the MoH and Nutrition Cluster facilitated a lesson-learning workshop on how to maintain the capacity of partners and government actors to conduct coverage assessments for the treatment of SAM and MAM and maximise the use of coverage assessment results.

Beyond the traditional SMART assessments, there are initiatives to consider other monitoring mechanisms like the Integrated Food Security and Nutrition Causal Analysis (IFANCA), strengthening the FSNMS and IPC system for South Sudan which helps MoH to make informed decisions.

Q: How is the MoH undertaking its functions as the Secretariat of NIWG? What key lessons and challenges have MoH noted in coordinating activities with NIWG members?

A: In April 2015, the MoH assigned two national technical staff, together with the Nutrition Advisor seconded from Save the Children (SCI) working with the NIWG, to lead the overall coordination of the group. Moreover, there is an initiative to integrate NIWG's Technical Working Group (TWG) into the MoH's M&E Department, where all health and nutrition information activities are coordinated, to ensure sustainability of the function of NIWG. However, due to competing priorities, this may take time.

Q: In South Sudan, the NIWG officially reports to the Nutrition Cluster. How has this arrangement improved coordination of nutrition information?

A: The NIWG is still reporting to Nutrition Cluster, which is one of the limitations, since the MoH is unable to access, utilise and review the working group's performance. However, the move to integrate within the MoH's M&E Department will address this and provide a comprehensive database of assessment proposals and results.

Q: What is the role of the Government and key actors in sustaining the NIWG? How have SUN Movement actors/networks connected with NIS? Have SUN actors' activities been influenced by NIS?

A: The Government and partners sustain the NIWG. Once the SUN networks are established, it is hoped that the NIS will help inform their planning and activities.

Q: How has the NIS helped shape policies and programmes in relation to country and global nutrition targets?

A: The available information from SMART surveys, IPC, FSNMS and programme reports significantly

helps nutrition stakeholders in resource mobilisation, planning and decision-making. However, most nutrition assessments focus on emergencies and the results don't influence stakeholders in addressing longer-term nutrition resilience and protection responses.

Q: The need for advocacy by Nutrition Cluster partners to build MoH understanding of the importance of information systems in relation to preparedness and response planning was identified in 2013. Has it been addressed? How?

A: The MoH has started emphasising the critical importance of NIS. There are moves to integrate systems, as outlined earlier; NIS tools and indicators have been identified; and the MoH is looking for resources to train and build the capacity of health and nutrition service providers and personnel involved in data collection, reporting and analysis on how to use these nutrition information tools (mainly the reporting formats, registration books, monitoring and supervision checklists). The integration/harmonisation will critically allow for a central database within government that can be used for planning, decision-making and further research.

Q: How has MoH addressed the challenge of its capacity to lead and implement NIS and engage technically in NIWG? What progress has the MoH made in enhancing its capacity in information management?

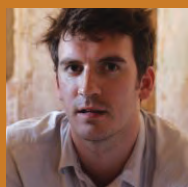
A: The developments outlined so far reflect actions and progress made in this regard, such as moves to harmonise NIS within DHIS and HMIS, integrate the NIWG within the MoH's M&E Department, and transition the Nutrition Cluster NIS to DHIS and HMIS. In terms of enhanced capacity, SCI seconded a Nutrition Technical Advisor to build capacity of the NIWG and NIS and the MoH has assigned two technical staff responsible to the NIWG who are receiving training supported by partners. The MoH has taken a leadership role as chair and co-chair of the NIWG and the MoH Nutrition department is working closely with the Nutrition Cluster team and partners.

Q: Overall, to what extent has strengthening of the NIS (helped by the Nutrition Cluster and largely driven by emergency programming needs) contributed to the aims and objectives of the SUN Movement and how could the existing NIS in South Sudan be strengthened to further enable SUN Movement aims and objectives?

A: The current NIS provides a means to understand the levels of malnutrition in South Sudan, the investments on nutrition, the gaps, priorities and the need for national and local government leadership to tackle the situation. However, in order to strengthen the contribution of NIS to the objectives of the SUN Movement, NIS should move beyond SMART, FSNMS and IPC to include assessments which involve a causal analysis of malnutrition. There is also a need for harmonised and standardised national SMART and coverage survey guidelines, in line with the international guidelines. Furthermore, the most recent national household survey (Demographic Health Survey) was conducted in 2010. This urgently needs updating, as there has been substantial change in the nutrition landscape over the past six years.

Sampling in insecure environments: Field experiences from coverage assessments in Afghanistan

By Marina Adrianopoli and Allan Mpairwe

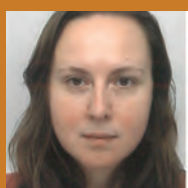


Ben Allen has been Global Coverage Advisor for Action Against Hunger UK for the past two years. He has now left to pursue further study in public health. From 2010 Ben worked with ACF-UK in evaluation,

learning and, more recently, on methodologies to assess the coverage of CMAM programmes. He has directly supported two SQUEAC assessments in Afghanistan and provided remote support to many others.



