

# Field Exchange

Emergency Nutrition Network



**Special section on MAMI:  
Management of at risk mothers and  
infants under six months**

# Contents

## 1 Editorial

## Field Articles

- 2 Results and lessons learned from WFP's efforts to support adolescent girls in Niger
- 6 Participatory, decentralised monitoring to improve quality of CMAM services in Sudan
- 34 Treatment of severe acute malnutrition through the Integrated Child Development Scheme in Jharkand State, India
- 37 Nutrition-sensitive agriculture in Zambia: A continued work in progress
- 64 Experiences of implementing CMAM in Yemen and number of deaths averted
- 68 Implementation of nutrition surveys using SMART methodology in sub-Saharan Africa
- 75 Scaling Up Nutrition (SUN) in Protracted Crisis: The South Sudan Civil Society Alliance (CSA) experience
- 79 Screening for maternal and child malnutrition using sentinel-based national nutrition surveillance in Afghanistan
- 84 Nutrition programming in Northern Bar el Ghazal, South Sudan: A time to reflect

## 50 Special Section on MAMI: Management of at risk mothers and infants under six months

### 50 Editorial

### Field Articles

- 51 The Paediatric Development Clinic: A model to improve outcomes for high-risk children aged under-five in rural Rwanda
- 54 Piloting the C-MAMI approach in the Rohingya response in Bangladesh

### News

- 57 Updated C-MAMI Tool now available

### Research

- 58 The cost of implementing the C-MAMI tool to treat nutritionally vulnerable infants in Bangladesh
- 61 Severe malnutrition in infants under six months old: outcomes and risk factors in Bangladesh

### Evaluation

- 62 C-MAMI tool evaluation: Learnings from Bangladesh and Ethiopia

## Research

### 10 Snapshots

- 10 The "ComPAS" trial combined treatment model for acute malnutrition: study protocol for the economic evaluation
- 10 Risk factors for vitamin A and D deficiencies among children under five years old in Palestine
- 11 Effect of an emergency cash transfer programme on weight gain and acute malnutrition risk in Niger
- 11 Use and misuse of stunting as a measure of child health
- 12 The consumption of animal-sourced foods by infants in low-income settings

- 12 Packaged foods: What role can they play in improving consumption of nutritious food?
- 12 Children who are both wasted and stunted are also underweight and have a high risk of death
- 13 Study of the cost, cost-efficiency and cost-effectiveness of three cash-based interventions in Pakistan
- 13 Quality of care for treatment of uncomplicated severe acute malnutrition delivered by community health workers in Mali
- 14 Effectiveness of treatment for severe acute malnutrition delivered by community health workers
- 14 Cost-effectiveness of the treatment of uncomplicated severe acute malnutrition by community health workers in rural Mali
- 15 Review of scale and drivers of persistent global acute malnutrition
- 16 Policy brief on engagement between public and private sectors for nutrition
- 18 A growth reference for MUAC-for-age among school age children and adolescents and validation for mortality
- 19 Urban diets and nutrition: Trends, challenges and opportunities for policy action
- 21 Technical brief on the cost of malnutrition
- 23 Feasibility of a milk matters initiative to enhance milk intake in children over six months of age in Somalia
- 25 Putting budget data to work for nutrition
- 27 Weekly menu for midday meal in Bangladeshi schools: Caregivers' choices
- 29 Infant formula advertising in medical journals: a cross-sectional study (and struggle to publish)
- 31 Training Care Groups on sexual and gender-based violence in rural Niger

## News

- 41 Report on innovations in CMAM
- 42 Adolescent Nutrition Interest Group meeting
- 43 Child wasting and stunting: Time to overcome the separation
- 43 Revised CMAM Training Guide
- 44 Guide to anthropometry: A practical tool for programme planners, managers and implementers
- 44 Global humanitarian assistance report 2018
- 44 New country-level Nutridash data available on updated State of Acute Malnutrition website
- 45 Making connections: Joint meeting of WaSt Technical Interest Group and MAMI Special Interest Group
- 46 Paving the way from research to action: cash and nutrition
- 47 Food assistance for nutrition: Evidence Summit
- 48 Access to Nutrition Index
- 48 HIV and infant feeding in emergencies operational guidance
- 49 10th edition of Nutrition Exchange
- 49 en-net update: June to August 2018 inclusive

## Evaluation

- 71 Effectiveness of a community-based IYCF support group programme among ethnic minorities in Vietnam



*Dear readers,*

**A**part from the thematic focus on MAMI in this 58th issue of Field Exchange (see dedicated editorial that introduces the section on page XX), we have a very diverse set of field articles and research. Rather than try to identify common threads between articles, we decided simply to highlight some of the most significant findings. Without wishing to over-sensationalise them, we thought the following might stimulate some interest:

### **Do families really ever starve their children to get or maintain access to programmes?**

A study from South Sudan by Natalie Sessions and Regine Kopplow of Concern Worldwide found that mothers were indeed incentivised to keep children in treatment programmes for global acute malnutrition so that the family could have continued access to both the nutrition products and the general food distribution programmes (GFDs) available to families with malnourished children. There have been many anecdotal reports of this kind of behaviour where food stress has been severe, but this is one of the only studies we are aware of that has employed multiple focus group discussions and key informant interviews to highlight the problem.

### **At a global level, what percentage of household food comes from market purchase?**

A recent blog by the relatively new Executive Director of GAIN, Laurence Haddad, states that average households in nearly all countries in the world now acquire the majority of their food from markets, most of which are packaged foods, and the market for this is growing in middle-income countries (and probably also in low-income countries). Laurence optimistically concludes and



Mother and her baby meeting with the PDC Social Worker in Rwinw kavu, Rwanda, 2018

Cecille Joan Aulia, Partners in Health

elaborates on how this presents both a business and nutrition opportunity.

### **Do school feeding programmes ever have a measurable impact on nutrition?**

Yes – according to an article by WFP on a school feeding programme in Niger. The programme provided daily meals for girls and boys in primary schools fortified using micronutrient powders, and weekly iron and folic acid supplements provided to secondary school girls and boys. The programme significantly reduced anaemia prevalence in primary school boys and girls and secondary school boys, but not in secondary school girls (likely due to higher needs). Nutrition knowledge, dietary diversity and consumption of iron-rich foods also improved. The proportion of girls passing the school year doubled. Scale-up is using a more intensive, girls-only supplementation protocol targeting the poorest at household level, not just through schools.

**How much does a nutrition survey cost?** I tend to walk around with a figure of £20,000 in my head. A recent UNICEF/Action Against Hunger review examined the implementation of SMART surveys across sub-Saharan Africa (45 countries)

and the factors that have facilitated their institutionalisation. Thirty-two countries had implemented SMART surveys. Average costs are US\$21,100 (about £16,400; national surveys) and US\$15,050 (about £11,700; small-scale surveys) – so I wasn't that far off.

### **Is the disconnect between MAM and SAM programming still taking place in current emergencies?**

We're afraid it is. In this issue we have the example from Yemen. An article by Najwa Al-Dheeb, Anna Ziolkovska and Stanley Chitekwe (UNICEF) describes how community-based management of acute malnutrition (CMAM) programming, introduced in 2009, has evolved to meet increased caseload and now includes mobile teams, integration with vaccination and community health worker services, and increased geographical coverage. Progress is reflected in significant improvement in cure rates, defaulter rates and estimated number of deaths averted (over 221,669 deaths of children under five years old were averted between 2012 and 2017). However, management of acute malnutrition (MAM) treatment scale-up has not kept pace with severe acute malnutrition (SAM) treatment (48% versus 72% geographical coverage).

Misaligned scale-up between SAM and MAM is not unusual in the articles we feature in Field Exchange; SAM scale-up dominates. This is partly what has prompted us to embark on producing a special edition in 2019 which will capture experience and research that addresses the continuum of acute malnutrition care.

We hope this short editorial has made you want to read further. Enjoy!

Jeremy Shoham  
Co-Editor, *Field Exchange*

If you would like to write an article for *Field Exchange*, email [Chloe Angood](mailto:Chloe.Angood@ennonline.net) with ideas: [chloe@ennonline.net](mailto:chloe@ennonline.net). We welcome contributions any time.



Mother receiving a consultation for her twins in Kirehe PDC, Rwanda, 2018

Cecille Joan Aulia, Partners in Health

A girl and her teacher in a school in Simiri, Niger, 2017

## Results and lessons learned from WFP's efforts to support adolescent girls in Niger

By Alexandra Pirola, Benedict Tabiojong Mbeng and Mica Jenkins



Alexandra Pirola worked as Programme Policy Officer in the Nutrition Unit of the World Food Programme (WFP) Niger Country Office

between 2015 and 2017, focusing on nutrition and gender-sensitive issues. She holds an MSc in International Development and Humanitarian Emergencies from the London School of Economics (LSE).



Benedict Tabiojong Mbeng is Head of Nutrition for WFP Niger country office. He has over 30 years' experience in nutrition programming and

holds an MPH in Health Development from the Royal Tropical Institute (KIT) Amsterdam. He previously worked for WFP in Rwanda, Central Africa Republic (CAR) and Niger, as well as for UNICEF in CAR.



Mica Jenkins is the Research and Evidence Officer for the Nutrition Division at WFP headquarters. She holds an MSc in Health and Human

Development with a focus on nutrition and sustainable food systems. Prior to joining WFP, Mica implemented rural development and research projects in Mozambique and in the Dominican Republic.