Mark Myatt is a consultant epidemiologist and senior fellow at University College London. His areas of expertise include infectious diseases, nutrition and survey design.



Nikki Williamson is Senior Project Officer at Action Against Hunger UK, specialising in the coverage assessment of CMAM programmes. Previously she was SLEAC Programme

Manager in Afghanistan, managing the implementation of the five SLEACs addressed in this article. Nikki has also conducted a regional SLEAC and district SQUEAC in Uganda.



Danka Pantchova is Nutrition Surveillance and Prevention Advisor with Action Contre la Faim France. Previously she technically supported all ACF nutrition programmes in Afghanistan, including coverage assessments.



Hassan Ali Ahmed is the Nutrition Surveillance Head of Department with Action Contre la Faim Afghanistan. He has worked on nutrition surveillance projects in Kenya, Somalia and Afghanistan for

the last seven years and has wide experience of conducting nutrition assessments, including SQUEACs, SLEACs, SMART and Rapid SMART surveys.



MUAC screening in Hazrat-e-Sultan District

Location: *Afghanistan*

What we know: Afghanistan is a challenging place to implement community-based management of acute malnutrition (CMAM) and coverage assessments, due to persistent insecurity.

What this article adds: Coverage assessments are important but not life-saving interventions; exposure to risk should be managed and minimised for staff. Insecurity typically affects spatial representation of villages and achieving minimum samples. Including only safe and accessible villages is likely to inflate coverage estimates; bias introduced due to adaptations should be clearly reported. Qualitative information from identified cases and additional qualitative studies can also valuably inform programme reform and, to some extent, compensate for the limitations to the survey sample. A number of steps can help achieve the basic principles of data collection while ensuring the safety of staff and informants. These include balancing risks, triangulation and monitoring of security information, use of local staff, additional context-specific staff training, strong communication protocols and documentation of challenges for wider lesson learning.

When evaluating access and coverage of CMAM services in insecure environments, restrictions on data collection limit assessments. This article describes the challenges faced in sampling during coverage assessments of severe acute malnutrition (SAM) treatment services across Afghanistan and provides some methodological guidance for obtaining the most reliable information while maintaining staff safety. The article draws on experiences from five different SLEAC¹ assessments (in Laghman, Badakshan, Jawzjan, Bamyán and Badghis) and three SQUEAC² assessments (in Samangan, Paktya and Kunar) supported by Action Against Hunger (ACF) and the Coverage Monitoring Network³ (CMN) in Afghanistan⁴. Details on these coverage methods are available at: www.coverage-monitoring.org/training-centre/

The assessments faced two broad categories of conflict related to insecurity. First, *hostile environments* largely caused by conflict between government forces and armed opposition groups (AOGs) or inter-ethnic and tribal conflict. Specifically, this entails unpredictable fighting with a risk of crossfire incidents, checkpoints and kidnap. Second, *direct hostility* towards staff and users by armed groups known to be hostile towards government, United Nations (UN) agencies, and staff of national and international non-governmental organisations (NGOs) was also experienced. Health workers may be perceived to be part of government and data collection activities are viewed with

¹ Simplified LQAS (lot quality assurance sampling) evaluation of access and coverage.

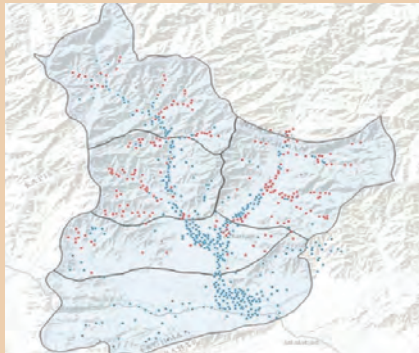
² Semi-quantitative evaluation of access and coverage.

³ See www.coverage-monitoring.org/

⁴ See www.coverage-monitoring.org/country/afghanistan/ to access the reports.

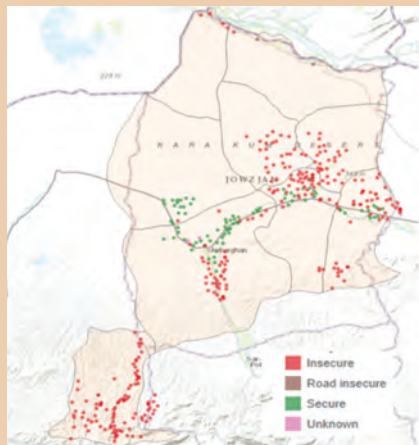
Box 1a Patterns of insecurity: Topography

A number of the assessments took place in mountainous areas where security challenges tended to be found in more remote areas, away from larger towns and roads. This map of Laghman province shows secure (blue) and insecure (red) villages. The secure villages are generally along the main roads at the bottoms of the valleys and the insecure villages in the more remote mountain areas.