### Location: Niger

**What we know:** Adolescent pregnancy, associated with early marriage, greatly increases maternal and infant morbidity and mortality, has poor long-term outcomes, and fuels intergenerational malnutrition.

**What this article adds:** A World Food Programme pilot in Niger (2012–2015) targeted vulnerable adolescents with a joint education and nutrition programme delivered through primary and secondary schools. Daily meals for girls and boys in primary schools were fortified using micronutrient powders. Weekly iron and folic acid supplements were provided to secondary school girls and boys. A monthly scholarship was provided to girls to encourage school attendance, alongside community sensitisation. Anaemia prevalence significantly reduced in primary school boys and girls and secondary school boys, but not in secondary school girls. Nutrition knowledge, dietary diversity and consumption of iron-rich foods improved. The proportion of girls passing the school year doubled. An adapted, scaled-up version of the programme includes targeting education and support to poor and very poor households and a more intensive, girls-only supplementation protocol. Key lessons to date include the importance of national policy alignment, multi-stakeholder engagement, strong communication and the value of using existing platforms to improve programme delivery.

### Background

Niger is a land-locked, low-income, food-insecure country in the Sahel that is highly exposed to climate change, ranking 187 out of 188 on the Human Development Index in 2016. Over two million people are food insecure and another 4.5 million are at risk of food insecurity, with millions more affected during the lean season. According to World Health Organization (WHO) classifications, Niger has a high global acute malnutrition (GAM) rate of 10% and very high stunting prevalence of 42% (WHO, 2018). An estimated 60% of school-age children in Niger do not

consume sufficient vitamin A, with high anaemia levels affecting 75% of children under five years of age and 46% of women of reproductive age (EDSN-MICS, 2012).

There are gender disparities in the education system in Niger. According to UNICEF, school enrolment rates are 70% for boys and 57% for girls at primary level and 14% for boys and 10% for girls at secondary level. Girls' access to education is limited by cultural practices, including responsibility for domestic chores and care for younger siblings, and structural factors, such as the scarcity of schools, resulting in long walking distances.

An estimated 76% of adolescent girls in Niger are married before age 18 and one in four girls are married before age 15; this is one of the highest rates of early marriage globally. Early marriage correlates with high rates of adolescent pregnancy (48% of adolescent girls in Niger have a child before age 18), associated in turn with increased risk of maternal mortality, still-birth, neonatal death, preterm birth and low birthweight (LBW) (EDSN-MICS, 2012).

### Rationale for intervention

Maternal health and nutrition make major contributions to child health and nutrition throughout the life cycle (Black et al, 2008; Victoria et al, 2008). A malnourished woman is more likely to give birth to an LBW infant, increasing the risks of wasting, stunting and child mortality and, in adulthood, chronic diseases such as diabetes and hypertension. This vulnerability is passed from mother to child, perpetuating the intergenerational cycle of malnutrition. Adolescent girls are at high risk of anaemia, due to chronic iron depletion during the menstrual cycle; anaemia during pregnancy substantially increases the risk of LBW and maternal mortality. Interventions that aim to reduce anaemia prevalence among adolescent girls can therefore help reduce maternal mortality, LBW, child malnutrition and child mortality.

Parental schooling has been associated with improved child nutrition outcomes, including the reduction of stunting (Ruel et al, 2013). Formal education is also protective for girls, reducing the risk of exposure to abuse, early marriage and early pregnancies. Malnutrition negatively impacts education through reduced school attendance and achievements and, at the national level, reduces contribution to development in terms of human capital (Victoria et al, 2008). Interventions that combine keeping adolescent girls in the education system and their improved nutritional status can address these issues simultaneously to help break intergenerational cycles of poverty and malnutrition.

### Designing and implementing the pilot

Between 2012 and 2015, the World Food Programme (WFP) Niger undertook a pilot project targeting vulnerable adolescent girls with a joint education and nutrition programme in Dogo, Gaffati and Koleram municipalities in Mirriah division of Zinder region, where school attendance was the lowest in the country. The project was implemented in 24 primary schools, reaching approximately 1,700 pupils in grades five and six (children aged 10 to 15 years); of whom 48% were girls, and in six secondary schools, reaching approximately 1,400 students; 30% of whom were girls.

Unlike most WFP school meal programmes, the pilot targeted both primary and secondary students to encourage school attendance and performance, while simultaneously improving student nutrition knowledge and status. Additionally, gender-sensitive themes, such as the

**Table 1** Anaemia prevalence at baseline and end of pilot project

	At the beginning (T0)		End of pilot (Tf)		P value
	Number of pupils	Prevalence of anaemia (%)	Number of pupils	Prevalence of anaemia (%)	
<b>Primary school pupils</b>					
Boys	287	63.1	287	59.9	<10 <sup>-4</sup>
Girls	289	63.3	290	57.9	<10 <sup>-4</sup>
Total	576	63.2	576	58.9	
P value		0.94		0.62	
<b>Secondary school students</b>					
Boys	343	43.1	308	34.4	<10 <sup>-4</sup>
Girls	257	35.0	255	40.8	<10 <sup>-4</sup>
Total	600	39.7	563	37.3	
P value		0.04		0.13	

importance of girls' education and dangers of early marriage, were discussed with both girls and boys. Children were encouraged to express their thoughts and ideas to improve confidence and self-esteem.

In collaboration with UNICEF, the nutrition component involved weekly iron and folic acid supplements for girls and boys in secondary schools during the entire school year from 2013 to 2015, according to WHO 2011 protocols (60 mg of elemental iron and 2.8 mg of folic acid once per week). For girls and boys in primary schools, daily meals were fortified using micronutrient powders (MNP). Deworming also occurred twice per year among primary school children, facilitated by the Ministry of Education.

The education component targeted girls in households categorised as poor and very poor using the household economy approach (HEA), with a monthly scholarship for two academic years (valued at USD7 per month) to facilitate and encourage school attendance. A total of 272 adolescent girls received the scholarship in the 2013-2014 academic year and 232 in 2014-2015. During the second year of the pilot, local committees were established to support and monitor the scholarship process in response to a recommendation from the mid-term review to improve girls' school performance. Sensitisation sessions were also held in schools and at the community level, focusing on girls' education, as well as essential family practices, hygiene, sanitation, nutrition and gender issues.

The total cost of the pilot phase was just under USD1.3 million, not including supplementation, which was in partnership with UNICEF.

### Results of the pilot phase

A significant reduction in anaemia prevalence was observed in targeted primary school children; from 63% to 58% for girls and 62% to 60% for boys. In secondary schools, anaemia rates among boys fell from 62% to 60% (see Table 1). Results also revealed that anaemia is predominantly mild<sup>1</sup> among affected boys and girls. No impact of iron and folic acid supplementation was ob-

served among secondary school girls; in fact, anaemia rates increased from 35.0 to 40.8%. The team hypothesise that this is due to the impact of the initiation of menstruation. Also, boys tend to purchase meat-based snacks, while girls are more likely to purchase non-food items, leading to poor consumption of iron-rich foods.

Improved school results were observed among targeted secondary school girls; the percentage of girls who passed their school year increased from 32% (2013-14) to 68% (2014-2015). The local committees, composed of community members familiar with the local context and the challenges faced by adolescent girls, proved crucial in improving the percentage of girls who passed their school year from mid-way through the project.

Dietary diversity improved significantly among boys and girls in primary schools (boys from 60.6% to 78.6% and girls from 60.9% to 82.1%) and secondary schools (boys from 66.1% to 84.2% and girls from 70.8 to 81.6%), with notable increases in the percentage of all groups achieving high dietary diversity. The consumption of iron-rich foods also increased across all groups (primary school girls 34.3% to 48.6%; primary school boys 33.8% to 80.8%; and secondary school boy: 35.9% to 55%), with the exception of secondary school girls, whose consumption remained stable (42.0% to 42.6%). A questionnaire administered to both control and intervention groups revealed that nutrition knowledge also improved among boys and girls in primary and secondary school.

Sanitation and hygiene practices, though already shown to be strong at baseline, were endorsed and sustained by the intervention.

### Scale-up and integration within the WFP Protracted Relief and Recovery Operation (PRRO)

WFP is currently implementing a protracted relief and recovery operation (PRRO) in Niger, aimed at strengthening household and com-

<sup>1</sup> Mild anaemia: Haemoglobin level for a child aged 5 to 11 years is 110-114 g/l and 110-119 g/l for children aged 12 to 15 years and above.



School girl in Simiri, Niger, 2017

munity resilience through a countrywide, integrated, multi-sector and multi-partner safety net and disaster risk reduction approach. The PRRO is led by the Government of Niger in partnership with WFP, UNICEF, the Food and Agriculture Organization (FAO), the International Fund for Agricultural Development (IFAD) and other non-government organisations (NGOs).

Initiated in 2014, this intervention is based on an integrated package of activities, targeting the most vulnerable households. The package aims to help households build their resilience by targeting the different members as follows: screening and treatment of malnutrition for children under two years of age and pregnant women; information education and communication (IEC) on nutrition, DD, sanitation and hygiene for the whole household; school feeding for school-aged children; cash transfers, conditional on participation in the creation of productive assets activities; and unconditional cash transfers during the lean season. It is implemented in all seven regions (37 municipalities) of Niger.

The pilot was successful in improving the school attendance and performance and self-esteem of girls, as well as acceptance of iron-folic acid supplementation by the adolescents and the community members and knowledge on DD. The lack of impact on secondary school girls' anaemia prevalence during the pilot indicated the need to increase the level of supplementation provided (in line with updated WHO recommendations) and provide more targeted sensitisation among girls to increase consumption of iron-rich foods and improve DD. A new cycle of the PRRO began in January 2017 which provided an opportunity to include an adapted and scaled-up version of the adolescent pilot project in the intervention strategy for all regions.