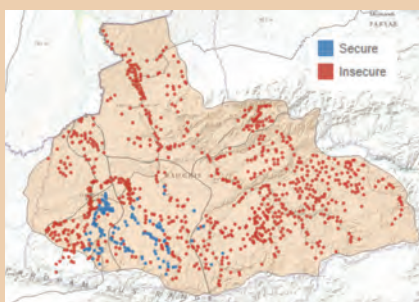
Box 1b Patterns of insecurity: Localisation

In Jawzjan, villages along the international border and along roads accessing areas in the north were more insecure. In the areas remaining, along roads and around the two main towns, the security status of villages was mixed, with secure and insecure villages being in close proximity to each other.



Box 1c Patterns of insecurity: Volatility

In most provinces, an initial indication of the security conditions was useful but likely to change over the duration of the assessment. In the case of Badghis, the initial reports a few months before the assessment indicated that, despite a generally challenging security environment, three whole districts could be sampled. By the time of assessment, the sampling frame was reduced to around half the villages in just two of seven districts.



further suspicion (considered as intelligence gathering). The possibility that family planning activities are being implemented attracts even wider suspicion (i.e. not just from armed groups) of local and/or international NGO activity.

In Afghanistan, war and insecurity are a barrier to accessing healthcare services (MSF, 2014) in terms of both demand (users seeking care) and supply (partners providing care). For example, one in two people are said to be concerned about making dangerous journeys to receive healthcare (MSF, 2014), and implementing partners are under great strain to provide reliable supplies of commodities (ACF, 2016; see this report for more details on the nature of insecurity and how it impacts CMAM service delivery). Awareness of insecurity patterns can help with planning and implementing assessments (see Box 1 for examples).

A key guiding principle is that, whilst coverage assessment is key to improving programme performance, assessment should not expose survey teams or informants to *unacceptable risk*:

Handling insecurity in SLEAC and SQUEAC assessments

In order to achieve a reliable classification or estimation of coverage in a given area, a minimum sample size of SAM children is required, from a spatially representative selection of villages. To achieve this, both SLEAC and SQUEAC stage 3 (wide-area surveys) use a two-stage process, sampling and case finding. The impact of insecurity in Afghanistan on both processes is shown below.

Stage 1: Sampling villages

Two sampling methods are commonly used to select villages: the ‘list method’ and CSAS (grid/quadrat) method. For both, engagement with security advisors and informants familiar with the area (e.g. programme and survey staff) was essential to assess the level of insecurity in each village. Some subjective interpretation (including understanding of unacceptable risk and assessment of the reliability of information required) was required, but triangulation by source (e.g. use survey staff, programme staff, health

centre staff and locals) strengthened this appraisal. During each assessment, at least three informants were openly asked to identify villages that they knew to be unsafe, to give the reasons why, and to identify other potentially unsafe/inaccessible villages. Unsafe villages were monitored.

Villages identified as unsafe and inaccessible from all sources were considered dangerous; where lists did not concur, further data/informant discussion clarified the situation. The end result was a full list of villages with security status and reasons for insecure classification. Insecure villages were not visited and the security situation for selected villages was monitored for change. If there was any doubt, case finding in that village was postponed until the security situation had improved (if within the survey period) or was abandoned. Table 1 shows the number of villages that were removed (during the initial security review) and then abandoned (due to a change in the situation) for each SLEAC assessment undertaken in Afghanistan. A rigorous, open and participatory process in the security review and on-going monitoring was important to ensure staff trust in the final security decisions, whilst benefiting from the team’s local knowledge and experience.

Stage 2: Case finding at village level

Once villages had been selected, it was necessary first to identify an appropriate survey team to go to each village, and second to identify safe routes into and out of villages. To increase acceptance, local survey staff were employed who knew local customs (e.g. dress codes, the need for chaperones for female staff), were aware of whether communities accepted non-local women, and were familiar with local perceptions of data collection activities. Survey team members for each village were then carefully considered to ensure familiarity. If at least one member of a survey team was already known to local authorities (e.g. governors, police commanders, paramilitary commanders) and local leaders, then activities at village level were facilitated. Teams and individuals unfamiliar with an area or different ethnicity could be at higher risk of being threatened, told to leave or kidnapped. In

Province	Total # Villages	Proportion remaining after initial security review	# Villages sampled	# Villages visited	% of sampled villages abandoned	Reasons for abandoning villages
Badakhshan	1,692	53%	91	85	7%	Clashes broke out in some villages and elsewhere, the team were advised on arrival to turn back. One small town selected became a strategic checkpoint for AOG and was therefore considered too dangerous to visit.
Badghis	985	13%	28	25	11%	Recent escalation in conflict from nearby villages.
Bamyan	1,882	100%	141	133	6%	Abandoned due to snow and flooding.
Jawzjan	395	23%	25	23	8%	A local conflict broke out amongst two communities.
Laghman	621	60%	45	33	27%	Half of these were in Alingar district where IMAM activities were ceased. Others were in mountainous areas where conflicts escalated and teams were told to turn back by community elders.