Adolescent girls between 10 and 19 years old from vulnerable households already receiving the integrated package of activities through the

PRRO now receive targeted additional support to improve their school attendance and nutrition. An estimated 13,130 adolescent girls have been targeted with education grants through the programme and 50,636 adolescent girls have been targeted with iron-folic acid supplementation (around 0.5% of the adolescent girl population in Niger). Due to resource constraints and the special nutritional needs of adolescent girls, adolescent boys are not included in the scaled-up programme. Fortification of primary school meals with MNP was also discontinued to align with the newly established national strategy for school meals, which centres on 'natural' fortification through food combinations and improved DD.

Unlike the pilot, which targeted adolescents in schools for supplementation, the scaled-up programme provides supplementation to *all* girls aged between 10 and 19 years in target households, whether the recipient is the child of the head of the household or the adolescent wife/mother. This adaptation in the targeting strategy helps to ensure that girls out of school are also reached with nutrition support. In the scaled-up programme, supplementation has been increased to *daily* iron and folic acid supplements<sup>2</sup> (containing 60mg iron and 400mcg folic acid), in line with updated WHO guidelines (WHO, 2016).

As in the pilot phase, girls receive a monthly scholarship of USD7 per month, intended to cover their basic needs and encourage them to pursue their studies. The scholarship is conditional on school attendance, which is monitored. Girls are supported by existing local committees, such as school management committees, parent-teacher associations, professors and local leaders, which ensure girls' attendance and investigate reasons for absence, including living and studying conditions.

Gender-sensitisation and awareness-raising activities have been continued in the PRRO at

the school and community levels, although these are now carried out by trained community animators rather than NGO staff to improve ownership and sustainability. Girls and boys, as well as community members, are sensitised on the importance and benefits of girls' education and the risks of early marriage and early pregnancies. Adolescents are also supported in the development of life skills and educated on goal-setting and financial management (new since the pilot), thus further building their confidence and empowerment.

Programme adherence will be measured at midline and end-line points of the PRRO<sup>3</sup>. Two indicators will measure any reduction in incidence of anaemia: proportion of adolescent 10-19 year-olds in targeted households who received iron-folic acid supplementation for three successive months, and anaemia prevalence, measured through the Demographic and Health survey (DHS) for 2017 and 2021 (regional/divisional DHS data will be examined). This activity is reinforced by nutrition education, with a specific focus on nutritional needs during adolescence, radio broadcasts and interpersonal communication at distribution sites. Sensitisation sessions are also held throughout the year in targeted primary and secondary schools.

### Challenges, lessons learned and the way forward

#### *Ensuring alignment with national policies and strategies is crucial for the uptake of the project and its sustainability*

The intervention is aligned with the National Policy on Nutrition Security (2016-2025) and the National Multi-Sector Plan for Youth and Adolescent Health (2017-2021). These key documents include planned interventions that aim to reduce anaemia prevalence during adolescence through the distribution of iron and folic acid supplements and through sensitisation and communication for behavioural change around diet and food habits, scheduled to begin in 2018. The distribution of scholarships to girls is aligned with the priorities of the Education and Training Sector Plan (2014-2024), which aims to close the gender gap in education and support retention of girls in school.

#### *Using established platforms and WFP presence helps new programme delivery*

The integration of adolescent support within the WFP PRRO integrated package of activities helped maximise impact, given that communities were familiar with and trusted WFP, and existing platforms could be used. For instance, the distribution of iron and folic acid supplements to adolescent girls is a new intervention in Niger and stakeholders expressed concern about girls attending the distribution sites. Strong communication between project supervisors and beneficiaries before the distribution to address these challenges ensured that 90% of eligible girls re-

<sup>2</sup> Containing 30-60mg of elemental iron.

<sup>3</sup> It was not feasible to conduct baseline data collection due to the reopening of schools.

ceived supplements during the 2017 lean season. Additionally, the distribution platform for general food distribution and screening and referral of malnourished children is now being used to distribute supplements, thereby reducing costs.

### *Interventions to target adolescents require the creation of an enabling education environment*

An enabling environment is necessary to deliver a school-based nutrition programme. For example, the sensitisation of teachers on related themes ensured their interest and participation in project activities, encouraging sustainability of programme impact within the school and throughout the wider community. In many schools in Niger, as in many developing countries with high population growth, there is a huge demand for teachers and a lack of resources for teacher training beyond a very basic level. This reduces the overall quality of education. The high number of students also creates pressure on infrastructure and school resources, often resulting in inadequate classrooms and lack of classroom and teaching materials.

To face these challenges, WFP Niger focuses its interventions in 'convergent municipalities' – areas identified as the most vulnerable by the Government of Niger and where the United Nations System and the humanitarian community are requested to concentrate their efforts. Harmonisation and integration of activities is ensured in these areas through investment in schools for more teachers, improvement of the school environment (through provision of toilets, refectories and water supply) and teaching resources, thus creating an enabling educational environment to maximise the impact of WFP's adolescent interventions.<sup>4</sup>

### *Effective communication throughout the project cycle is essential for smooth implementation*

During the pilot phase, several activities were implemented in schools by cooperating partners without the knowledge of the school authorities,

decentralised education services, district health service or local health facilities. At times, these authorities were unaware of the activities taking place under the programme, or even the programme itself. This led to poor engagement and insufficient monitoring of these activities by the decentralised authorities, which reduced their acceptance and ownership of the intervention. Cooperating partners should therefore communicate effectively with school administration and all relevant stakeholders at the district and local level before organising any activity to take place in the school facilities to ensure that the benefits are understood, participation is maximised, and disruptions to school activities are avoided.

### *Adopting multi-partner approaches helps to strengthen efficiency and effectiveness*

UNICEF was involved in design, implementation and monitoring during the pilot phase, as well as the design of the scaled-up programme, particularly the nutrition component (including supplementation) and communication strategy. Moving forward, WFP Niger plans to collaborate on programme implementation with various partners with complementary strengths, such as the UN Population Fund (UNFPA), the UN Entity for Gender Equality and the Empowerment of Women (UNWOMEN) and the UN Programme on HIV/AIDS (UNAIDS). Discussions are ongoing with these partners on the incorporation of HIV/AIDS awareness activities, gender awareness and adolescent-friendly areas in schools, and reproductive health activities.

### *Ensuring ownership at community, regional and national levels is key for project success*

The project established partnerships with the Government through the relevant ministries (i.e. education and health) and through the *Haut Commissariat à l'Initiative 3N (Les nigériens nourrissent les nigériens)*, also known as the *3N initiative*. These stakeholders participate in the steering committee that provides technical advice and supervision. The full involvement of gov-

ernment representatives at national, regional and community levels is imperative for the success of the project. During the pilot phase, despite the high involvement of the national Government, decentralised regional and local authorities were not sufficiently involved in the design, implementation and monitoring, which resulted in a lack of ownership. With the scale-up effort, the full engagement of government counterparts at all levels was ensured by a series of visits in each region of implementation by the national monitoring committee, which held bilateral meetings with the relevant regional stakeholders to collect feedback. Regional committees were then established, in charge of closer supervision of the activities; these committees visited the local authorities to ensure their full involvement.

## Conclusions

Good nutrition matters throughout the life cycle, but is especially important during the first 1,000 days of life when indisputable impacts on a child's growth, learning and future productivity can be obtained. Compensating later in life for deprivations during this period is difficult, but possible during adolescence. To help break the intergenerational cycle of malnutrition, an integrated set of multi-sector interventions targeted at adolescents, which includes education and nutrition programming, is needed.

Lessons learned from the WFP pilot have shown that the active participation of communities – adolescent boys and girls, women and men – at all stages of the programme, as well as close coordination with government and other partners to improve delivery platforms, can help to remove barriers posed by access and socio-cultural norms which influence the good nutrition of adolescent girls in Niger.

For more information please contact Benedict Tabiojong Mbeng at [benedict.tabiojongmbeng@wfp.org](mailto:benedict.tabiojongmbeng@wfp.org) or Mica Jenkins at [mica.jenkins@wfp.org](mailto:mica.jenkins@wfp.org)

<sup>4</sup> These activities began in September 2017, therefore no evaluation of their impact has yet been conducted.

## References

- Black, R, et al. *Maternal and child undernutrition: Global and regional exposures and health consequences*. *Lancet*. 2008;371:243-60.
- EDSN-MICS, 2102. Niger Demographic and Health Survey and Multiple Indicator Cluster Survey (EDSN-MICS) IV, 2012.
- Ruel, M, Alderman, H and the Maternal and Child Nutrition Study Group. *Nutrition-sensitive interventions and programs: How can they help accelerate progress in improving maternal and child nutrition?* *Lancet*. 2013;382(9891):536-551.
- Victoria, CG, et al. *Maternal and child undernutrition: consequences for adult health and human capital*. *Lancet*. 2008;371:340-57.
- WHO, 2016. *Guideline: Daily iron supplementation in adult women and adolescent girls*. Geneva: World Health Organization; 2016.
- WHO, 2018. *Global Database on Child Growth and Malnutrition*. Accessible at: [www.who.int/nutgrowthdb/about/introduction/en/index5.html](http://www.who.int/nutgrowthdb/about/introduction/en/index5.html).



A girl learning at school in Simiri, Niger, 2017



Analytical session in Red Sea State, Sudan

# Participatory, decentralised monitoring to improve quality of CMAM services in Sudan

By Mueni Mutunga, Rashid Abdulai, Mohammed Ali Elamin



Mueni Mutunga is a regional Nutrition Specialist in UNICEF East Asia and Pacific Region, responsible for the integration of severe acute malnutrition (SAM) management into health systems and nutrition in emergencies, resilience and climate change, and water, health and sanitation programming. Mueni was previously Chief of Nutrition for UNICEF Sudan.



Rashid Abdulai has worked with UNICEF for the past 11 years. He is currently Health and Nutrition Specialist at UNICEF Sudan responsible for provision of field support in health systems strengthening, treatment of SAM, infant and young child feeding (IYCF), nutrition in emergencies, and building monitoring systems.



Mohammed Ali Elamin has worked with UNICEF for the past seven years. He is currently a Nutrition Officer based in eastern Sudan, responsible for the management, implementation and monitoring of community-based management of acute malnutrition (CMAM) and IYCF programmes.

The authors would like to acknowledge the UNICEF Nutrition team and the Federal Ministry of Health (FMOH) in Sudan for the work described here and the preparation of this article.

The findings, interpretations and conclusions in this article are those of the authors. They do not necessarily represent the views of UNICEF, its executive directors, or the countries they represent and should not be attributed to them.

Location: *Sudan*

**What we know:** Community-based management of acute malnutrition (CMAM) programming requires a continuous cycle of monitoring, feedback and action to improve quality.

**What this article adds:** In Sudan UNICEF and the Ministry of Health (MoH) carry out nation-wide participatory, decentralised monitoring to track outpatient therapeutic programme (OTP) progress and improve coverage and quality. This involves five steps: defining state annual and quarterly targets; systematic data review and identification of low-performing states; engagement of implementing partners to identify low-performing CMAM sites and bottlenecks; development of joint action plans; and monthly review of progress. A case study is provided of Red Sea State, which showed slow progress on achieving targets in 2017 (by July 2017 only 6,837 children with severe acute malnutrition were admitted, 39% of the state annual target). OTPs were classified according to agreed criteria ('high' 8-12 children/month; 'average' 4-8 children/month; low <4 children per month), resulting in identification of 27 low-performing sites. Identified bottlenecks included inadequate staff; no staff incentives; low level of education/understanding of treatment protocol; no case-finding; low community acceptance; and scattered population. A resulting action plan included quarterly monitoring/mentoring by MoH/UNICEF at the 27 sites; monthly local monitoring meetings; screening by mothers and mother support groups of SAM children; and community mobilisation through community leaders. By the end of December 2017, 14,280 SAM children were admitted in Red Sea state, showing considerable improvement.

## Background

High levels of malnutrition were reported in the 2013 S3M (simple spatial surveying method) survey. This indicated the need for the scale-up of the community-based management of acute malnutrition (CMAM) programme, guided by a national scale-up plan (2015-2017) (Tewoldeberhan et al, 2017). Currently there are 1,110 outpatient therapeutic programmes (OTPs) and 125 stabilisation centres (SCs) in Sudan, which have treated nearly a quarter of million children annually since 2016.

Designing and implementing interventions in Sudan requires consideration of multiple, diverse and sometimes complex contexts, including: conflict-affected areas with limited access; population displacement; influxes of refugees (mainly from neighboring South Sudan); camp and host community settings; returning populations; scattered settlements; nomadic settlements; peri-urban settings; and indigenous populations in mountainous areas. Such diverse and challenging contexts provide challenges for CMAM programming, affecting access, coverage and quality of the programme. There is a need in this context for multi-layer monitoring to track progress of CMAM programmes, identify bottlenecks and provide timely, corrective actions.

## Participatory, decentralised monitoring methodology

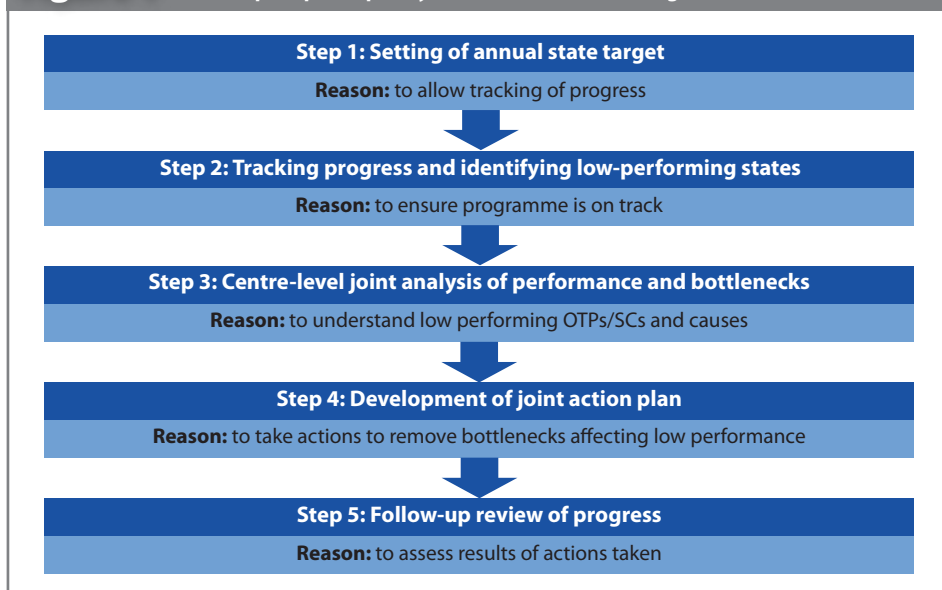
UNICEF collaborates with the Ministry of

Health (MoH) and non-governmental organisations (NGOs) at state and federal levels to carry out decentralised monitoring to track progress towards improved coverage and quality of the CMAM programme. The approach uses an inclusive, bottom-up approach, with strong participation of the state-level MoH and all partners working in the state, irrespective of whether they are UNICEF programme partners or not. Based on analysis of routine data, best practices for well performing facilities are noted and in poor performing facilities bottlenecks are identified and action plans developed with concrete activities to be implemented immediately for rapid improvement. The approach focuses on quick wins to get more children into the programme while systematically putting in place measures to address more resource-intensive bottlenecks.

This approach has yielded good results in the past two years, rapidly increasing admissions in previously poor performing CMAM sites and better positioning states to reach national admission targets. The approach has been used in seven states, including East Darfur, Central Darfur, South Darfur, Red Sea, South Kordofan, West Kordofan and North Kordofan, all of which were identified as low-performing and far off their annual targets. After implementing the approach, rapid catch-up was recorded.



**Figure 1** Five steps in participatory, decentralised monitoring of CMAM



Participatory, decentralised monitoring consist of five key steps: defining annual and quarterly targets for each state; tracking progress through systematic data review and identification of low-performing states; engagement of implementing partners in the low-performing states on a deep dive analysis to identify low-performing CMAM sites and bottlenecks causing low performance; development of joint action plans targeting the bottlenecks; and monthly review of progress after implementation of action plans (Figure 1). Each of these steps is described below.

**Step 1: Setting of annual state target**

Since 2016 UNICEF has committed to treating 250,000 children suffering SAM in Sudan annually, representing half the total burden. Each state has an agreed target that contributes to achieving the national target, based on the prevalence of malnutrition in that state. Annual state targets are further broken down into four quarters, based on the seasonal admission trends over the past three years. Some states have further broken their quarterly targets into monthly targets for admission. Such annual and quarterly targets allow the tracking of results and facilitate planning, including allocation of financial resources and supplies.

**Step 2: Tracking progress and identifying low-performing states**

Each month, each state collates and submits admission and performance data to the Federal Ministry of Health (FMoH), through which UNICEF receives summary data per state. On a quarterly basis, UNICEF and FMoH hold a joint review and sort states into ‘no risk’, ‘low risk’ and ‘high risk’, based on whether they have achieved their set quarterly admissions target and performance indicators for quality. FMoH also shares a list of low-performing localities with UNICEF. States that are deemed high risk are prioritised for participatory, decentralised monitoring. Feedback is shared with all states and implementing partners through UNICEF Field Offices.

**Step 3: Participatory analysis of performance by centre and identification of bottlenecks**

High-risk states first undergo a deep-dive analysis of performance and bottlenecks. UNICEF engages with each state MoH to plan for the participatory analysis, including agreement on timelines and mobilisation of participants, often including local-level nutritionists from both MoH and NGOs and state-level coordinators and managers. This is a rapid exercise, lasting not longer than one and a half days.

A decentralised analysis is performed in collaboration with the FMoH (which maintains the CMAM database) on trends of admission, cure, defaulter, death and non-respondent rates. This initial analysis shows the landscape of programme performance at state level, indicating which localities are reporting the highest or lowest admissions, which partners are performing relatively better and which months have the least admissions. Sphere standard indicators are also reviewed to give more context to the analysis.

Following this, a range of partners are engaged to develop context-specific benchmarks from which OTPs can be classified as having high or very high admissions, average admissions, or low or very low admissions, with links to state annual targets. This is a deviation from the previous simple approach of dividing the total annual target by total number of facilities, under which the vast majority of OTPs are likely to be classified as low-performing. Engagement with partners is a key part of this process; partners do not want their projects to be classified as low or average-performing, so discussions are often prolonged until multiple partners can reach agreement. The result is a minimum standard of performance for OTPs within the state.