MUAC screening in Hazrat-e-Sultan District

order to identify safe routes into and out of villages, a risk assessment was undertaken, again triangulating various sources of information. Security on roads is often subject to rapid change (e.g. due to the use of roadside bombs or checkpoints) and required close monitoring.

On the day of visiting the village, a security assessment was conducted using available sources (programme staff, drivers and friends) and, when possible, village leaders were called in advance to confirm safe access. If no village-level contact was available but all available information indicated safety, then teams proceeded and contacted village leaders upon arrival. When information at base was not available, survey teams assessed the security situation while travelling to the village and upon arrival. In Afghanistan, village leaders would advise survey teams to leave if hostile forces were present in the village or nearby. Teams should and would abort field activities if there is anything above a low level of risk.

Once the team and routes had been identified, the following considerations were made to ensure ongoing monitoring of the security situation:

- Work with survey teams and teams from other programmes to monitor the on-going security situation;
- Liaise with local security services and paramilitary organisations;
- Monitor local radio traffic covering UN, NGO, police and paramilitary frequencies and in some settings, local broadcast radio stations; and
- Maintain a radio or telephone network to monitor the locations and status of teams in the field.

Depending on the existing staff capacity, additional resources (for example, a specialist in radio and security) may be needed to ensure this level of communication is maintained.

In each village, active and adaptive case finding (which involves local knowledge and

local informants to find suspected cases and assumes a level of social cohesion) and door-to-door case finding (going to every house) were used to identify SAM children. Once a suspected case was found, the child was screened using mid-upper arm circumference (MUAC) and for bilateral pitting oedema. The caregiver was asked whether the child was in treatment and all cases were interviewed in order to identify boosters and barriers to access.

Due to the security risk, assessment leaders, who were often international staff, were not permitted to travel to villages to supervise data collection, and field training was not possible. To compensate, training included extra practical classroom-based exercises, including role-play. A tailored form ensured that teams recorded

numbers of children screened, houses visited, cases found, and households refusing entry in each village.

During fieldwork, communication was also enhanced. Mobile telephone or radio contact was sustained during village visits for assistance and remote supervision. In the earlier stages, teams often called the survey leader on arrival and on concluding case finding to crosscheck the course of action decided. When possible, end-of-day debriefings, in person or by phone, were conducted and information gathered (including challenges faced and solutions to overcome them) was shared amongst the entire team for collective learning.

Consequences of adapted sampling

The insecure environment in Afghanistan challenges spatial representation of villages and achieving a minimum sample of children – two key aims of SLEAC surveys and stage 3 (wide-area survey) of SQUEAC surveys.

The sample of villages that are both accessible and safe is unlikely to be spatially representative of the entire intended programme catchment area; identified insecure villages will tend to be isolated. If spatial representivity is likely to be badly affected, alternative villages (or contingency clusters) could be selected as close to the original village as possible. In the Afghanistan assessments, alternative villages were not used due to time restraints, resulting in a smaller sample size than planned and therefore less accurate and precise coverage classification or estimates. The removed villages are typically places where service delivery and access are more affected, and where coverage is likely to be lower. Including only safe and accessible villages is likely to inflate coverage estimates. The sampling method and any potential bias should be clearly noted when reporting the assessment.



MUAC measurement at an OTP site

Table 1 Villages considered insecure initially and subsequently abandoned due to insecurity**Introduction**

During the SLEAC assessment in Jawzjan, large areas of the province and entire districts were deemed to be inaccessible for the survey team. In order to understand more about coverage and access of SAM treatment in these areas, a small study was designed.

Methodology

Qualitative data was collected through structured interviews with programme management staff, health facility staff and patients. Three health facilities where surrounding villages were deemed insecure were visited. In each health facility, interviews were conducted with at least two staff members (engaged with CMAM) and two to four patients (visiting for CMAM treatment).

The following considerations were made to maintain the safety of the surveyor:

- Locally known survey team members were sent and local community members and health staff should be informed in advance.
- Advise that the study is about the CMAM programme – do not say it is a study on security since this may raise unnecessary concerns.
- When meeting people, do not ask for interviews (which are often seen as interrogatory), just explain that you are there to talk about the CMAM programme.
- Ensure the conversation is conducted in a secure and relaxed environment where the informant can speak openly and in a free manner.