Given that many OTPs function at minimum-acceptable standards, those that exceed these will compensate for facilities that fail to improve for genuine reasons. Due to different

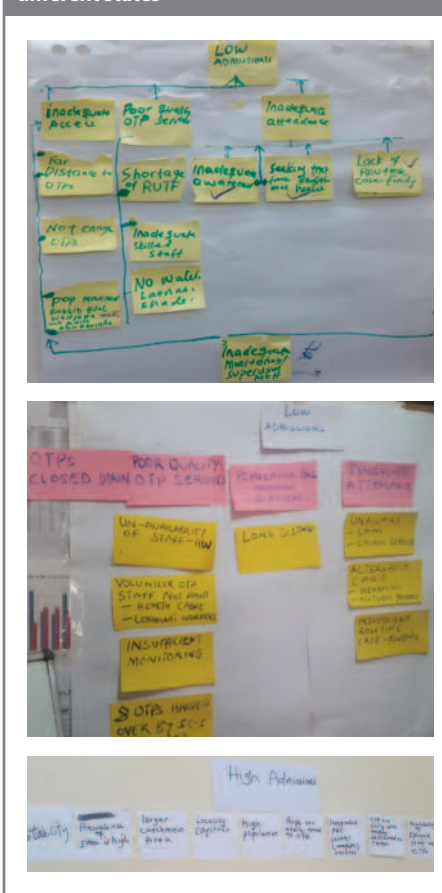
state characteristics – such as state targets, demography and number of OTPs – the expected number of admissions per OTP varies from state to state. OTPs classified as low-performing in very high-burden states may fall among the best-performing in low-burden states. Factors such as population movement and other demographic dynamics also impact on admissions. The benefit of this process is the uncovering of OTPs with low admissions (often those in remote areas) that would otherwise have been masked by high admissions in better-performing OTPs in those states showing good overall CMAM performance.

Following the admission analysis and classification of centres, a qualitative analysis is carried out to understand facilitators of high performance in facilities that perform very well and bottlenecks in facilities that do not. Local-level programme officers are invited to participate in this process, given their knowledge of the centres and valuable insights into the CMAM programme.

**Step 4: Development of joint action plans**

For each low-performing OTP, a plan of action is needed to improve performance and accelerate progress. These action plans are based on bottlenecks and facilitators identified and normally consist of activities that can be rapidly implemented within resource budgets and local capacities. Long-term actions and actions that require additional resources, such as staffing or scale-up of services, are addressed in a progressive manner alongside these more short-term, rapid

**Bottlenecks and facilitators identified in different states**



solutions, which provide initial motivation and quick results. The absence of such easier actions has often been the main cause of poor performance in the past.

Implementation often starts the week after the exercise to maintain momentum among implementing partners and state MoH staff. Where additional resources become necessary, UNICEF provides direct technical and financial support. Action plans are calibrated at local level to the extent possible so that as many centres as possible can benefit, whether by regular monthly feedback meetings among OTP staff, on the job training and mentoring, locality-wide mid-upper arm circumference (MUAC) screening, provision of drugs, redeployment of staff, or provision of other services (such as expanded programme on immunization (EPI), integrated management of childhood illness (IMCI) or reproductive health (RH)). Localities with a higher number of low-performing OTPs are prioritised over those with just one or two as it is more practical to address five low-performing OTPs in one locality than address five scattered in different localities.

Understaffing is a common longer-term bottleneck identified as a factor for low performance in OTPs that is not a simple problem to solve. In the past UNICEF has discussed the issue with state and federal MoH authorities and, while there have been instances where the FMoH national programme has deployed surge support to low-performing localities (such as in refugee response situations), or has temporarily redeployed staff from other localities or federal level, in many cases the issue remains. Poor access to remote populations is another common barrier identified. Where this is temporary, such as due to moving of communities to farmland areas, it is addressed through satellite and mobile clinics run by NGOs and sometimes with state MoHs (funded by UNICEF or FMoH when combined with EPI).

### Step 5: Follow up

After initiating implementation of the action plan, low-performing centres and localities are closely monitored monthly to track progress. This is important to ensure that actions are taken in a timely and effective way.

### Case study of Red Sea State

Red Sea State is in the east of Sudan, bordering the Red Sea, Eritrea and Egypt. The capital, Port Sudan, is a commercial city and the only sea port in Sudan. The MICS 2014 reported global acute malnutrition (GAM) and SAM as 14% and 2.3% respectively. The planning of SAM services in the state, as in all other states across Sudan, is based on the 2013 S3M report, which reported 20% GAM and 7.5% SAM for Red Sea. The National Baseline Household Survey 2009 also reported more than half of the state population as poor.

Under the leadership of the state MoH, CMAM has been successfully scaled up with limited resources and has achieved over 60% coverage, as reported by two successive coverage surveys in selected localities. There are currently

**Table 1** Classification of OTP performance in Red Sea, July 2017

Classification	Weekly admission	Monthly admission	Admissions by end of July
High	2-3 children per week	8-12 children per month	56-84 children
Average	1-2 children per week	4-8 children per month	28-55 children
Low	< 1 child per week	<4 children per month	<28 children

129 OTPs distributed across all nine localities in the state, treating more than 14,000 children annually since 2016.

By end of the first half of 2017, Red Sea was among the states identified to have difficulty in achieving annual targets. As a result, UNICEF supported state capacity through decentralised analysis, identification of low-performing sites and localities, bottleneck analysis and development of action plan for progress acceleration. The state MoH was fully engaged, providing access to the state CMAM database for analysis and coordinating and actively participating in the entire process. The steps in this process were:

### Step 1: Setting of annual state target

In 2017, 17,490 children suffering from SAM were targeted for treatment through the CMAM programme in Red Sea State. This target was set by the state MoH and partners and supported by UNICEF, based on SAM prevalence from the 2013 S3M.

### Step 2: Tracking progress and identifying low-performing states

Progress towards the target was quite slow in 2017; by the end of July 2017, only 6,837 were admitted, representing only 39% of the annual target. The coverage was also 777 fewer children than the previous year. Cure rates, defaulter rates and death rates were within SPHERE standards. UNICEF's technical team supported the nutrition team of the MoH with decentralised monitoring to accelerate progress.

### Step 3: Centre-level joint analysis of performance and bottlenecks

UNICEF, FMoH and local staff discussed and agreed on criteria for classification of OTP performance as high, average or low (see Table 1). This was informed by the total admissions for the state at the time, total number of OTPs, demographic factors (nomadic activity and seasonal migration from heat waves) and admission trends in previous years. Using this benchmark, UNICEF and MoH monitoring teams jointly analysed CMAM data.

Pivot tables (see Figure 1) were used to present performance and trends per CMAM site, locality and implementing partner. On flip charts, OTPs were grouped by performance according to the agreed criterion. For each OTP, participants who were familiar with the site gave detailed answers to the question, "Why is the OTP performance at the current level?". This qualitative analysis provided thorough insight to all OTPs on issues such as staffing, local government support, supplies shortages, community acceptance and capacity of primary healthcare. These discussions were facilitated by interactive tools such as visualisation in participatory planning (VIPP) cards or StickIt to bring out the real strengths and bottlenecks of OTPs, as opposed to programme reviews that provide generalisations. Summary characteristics of high- and low-performing sites in the Red Sea are provided in Box 1.

**Figure 1** Example of admission trends for Karary site, Nyala South, Jan-Sept 2017



#### Step 4: Development of joint action plan

From the deep-dive performance analysis and identification of facilitating factors and bottlenecks, an accelerated action plan was developed, tailored to accelerate the performance of low-performing OTPs in the Red Sea State (see Box 2).

#### Step 5: Follow-up review of progress

The action plan was implemented immediately by the state MoH nutrition team with support from the UNICEF team based in the Red Sea. The UNICEF Country Office in Khartoum provided regular follow-up to track progress in the implementation of the action plan. This follow-up support has proven critical to ensure that plans are not shelved but are implemented in a timely and systematic manner. Many of the actions have been institutionalised and implementation continued beyond 2017, including monthly local CMAM meetings, joint quarterly monitoring, on-the-job training and quarterly community mobilisation sessions.

#### Results

By the end of December 2017, 14,280 children suffering from SAM were admitted in Red Sea State. This was a remarkable improvement from the 6,837 admitted at the end of July. Seasonal distribution of SAM may have had some impact on the overall performance as the hunger gap starts in October and lasts until February in Red Sea State; however the implementation of the accelerated action plan was timely to address programme bottlenecks and enhance programme capacity to admit more children in need. Without such analysis and the actions taken, many children in need during the hunger season could have been missed.

Recognising the impact of this monitoring approach and learning from the exercise, the state MoH is now conducting the programme analysis on its own on a monthly basis, identifying low-performing sites and specific bottlenecks affecting programme coverage and quality. Besides increasing programme coverage, the decentralised monitoring approach improves staff skills (for example, through on-the-job training), provides ongoing staff motivation, and systematically improves the general capacity of the CMAM programme. The quarterly community engagement with key community leaders also sensitises communities about the signs and dangers of SAM and the availability of free CMAM services.

Similar results were achieved in the largely similar contexts of South Darfur, East Darfur (state MoH and NGOs established more OTPs due to distance barrier), South Kordofan, North Kordofan and

West Kordofan States. In newly accessible areas in Central Darfur (after cessation of conflict) a Find and Treat campaign was launched to admit a high number of un-reached children and 22 mobile OTPs were established to increase access.

#### Government ownership

The government has progressively taken on more responsibility in the implementation of CMAM in Sudan. The national CMAM plan was developed in line with the primary healthcare (PHC) expansion plan, which allows for gradual increase in government resource allocation in the same PHCs hosting CMAM services. Also demonstrating leadership and ownership, the government has fully funded nationwide mass MUAC screening to identify and treat more children, prioritising states with lowest coverage rates. In the past three years, the government has invested over US\$11 million on procurement of ready-to-use therapeutic food (RUTF).

It is important to acknowledge the particular achievement of CMAM scale-up in Sudan, given the low resource setting (in particular the huge under-resourcing of local health centres) and the fact that scale-up gains have been sustained for two consecutive years, with more children treated in 2017 than 2016.

#### Conclusions

The decentralised monitoring approach allows the use of local data to analyse local CMAM performance and catalyse action for improvement. The engagement of key stakeholders at state and local levels allows strategic contributions to programme performance by people who know the local context well and fosters accountability at all levels. Experiences in Sudan have shown that, while it is important to focus on comprehensive programme diagnosis and support, it is equally important to avoid developing a 'shopping list' of recommendations and instead focus on fewer doable actions (in a context of restricted resources) to generate enthusiasm for and commitment to achieving maximum results. At the same time, solutions must continue to be pursued for still unresolved, longer-term issues – such as poor staffing, staff incentives and irregular drug supply – to further drive up CMAM performance and improve sustainability.

For more information, please contact Mueni Mutunga at [mmutunga@unicef.org](mailto:mmutunga@unicef.org) or Rashid Abdulai at [rabdulai@unicef.org](mailto:rabdulai@unicef.org)

#### References

Daniel Tewoldeberhan, Tarig Mekkawi, Hanaa Garelnabi, Salwa Sorkti and Mueni Mutunga (2017). *Scaling up CMAM in protracted emergencies and low resource settings: experiences from Sudan*. Field Exchange 55, July 2017. p74. [www.ennonline.net/fex/55/cmamexperiencesudan](http://www.ennonline.net/fex/55/cmamexperiencesudan)

### Box 1 Summary characteristics of high- and low-performing centres in Red Sea

#### High-performing centres

1. Regular screening at community level
2. Highly experienced and committed staff
3. High acceptance by community members
4. Provision of integrated PHC services (than standalone OTPs)

#### Low-performing centres

1. Inadequately staffed
2. Centres run by volunteers without incentives
3. Low level of education and understanding of treatment protocol, in spite of several training sessions attended
4. Cadres seeking income from other activities, such as the port.
5. There is no form of case-finding
6. Low community acceptance
7. Scattered population and mountainous terrain
8. Frequent movement of population to other locations for agriculture and other income-generating activities
9. Irregular functioning of mobile OTPs (UNICEF fund only four localities)

### Box 2 Actions to improve performance of identified poor-performing OTPs

- 1) **MoH/UNICEF to conduct joint quarterly monitoring/mentoring (and on-the-job training) visits** to the 27 high-need OTPs in Sinkat, Haya, Ageeg, Haleib, Jabetalmaadin and Sawakin localities.
- 2) **Organise monthly locality-level meeting** for staffs of 27 high-need OTPs in the six localities to provide closer review of progress.

Locality	No. of OTPs
Sinkat	7
Haya	7
Ageeg	4
Halaib	3
Jabetalmaadin	3
Sawakin	3
Total	27

#### 3) Screening by mothers of SAM children

- Distribute MUAC tapes to all OTPs and facilitate provision to all attending mothers and orient them on how to take MUAC.
- Conduct weekly orientation to mothers of SAM children on how to measure MUAC and encourage them to screen children in their neighbourhood.

#### 4) Screening by mother support groups (MSGs)

- Distribute MUAC tapes to MSGs and conduct on-the-job training/refreshers on MUAC screening.
- MoH to encourage MSGs to conduct MUAC screening in their neighbourhood and refer those with SAM to the OTPs.

#### 5) Community mobilisation through key community leaders

1. Conduct quarterly community dialogue/sensitisation (nadwa) in OTP catchments targeting 25 key community comprising:
  - a. 3 OTP staff
  - b. 2 Sheikhs
  - c. 5 Shabab
  - d. 2 Women Union
  - e. 5 mothers of SAM children
  - f. 5 Community Volunteers
  - g. 1 Traditional healers/drug peddlers/tea sellers
  - h. 1 Local authority
  - i. 1 Imam

- 6) State MoH to prepare laminated letters of appreciation to OTPs that are performing very well in recognition of a job well done and to encourage them to continue good practices.



## The “ComPAS” trial combined treatment model for acute malnutrition: study protocol for the economic evaluation

Research snapshot<sup>1</sup>

Acute malnutrition is currently divided into severe (SAM) and moderate (MAM), based on level of wasting. SAM and MAM currently have separate treatment protocols and products, managed by separate international agencies. For SAM, the dose of treatment is allocated by the child's weight. A combined and simplified protocol for SAM and MAM, with a standardised dose of ready-to-use therapeutic food (RUTF), is being trialled for non-inferior recovery rates and may be more cost-effective than the current standard protocols for treating SAM and MAM.

This paper describes the protocol for the economic evaluation of the ComPAS trial, a cluster-randomised controlled, non-inferiority trial<sup>2</sup> that took place between May 2017 and

July 2018. It compared a novel combined protocol for treating uncomplicated acute malnutrition to the current standard protocol in children age 6 to 59 months in South Sudan and Kenya. This study will calculate the total economic costs of both protocols from a societal perspective, using accounting data, interviews and survey questionnaires. The incremental cost of implementing the combined protocol will be estimated and all costs and outcomes will be presented as a cost-consequence analysis. Incremental cost-effectiveness ratio will be calculated for primary and secondary outcome, if statistically significant.

The authors hypothesise that implementing the combined protocol will be cost-effective due to streamlined logistics at clinic level, reduced length of treatment (especially for MAM) and

reduced dosages of RUTF. The findings of this economic evaluation will be important for policy-makers, especially given the hypothesised non-inferiority of the main health outcomes. The publication of this protocol aims to improve rigour of conduct and transparency of data collection and analysis. It is also intended to promote inclusion of economic evaluation in other nutrition intervention studies, especially for MAM, and improve comparability with other studies.

<sup>1</sup> Leijveld N, Bailey J, Mayberry A et al. (2018). *The “Compass Trial” combined treatment model for acute malnutrition: study protocol for the economic evaluation*. *Trials* (2018) 19:252 <https://doi.org/10.1186/s13063-018-2594-7>

<sup>2</sup> It is expected that health outcomes will not be statistically significantly different between the intervention and control arms of the study.

## Risk factors for vitamin A and D deficiencies among children under five years old in Palestine

Research snapshot<sup>1</sup>

The Palestinian Ministry of Health (MoH) and UNICEF conducted a national cross-sectional survey in 2013 to ascertain the prevalence of and risk factors for vitamin A deficiency (VAD) and vitamin D deficiency (VDD) among children in the state of Palestine, uptake of a vitamin A and D supplementation programme, and whether variations of VAD and VDD were related to different approaches of health service providers. Risk factors for levels of vitamin A (n=1,054) and vitamin D

(n=150) were assessed among children aged 6 to 59 months using chi-square tests and logistic regression for each outcome. A child was considered to have VAD and VDD if he/she had a serum level <1.05 µmol/L and <50 nmol/L respectively. Multiple logistic regression models were developed to identify independent risk factors.

The prevalence of VAD and VDD was 73.1% and 60.7% respectively. Children in Gaza were 1.34 (95% CI 0.78–2.31) and 1.96 times (95%

CI 0.67–5.71) more likely to be deficient in vitamin A and D respectively compared to children in the West Bank. Anaemic children were 1.5 times more likely to be deficient in vitamin A (95% CI 1.08–2.10). Older children (> one year of age) were more likely to be deficient in vitamin D and females were 2.72 times more likely to be deficient than males (95% CI 1.21–6.01). Results suggest no association between maternal education levels, feeding practices and VAD and VDD. Although not statistically significant, children who received supplements from the MoH were more likely to have VAD and VDD than those receiving supplements from the United Nations Relief and Works Agency for Palestine Refugees (UNRWA). This may be explained by differing protocols; the UNRWA provides vitamin A capsules to children up to five years old (compared to up to 12 months by the MoH) and provides systematic counselling services to mothers of children under five years old to improve uptake (compared to no counselling by the MoH). The authors suggest that the MoH considers targeting at-risk children to increase adherence to the full supplementation regimen and that more research is carried out into effective methods of service delivery.

<sup>1</sup> Chaudhry A B, Hajat S, Rizkallah N and Abu-Rub A. (2018) *Risk factors for vitamin A and D deficiencies among children under-five in the state of Palestine*. *Conflict and Health* (2018) 12:13



Children play in Gaza, Occupied Palestinian Territory, 2014

## Effect of an emergency cash transfer programme on weight gain and acute malnutrition risk in Niger Research snapshot<sup>1</sup>

**A**ssessment of the impact of emergency cash transfer programmes on child nutritional status has been difficult to achieve due to the considerable logistic and ethical constraints that characterise humanitarian settings. A quasi-experimental longitudinal study was undertaken of a conditional emergency cash transfer programme implemented by Concern Worldwide in 2012 during a food crisis in Tahoua, Niger, in which the use of a concurrent control group permitted estimation of the programme's impact on child weight gain.

Programme beneficiaries received three transfers totalling approximately 65 per cent of Niger's gross national per capita income and mothers attended mandatory sessions on child and infant feeding and care practices. Dietary and anthropometric data from 211 vulnerable households and children targeted by the intervention were compared with 212 similarly vulnerable control households and children from the same 21 villages. Multi-level mixed effects regression was used to estimate changes in weight and weight-for-height z-

scores (WHZ) over time. Logistic regression was used to estimate the probability of acute malnutrition.