Themes investigated

Interview guides were developed to support surveyors in collecting useful information on challenges to access and service delivery. Different guides were developed for caregivers and for staff to collect the following information:

Caregivers at the health facility:

- Information about their journey: means of transport, duration, cost, whether there were obstacles, whether insecurity affects the journey and how the decision is made to visit the facility.
- Information about available alternatives when the decision is made not to visit the health facility, such as use of CHW (community health worker) or traditional medicine.

Staff at the health facility:

- Information about the running of the programme: details of any past closures due to insecurity, and whether insecurity affects the logistical running of the programme, for example in ready-to-use therapeutic food (RUTF) supply.
- Information about activities away from the health facility such as alternative strategies to reach SAM cases, e.g. use of CHWs, outreach activities and training and supervision visits.

Findings

These investigations provided information about types of insecurity, as well as the impact of insecurity on community access and on the provision of services.

Impact on community access:

- People are not able to take the road because of

checkpoints and threats on the way.

- Women were not able to travel alone, and therefore without a male chaperone (who was not always available) were not able to access services.
- More than half of the informants (five out of nine) spoke of clashes between AOG and government security forces (Afghan National Security Forces (ANSF)) as a factor preventing them from making the journey to the health facility.
- Instead of making a journey, they either use alternative treatments (such as buying medicine from shops or using fortified milk) or simply must wait until security is better before travelling to the health facility.

Impact on provision of services:

- Insecurity inhibits activities required for operating the SAM sites, specifically those involving movement within the district, such as monitoring, training, supervision and supply of RUTF.
- Delivery of RUTF was managed through relationships with local shura, who had strong links with armed groups, which enabled the continuation of treatment services.
- Many areas in the province are too insecure for any monitoring or supervision to be conducted safely. For example, in Qush Tepa and Darzab, which are long-term insecure, the last support visit to the health facilities was possible in 2010.
- In Darzab, the health facility (a sub-centre) has now closed because the staff did not feel safe to work there.

In order to compensate for loss in survey coverage and to access information in inaccessible areas, additional quantitative and qualitative studies can be conducted. Quantitative analysis can compare numbers of admissions or defaulting rates from insecure areas with those from secure areas to look for differences and provide some indication of coverage levels.

Interviews can be conducted in nearby health centres with residents that have travelled from inaccessible areas, and with health staff that cover those areas. Alternatively, specific survey staff members for whom the risk is deemed acceptable may be able to visit an otherwise inaccessible area. In these circumstances, the staff member should be carefully prepared and consulted, together with security advisors. Box 2 outlines details of a qualitative study on insecurity conducted in Jawzjan.

Guidance for practitioners

It is possible to undertake SQUEAC and SLEAC assessments in insecure environments, but this may affect the quality and reliability of the information. The bias introduced by the removal of villages from the sampling frame must be recognised and clearly reported. However, the qualitative information (on barriers and boosters)

collected from the cases found during the survey remains useful and can provide evidence for programme reform.

A number of steps can ensure the most reliable and comprehensive information regarding coverage and access, achieving the basic principles of data collection while ensuring the safety of staff and informants. The following ten points should be considered by practitioners undertaking coverage surveys in insecure environments:

1. Adhere to the basic principle that **CMAM programmes are child-survival programmes, therefore performance must be assessed** and coverage assessments themselves are not life-saving activities throughout the assessment;
2. **Ensure triangulation of security information** with survey team members and other local sources related to the accessibility of villages;
3. Use a **rigorous and participatory process** to review the security status of villages;
4. Ensure **constant assessment of the security situation**, especially in sampled villages and access routes;
5. **Use local survey staff** who both know the area and are known in the area;
6. Where possible **make contact with the**

village leader prior to travelling to the village;

7. Allow for **extra time training and supervising survey teams** and include role play activities;
8. Ensure **regular communication** with survey teams to monitor their safety and provide close supervision, including daily debriefings;
9. Develop **context-specific qualitative and quantitative studies to investigate factors affecting access** in the inaccessible areas; and
10. **Document all limitations, challenges and adaptations** to the methodology in the final report.

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A young caregiver with an infant in her charge

Intergenerational cycle of acute malnutrition among IDPs in Somalia

By Samson Desie



Samson Desie is a nutrition specialist who has worked in the sector for more than a decade and currently works as Nutrition Cluster Coordinator with UNICEF Somalia.

Location: *Somalia*

What we know: High levels of acute malnutrition persist among internally displaced children in Somalia; socio-cultural practices that impact women, including teenage pregnancy, are a major underlying cause.

What this article adds: A Nutrition Cluster (NC) visit to an outpatient therapeutic programme in Garowe, Somalia, found only one third of children were accompanied by their mother; over half of mothers were less than 18 years of age. The remaining admissions presented with a sibling, usually less than ten years of age; mothers were absent in search of work. The NC considers school nutrition a key strategy to break the intergenerational cycle of malnutrition in the Somalia context; it invests in nutrition development and fosters humanitarian-development connections. To address the circumstances witnessed in Garowe, the NC has developed a pilot comprehensive school-nutrition programme in collaboration with the Education Cluster to build evidence with a view to scale-up.