Results showed the intervention to be associated with a 1.27 kg greater overall weight gain ( $P < 0.001$ ) and a 1.82 greater overall gain in WHZ ( $P < 0.001$ ). The odds of having acute malnutrition at the end of the intervention were 25 times higher among children in the comparison group than those in households receiving cash ( $P < 0.001$ ).

The authors conclude that this emergency cash transfer programme promoted child weight gain and reduced the risk of acute malnutrition among children in the context of a food crisis. The authors suspect that the use of strategic conditional terms and a valuable transfer size were key features in achieving this result.

Future studies of this nature would benefit from pre-baseline measurements, more exhaustive data collection on household characteristics and transfer use, and further investigation into the use of conditional terms in emergency settings.



Beneficiaries of a WFP resilience programme in Takatsaba, Zinder, Niger, 2018

<sup>1</sup> Bliss J, Golden K, Bourahla L, Stoltzfus R and Pelletier D. (2018). An emergency cash transfer program promotes weight gain and reduces acute malnutrition risk among children 6-24 months old during a food crisis in Niger. *Journal of Global Health*. 2018 Jun;8(1):010410.

## Use and misuse of stunting as a measure of child health

Research snapshot<sup>1</sup>

**T**he term “stunting” has become pervasive in international nutrition and child health research, programme and policy circles. Although originally intended as a population-level statistical indicator of children's social and economic deprivation, the conventional anthropometric definition of stunting (height-for-age z score  $< -2SD$ ) is now widely used to define chronic malnutrition. Epidemiologists often portray stunting as a disease, making inferences about the causes of growth faltering based on comparisons between stunted (i.e. undernourished) and non-stunted children, and stunting is commonly used to monitor public health and nutrition programme effectiveness.

However, there is no biological basis for the  $-2SD$  cut-off to define stunting, making it a poor individual-level classifier of malnutrition or disease. In fact, in many low- and middle-income countries (LMICs), children above and

below the threshold are similarly affected by growth-limiting exposures. The authors of this paper argue that the common use of stunting as an indicator of child linear growth has contributed to unsubstantiated assumptions about the biological mechanisms underlying linear growth impairment in LMICs and has led to a systematic underestimation of the burden of linear growth deficits among children in low-resource settings. Moreover, because nutrition-specific, short-term public health interventions may result in relatively minor changes in child height, the use of stunting prevalence to monitor health or nutrition programme effectiveness may be inappropriate.

In commenting on this paper in his “Development Horizons” blog<sup>2</sup>, Lawrence Haddad emphasises that there is nothing inherently wrong with being short unless it is due to growth faltering; the key limitation of stunting as a summary indicator of lost human capital is that it ignores any growth faltering that occurs elsewhere along

the height-for-age distribution, not just  $< -2SD$  HAZ; hence the magnitude of the problem being understated using current definitions.

Lawrence suggests that we should look at mean and standard deviation of HAZ in addition to stunting and at the slope of change in HAZ by age. In countries with evidence of growth faltering, rightward shifts of the entire HAZ distribution will reflect positive improvement in growth of all children. In addition, programme investors must recognise that the prevention of growth faltering requires many factors over a significant time period and that the right programme indicators are those that are achievable but that have a clear path towards ultimate outcomes, such as improved growth.

<sup>1</sup> Nandita Perumal, Diego G Bassani and Daniel E Roth. (2018) *Use and misuse of stunting as a measure of child health*. The journal of nutrition, Volume 148, Issue 3, pp.311-315.

<sup>2</sup> [www.developmenthorizons.com/](http://www.developmenthorizons.com/)

## The consumption of animal-sourced foods by infants in low-income settings

Research snapshot

In his “Development Horizons” blog<sup>1</sup>, Lawrence Haddad writes about a new International Food Policy Research Institute (IFPRI) discussion paper<sup>2</sup> that pulls together data on the food intake of 112,553 children aged 6-23 months using Demographic and Health Survey (DHS) data across 46 low- and middle-income countries since 2006. Focusing on animal-sourced foods (ASF), the paper examines infant food intake variations across countries, associations with linear growth and the sensitivity of food intake to food prices. Results show distinctive patterns of ASF consumption among children in different regions; particularly highly variable patterns of dairy consumption, low consumption of eggs and meat and – surprisingly – frequent consumption

of fish in several poor regions of Africa and Asia. Multivariate models saturated with control variables demonstrate strong associations between child stunting and a generic ASF consumption indicator, as well as with fish and dairy consumption. The paper then explores why ASF consumption is low but also so variable, finding that non-tradeable ASFs (fresh milk and eggs) are a very expensive source of calories in low-income countries, and that caloric prices of these foods are strongly associated with children’s consumption patterns. The authors conclude that the strong influence of prices implies an important role for agricultural policies – in production, marketing and trade – to improve the accessibility and affordability of ASFs in poorer countries.

Lawrence emphasises the problem of sustainability revealed in this paper: how to make ASF cheaper for children in low-income countries without leaving those children with fewer natural assets to manage when they grow up. Families are currently hampered by the high price of ASFs and will sell these foods for income to buy other foods less rich in high-quality protein and micronutrients. In this high-price context, it is not easy to convince farming parents to forego income to feed their infants. He argues we need to bring the price of nutritious foods down in a sustainable way so that these foods will be eaten by those who need them most.

<sup>1</sup> [www.developmenthorizons.com/](http://www.developmenthorizons.com/)

<sup>2</sup> Headey DD, Hirvonen K and Hoddinott JF. 2017. *Animal sourced foods and child stunting*. IFPRI Discussion Paper 1695. Washington, D.C.: International Food Policy Research Institute (IFPRI). <http://ebrary.ifpri.org/cdm/ef/collection/p15738coll2/id/132232>

## Packaged foods: What role can they play in improving consumption of nutritious food?

Research snapshot

Lawrence Haddad recently attended a side event on packaged foods at the 2018 EAT forum in Stockholm, following which he wrote a blog about the experience (see [www.developmenthorizons.com](http://www.developmenthorizons.com)). Highlights of the blog are that average households in nearly all countries in the world acquire the majority of their food from markets, most of which are packaged foods; the market for which is growing in middle-income countries (and probably also in low-income countries). This presents both a business and nutrition opportunity. At the side meeting participants were introduced to four new packaged-food products with nutritious food aspirations from four companies, which they were then asked to score for health, social, environ-

mental and business dimensions. Products included a new Kellogg’s granola-type cereal called Force of Nature (with reduced sugar and all-recyclable packaging); a fruit smoothie (froosch) (containing only fruit, with fruit fibres giving it a smoothie feel); reformulated Nesquik cereal (with reduced sugar and salt); and ModuMax (a taste modulator from DSM that moderates negative organoleptic characteristics in foods reformulated to have reduced sugar and salt).

Lawrence reflected that some companies have made substantial changes to their products’ profiles (including lower sugar and higher fibre) over the last five to ten years, which are “not transformational in a big bang sense”. However, small but frequent and persistent

changes add up to big changes. Some companies are struggling with the question how much effort to put into reformulating existing core products versus introducing new ‘healthier’ products, which could upset customers and lead to lower sales. It may be that companies providing business-to-business products (like DSM’s ModuMax) will have a greater impact in helping the whole system change, given their large reach. Processed foods can provide nutrition, convenience, safety and affordability if those are the key design criteria guiding processing, but incentives for this are needed. Finally, businesses are clear that, to be a market success, more nutritious foods must be tastier than less nutritious variants, an idea that those of us in the public sector must also embrace.

## Children who are both wasted and stunted are also underweight and have a high risk of death

Research snapshot<sup>1</sup>

Wasting and stunting tend to be addressed as separate issues, despite evidence of common causality and the fact that children may suffer simultaneously from both conditions (WaSt). To answer outstanding questions about these children, a database of cross-sectional survey datasets (almost 1.8 million children) was analysed to determine the risks associated with WaSt, which children are most affected, and how best to reach them.

The analysis found that all children with WaSt were also underweight. Further investigation of the standards indicates that being <-2 z-scores weight-for-height (WHZ) and <-2

z-scores height-for-age (HAZ) translates to a maximum possible weight-for-age z-score (WAZ) of -2.35. The authors conclude that WaSt and “multiple anthropometric deficits” (i.e. being simultaneously wasted, stunted and underweight) are identical conditions. Therefore, as previous research indicates that mortality risk for “multiple anthropometric deficits” is high, the mortality risk for WaSt is high. The analysis also found that cases of WaSt can be detected with excellent sensitivity and good specificity using weight-for-age.

The authors conclude that routine reporting of the prevalence of WaSt should be encouraged and

that therapeutic feeding programmes should cover WaSt cases, given the high mortality risk associated with the condition. Investigation of the extent to which current services are reaching WaSt cases and into treatment effectiveness, duration of treatment and relapse after cure (where they are being reached) is required. This analysis also contributes to a growing body of evidence suggesting that the conditions of being wasted and being stunted are positively associated with each other.

<sup>1</sup> Myatt M, Khara T, Schoenbuchner S et al. *Children who are both wasted and stunted are also underweight and have a high risk of death: a descriptive epidemiology of multiple anthropometric deficits using data from 51 countries*. Archives of Public Health. 2018;76:28. doi:10.1186/s13690-018-0277-1.