Background

Children in internally displaced persons (IDP) sites in Somalia remain at increased risk of acute malnutrition. The validated and endorsed Deyr (short rainy season) 2015 nutrition survey conducted by Somalia Food Security and Nutrition Analysis Unit (FSNAU) indicates a deterioration in the nutrition situation in five IDP sites (Dhobley, Baidoa, Dolow, Garowe and Galkayo) among the 13 sites surveyed in September 2015; these are areas of critical concern (see Figure 1). Furthermore, the latest Gu (main rainy season) 2015 findings show little improvement in the median global acute malnutrition (GAM) rate, with IDPs in Dolow having the worst rates of malnutrition (sustained critical GAM rates of 25% and severe acute malnutrition (SAM) prevalence of 6.1%). Further deterioration was also observed, moving from Serious to Critical in Garowe and Galkayo (sustained hot spots

for the last five seasons), as well as among Bossaso IDPs (12.5 % to 16.8 %). The results call for urgent action in this protracted crisis, and the critical need to scale up multi-sector programmes in an integrated manner, including at IDP site level.

“When a 13-year-old girl gets married and has a baby, there is often stress between her and her husband, which can lead to divorce... After a divorce, the girl is left to provide for the children, but most often they are not able to due to lack of resources” (Mothers focus group discussion).

The underlying causes of sustained malnutrition

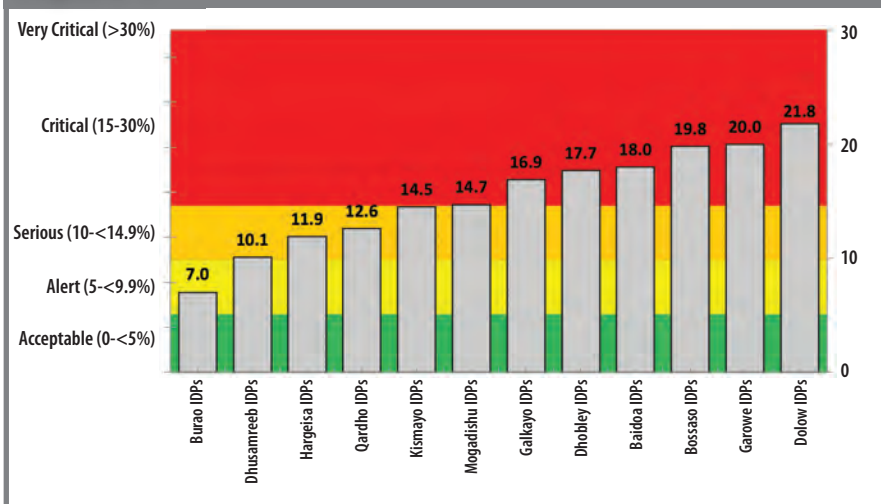
Sustained levels of acute malnutrition in IDP sites have always been a challenge in Somalia; studies and surveys have been conducted to understand the underlying causes of its persistence despite ongoing interventions. A recent

nutrition causality study outlines socio-cultural practices as one of the major underlying causes and highlights certain socio-cultural beliefs and practices in particular that have a major impact, including female genital mutilation (FGM), early marriage and premature, repeated child bearing by girls (13+ years) (SNS Consortium, 2015). Infant and young child feeding (IYCF) practices are weak and adversely affected by heavy women's workloads, increased shifts to cash economies and absent fathers (due to divorce and khat use).

The Nutrition Cluster (NC) visited a Garowe IDP site on 24 February 2016. At the time, 37 children were admitted in the outpatient therapeutic programme (OTP). During the visit, only 14 (36%) children arrived with their mothers; eight (57%) of the mothers were aged 18 years or under. The remaining children came to the centre with their siblings, who are mostly children under the age of ten themselves. On further discussion with these children, it was understood that most mothers were away in town, looking for casual labour (e.g. cleaning, cooking, carrying and domestic service). Leaving children to be attended by older siblings is a significant factor limiting the care children require, especially those suffering from malnutrition. The fact that many mothers are under 18 years old is also an underlying cause of the sustained level of acute malnutrition.

The story of Sabri and her daughter (see Box 1) is typical of the phenomenon of the intergenerational cycle of malnutrition which sees teenage mothers give birth to an intrauterine growth-restricted infant and/or a low-birth-weight (LBW) baby (a baby born weighing less than 2.5 kg). The intergenerational cycle of

Figure 1 Prevalence of GAM among IDPs in Somalia (Post-Gu, 2016)



growth failure, first described in 1992 in the Second Report on the World Nutrition Situation (UNSCN, 1992) and illustrated in Figure 2, explains how growth failure is transmitted across generations through the mother. The theory is that small adult women are more likely to have LBW babies, and LBW children are more likely to have growth failure during childhood. Thus, in turn, girls born with a LBW are more likely to become small adult women. The cycle is accentuated by high rates of teenage pregnancy. This situation, coupled with early marriage and early divorce in Somalia, is becoming a major problem but is not fully appreciated by all stakeholders.

Actions to take in Somalia

The authors of the UNSCN Nutrition Policy Paper No 18 on LBW (Pojda & Kelley, 2000) found that many questions about reducing LBW rates remain unanswered. The paper highlights the urgent need to find sustainable practices that will improve women’s nutritional status prior to pregnancy and weight gain during pregnancy. Many actions can be taken in the Somalia IDP context. Efforts to improve adolescent nutrition are needed, especially

to control micronutrient deficiencies in adolescent girls. The nutrition programme in Somalia has never carried out such activities and should be piloted in selected IDP sites with a view to scale-up. Districts with high burdens of sustained acute malnutrition could also be targeted with similar actions; lessons from the experiences would help to scale up such approaches. The strategy should also attempt to link with livelihoods and other social protection and safety-net programmes.

Teenage pregnancy is a probable significant cause of malnutrition in most parts of Ethiopia, including IDP sites. It is well recognised that the size and body composition of the mother at the start of pregnancy is one of the strongest influences on foetal growth (Kramer, 1987). Studies in the USA have shown that there is maternal and foetal competition for nutrients in adolescent mothers, and birth weight of infants of adolescent mothers are around 200g lower compared to non-adolescent mothers (Scholl et al, 1997). Given this, efforts should be directed towards developing community-based adolescent girls’ clubs in order to help with the early detection of



Sabri Abdiaziz Ali with her daughter, Palestine Mohamed

Box 1: Sabri’s story

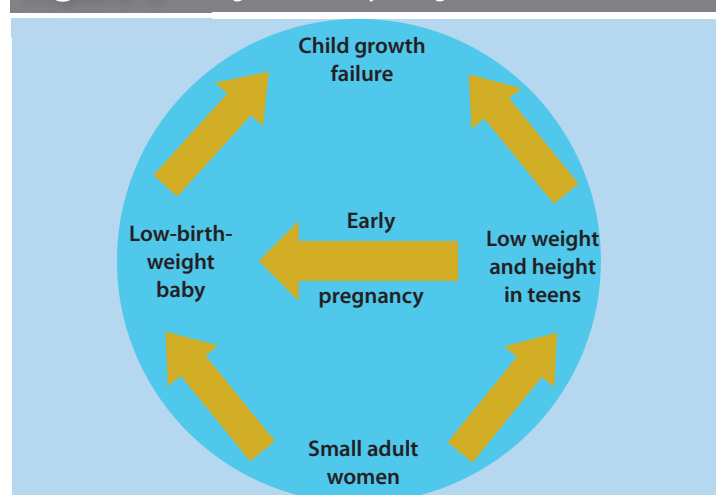
In Garowe IDP site, Sabri Abdiaziz Ali is the 16-year-old mother of an 11-month-old girl, Palestine Mohamed. Sabri has lived almost her entire life as an IDP, living here since 2001, when she was treated for malnutrition at the age of one. She was married at 14 and divorced by the time her daughter was just two months old. Since then she has been living with her mother, who is also an IDP. She often goes to the town seeking work to help provide for her daughter.

Sabri hopes to be able to educate her daughter and not remain in the IDP camp for the rest of her life. She breastfed her daughter for two months only, until the time of her divorce, and has not breastfed since as she is busy earning survival income. Her daughter often suffers from diarrhoea and cough and was recently diagnosed, at ten months old, as severely malnourished. Her daughter’s condition has significantly improved since she was admitted to the UNICEF-supported OTP four weeks ago. Now at 11 months, she is improving and gaining weight with regular treatment and therapeutic feeding. During the visit, she had a good appetite and was active. The OTP service is implemented by Save the Children International (SCI) and fully funded and supported by UNICEF and USAID.



An adolescent mother with her baby

Figure 2 Intergenerational cycle of growth failure





Young mothers and caregivers attending the OTP

teenage pregnancies in communities and educate girls on improved life skills for teenage pregnancy prevention.

Actions to take: Adolescent interventions

1. Establish a system to provide comprehensive and routine nutrition assessment and counselling services for adolescents at community, school (Ministry of Education, 2012) and health-facility level;
2. Develop key action-oriented, nutrition behavior-change communication messages for adolescents, especially for girls, and promote and demonstrate these messages through different communication channels, community and facility contact points;
3. Ensure adolescents have access to micronutrient services;
4. Ensure access to reproductive health services for boys and girls (delaying early marriage and early pregnancy, family planning, prevention of harmful traditional practices);
5. Ensure access to and utilisation of water, sanitation and hygiene (WASH) practices in households, communities and schools;
6. Conduct regular monitoring of nutritional status of school-age children/students; and
7. Promote girls' education and economic empowerment of out-of-school adolescents.

Actions to take: Nutritional status of women
The influence of maternal nutritional status on pregnancy outcomes seems equally important in early and late pregnancy (Neufeld et al, 2004)

and the risk of delivering a LBW baby seems to be determined very early in pregnancy (Smith et al, 2002). In addition, evidence from Asia (Mason et al, 2002), rural India (Rao et al, 2001), Indonesia (Semba et al, 2008) and refugee camps in Nepal (Shrimpton et al, 2009) suggests that consumption of micronutrient-rich foods (milk, green leafy vegetables, fruit and parboiled rice) and iodized salt during early pregnancy is associated with increased birth weight and weight-for-age in young children. The following interventions are therefore recommended for inclusion in existing services, in particular for pregnant and lactating women (PLWs):

1. Establish a system to provide comprehensive and routine nutrition assessment, counselling and support services, including pregnancy weight-gain monitoring; promotion of maternal nutrition (including adequate food intake); provision of supplementary food to malnourished PLWs; and ensure early identification and treatment of acute malnutrition among PLWs;
2. Ensure PLW access to micronutrient services, including provision of routine iron folic acid or multiple micronutrient supplementation; promotion of the use of iodised salt; and deworming during the second and third trimesters of pregnancy;
3. Develop key action-oriented nutrition messages to increase the involvement of fathers, grandparents and faith-based/traditional community organisations in supporting PLWs, including ensuring access and utili-

sation of WASH practices; and

4. Support the involvement of women groups in nutrition-sensitive agriculture and livelihood programmes and ensure access to time and labour-saving technologies.

Nutrition and Education Clusters join forces

Their experience of the horrifying reality prompted action by the NC to come up with a concrete option to reach adolescent girls. The NC considers school nutrition a key strategy to break the intergenerational cycle of malnutrition in Somalia. A school-nutrition initiative also offers strategic engagement for a long-term resilience perspective, is in the interests of developmental nutrition and helps bridge the humanitarian-development nexus. In collaboration with the Education Cluster, a comprehensive school-nutrition programme has been developed which will be implemented in a few selected schools to generate further evidence with a view to possible scale-up. The project will follow a continuous learning and adoptive approach and will start with an adaptation of the World Bank FRESH (Focusing Resources on Effective School Health, Hygiene, and Nutrition Programmes) framework. Funded by the Somalia Humanitarian Funding (SHF) as a pilot, it will be implemented by SCI in Baidou. We look forward to sharing learning from our ongoing implementation of comprehensive school nutrition among IDPs as well as host communities.

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People in aid

INASP



The research team investigating men and household food security in an internally displaced persons camp in Kenya (see research in this edition)

Evidence Aid, 2013



Participants in the Evidence Aid priority setting meeting, 2013 (see research in this edition)

Kamal Singh, Kenya



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Front cover

Pupils from the Catholic school in Ampahadimy Fokontany running in front of their sanitation block. Ankazobe district, Madagascar; WaterAid/ Ernest Randriarimalala, Madagascar, 2016

About ENN

ENN is a UK registered charity, international in reach, focused on supporting populations at high risk of malnutrition. ENN aims to enhance the effectiveness of nutrition policy and programming by improving knowledge, stimulating learning, building evidence, and providing support and encouragement to practitioners and decision-makers involved in nutrition and related interventions.

ENN is both a core team of experienced and academically able nutritionists and a wider network of nutrition practitioners, academics and decision-makers who share their knowledge and experience and use ENN's products to inform policies, guidance and programmes in the contexts where they work.

ENN implements activities according to three major workstreams:

Workstream 1: Experience sharing, knowledge management and learning. This includes ENN's core products: *Field Exchange*, Nutrition Exchange and en-net, as well as embedded knowledge management within two key global nutrition fora (the Scaling Up Nutrition Movement (SUN) and the Global Nutrition Cluster (GNC)).

Workstream 2: Information and evidence on under-researched nutrition issues. This comprises ENN's research and review work on filling gaps in the evidence base for improved nutrition policy and programming.

Workstream 3: Discussion, cooperation and agreement. This includes a range of activities for discussing and building agreement and consensus on key nutrition issues. It includes ENN's participation in and hosting of meetings, its activities as facilitator of the IFE Core Group and its participation in the development of training materials and guidance, including normative guidance.

ENN's activities are governed by a five year strategy (2016-2020), visit www.enonline.net

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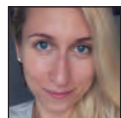
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World Vision



**ACTION
AGAINST
HUNGER**



BritishRedCross



WFP



**CONCERN
worldwide**



UKaid
from the British people

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