## Study of the cost, cost-efficiency and cost-effectiveness of three cash-based interventions in Pakistan

Research snapshot<sup>1</sup>

Cash-based interventions (CBIs) are increasingly being used to deliver humanitarian assistance and there is growing interest in the cost-effectiveness of cash transfers for preventing undernutrition in emergency contexts. The objectives of this study were to assess the costs, cost-efficiency and cost-effectiveness in achieving nutrition outcomes of three CBIs in southern Pakistan: a 'double cash' (DC) transfer, a 'standard cash' (SC) transfer and a 'fresh food voucher' (FFV) transfer. Cash and FFVs were provided to poor households with children aged 6 to 48 months for six months in 2015. The SC and FFV interventions provided US\$14 per month and the DC provided US\$28 per month. Cost data were collected via institutional accounting records,

interviews, programme observation, document review and household survey. Cost-effectiveness was assessed as cost per case of wasting, stunting and disability-adjusted life year (DALY) averted.

Beneficiary costs were higher for the cash groups than the voucher group. Net total cost transfer ratios (TCTRs) were estimated as 1.82 for DC, 2.82 for SC and 2.73 for FFV. Yet, despite the higher operational costs, the FFV TCTR was lower than the SC TCTR when incorporating the participation cost to households, demonstrating the relevance of including beneficiary costs in cost-efficiency estimations. The DC intervention achieved a reduction in wasting, at US\$4,865 per case averted; neither the SC nor the FFV interventions reduced wasting. The cost per case of stunting averted was US\$1,290

for DC, US\$882 for SC and US\$883 for FFV. The cost per DALY averted was US\$641 for DC, US\$434 for SC and US\$563 for FFV without discounting or age weighting. These interventions are highly cost-effective by international thresholds. While it is debatable whether these resource requirements represent a feasible or sustainable investment given low health expenditures in Pakistan, the findings may provide justification for continuing Pakistan's investment in national social safety nets.

<sup>1</sup> Lani Trenouth, Timothy Colbourn, Bridget Fenn, Silke Pietzsch, Mark Myatt, Chloe Puett; *The cost of preventing undernutrition: cost, cost-efficiency and cost-effectiveness of three cash-based interventions on nutrition outcomes in Dadu, Pakistan, Health Policy and Planning*, Volume 33, Issue 6, 1 July 2018, Pages 743–754, <https://doi.org/10.1093/heapol/czy045>



Kindiaba, the community health worker looks for fever, Mali

B. Stevens/InImages/AAH

The following three research snapshots summarise three related published papers regarding quality of care, treatment outcomes and cost-effectiveness of uncomplicated SAM treatment delivered by community health workers (CHWs) in rural Mali.

By Eleanor Rogers, Karen Martínez, Jose Luis Alvarez Morán, Franck G. B. Alé, Pilar Charle, Saul Guerrero, Natalie Sessions and Chloe Puett

## Quality of care for treatment of uncomplicated severe acute malnutrition delivered by community health workers in Mali

Research snapshot<sup>1</sup>

This paper presents findings of a cross-sectional study undertaken to assess the technical competence (quality of care) of community health workers (CHWs) managing cases of uncomplicated severe acute malnutrition (SAM) in a community-based management of acute malnutrition (CMAM) pilot programme in rural Mali. During this pilot scheme 18 CHWs were trained and equipped to treat uncomplicated cases of SAM in the community through eight days of initial training, on-the-job training and supervision, and a refresher course at six months. The capacity of these CHWs was assessed in terms of their capacity to:

- evaluate, classify and treat cases of uncomplicated SAM;
- provide nutritional counselling to caretakers of children receiving treatment for SAM, malaria, pneumonia or diarrhoea;
- correctly refer cases of complicated SAM; and

d) demonstrate interpersonal skills in their interactions with caretakers and children.

The study was conducted by trained enumerators during November 2015. Five teams of two observers collected data over a two-week period, evaluating 17 CHWs in three communes in the region of Kita, southwest Mali. Observers were medical doctors or nurses with experience in malnutrition treatment protocols who had been trained on data collection over five days. Direct observations were made of the management of SAM by CHWs using checklists, rediagnosed cases admitted for treatment and reviewed admissions cards and registers. In total 125 SAM cases, assessed and treated by CHWs, were observed. Most children were correctly assessed for the presence of major clinical signs (cough, diarrhoea, fever and vomiting; 97.6%), and for the presence of danger signs (95.2%). Mid-upper arm circumference (MUAC) was correctly assessed in 96.8% of children and oedema

was correctly assessed in 78.4%. The composite indicator, which includes all essential tasks to provide high-quality treatment for SAM, was achieved in 79.5% of cases; i.e. the child was appropriately assessed for key indicators, correctly classified and treated, and received key counselling.

The authors conclude that well-trained and supervised CHWs are capable of managing cases of uncomplicated SAM. This strategy provides an opportunity to increase access to quality treatment in Mali for SAM cases. Further evidence is required to ensure that this level of care can be achieved at scale, with a reduced level of supervision by non-governmental organisation (NGO) partners.

<sup>1</sup> Alvarez Morán JL, Alé FGB, Rogers E, Guerrero S. Quality of care for treatment of uncomplicated severe acute malnutrition delivered by community health workers in a rural area of Mali. *Matern Child Nutr.* 2017; e12449. <https://doi.org/10.1111/mcn.12449>

# Effectiveness of treatment for severe acute malnutrition delivered by community health workers

Research snapshot<sup>1</sup>

In most health systems, Community Health Workers (CHWs) identify and screen for severe acute malnutrition (SAM) in the community. This study aimed to investigate the potential of integrating SAM identification and treatment delivered by CHWs as part of the integrated community case management (iCCM) package to improve the coverage of SAM treatment services. A multi-centre, randomised intervention study was conducted in Kita, Mali between February 2015 and February 2016. Treatment for uncomplicated SAM was provided in health facilities in the control area and by CHWs and health facilities in the intervention area. CHWs in both groups were initially trained for two weeks on iCCM and community-based management of acute malnutrition (CMAM) (as per national protocols); in the intervention group CHWs also received eight days initial training, supportive supervision by regional supervisors and a refresher course at six months. Clinical outcomes (cure, death and defaulter ratios), treatment coverage and quality of care were examined in both the control and intervention groups.

A total of 699 children under five years of age were admitted to the intervention group and 235 children to the control group. Comparability of the two groups was ensured by identifying key indicators in a baseline survey carried out prior to the intervention and 'matched pair' analysis was used to mitigate the lower sample

size in the control group. The intervention group reported cure ratios of 94.2% compared to 88.6% in the control group (risk ratio 1.07 [95% CI 1.01; 1.13]). Defaulter ratios were twice as high in the control group compared to the intervention group (10.8% vs 4.5%; RR 0.42 [95% CI 0.25; 0.71]). Differences in mortality ratios were not statistically significant (0.9% in the intervention group compared to 0.8% in the control group). Coverage rates in December 2015 were 86.7% in the intervention group compared to 41.6% in the control ( $p < 0.0001$ ).

Results suggest that CHWs can treat SAM in the community appropriately with minimal training. The authors conclude that allowing CHWs to treat SAM reduces defaulter ratios without compromising treatment outcomes and can improve access to treatment.

<sup>1</sup> Alvarez Morán JL, Alé FGB, Charle P, Sessions N, Doumbia S, Guerrero S. *The effectiveness of treatment for Severe Acute Malnutrition (SAM) delivered by community health workers compared to a traditional facility based model*. BMC Health Services Research (2018) 18:207 <https://doi.org/10.1186/s12913-018-2987-z>



Famakan Kiabou, the community health worker in Kourounan, checks the medical records of Samakoun, Mali

B. Stevens/Inages/AAH

# Cost-effectiveness of the treatment of uncomplicated severe acute malnutrition by community health workers in rural Mali

Research snapshot<sup>1</sup>

The Malian Nutrition Division of the Ministry of Health and Action Against Hunger tested the feasibility of integrating treatment of severe acute malnutrition (SAM) into the existing Integrated Community Case Management package delivered by community health workers (CHWs). The study assessed costs and cost-effectiveness of CHW-delivered care compared to outpatient facility-based care. Activity-based costing methods and a societal perspective were used to include all relevant costs incurred by institutions, beneficiaries and communities. The intervention and control arms enrolled different numbers of children, so a modelled scenario-sensitivity analysis was conducted to assess the cost-effectiveness of the two arms, assuming equal numbers of children enrolled.

In the base case, with unequal numbers of children in each arm, for CHW-delivered care the cost per child treated was 244 USD and cost per child recovered was 259 USD. Outpatient facility-based care was less cost-effective at 442 USD per child treated and 501 USD per child recovered. The conclusions of the analysis changed in the modelled scenario-sensitivity analysis, with outpatient facility-based care being marginally more cost-effective (cost per child treated was 188 USD, cost per child recovered was 214 USD), compared to CHW-delivered care. This suggests that achieving good coverage was a key factor influencing cost-effectiveness of CHWs delivering treatment for SAM in this setting. Per week of treatment, households receiving CHW-delivered care spent half of the time receiving treatment

and three times less money (primarily due to reduced transport costs) compared with those receiving treatment from the outpatient facility.

This study supports existing evidence that the delivery of treatment by CHWs is a cost-effective intervention, provided that good coverage is achieved. Further research is needed on the costs to government of implementing this strategy.

<sup>1</sup> Rogers E, Martínez E, Alvarez Morán JL, Franck Alé GB, Charle P, Guerrero S, and Puett C. *Cost-effectiveness of the treatment of uncomplicated severe acute malnutrition by community health workers compared to treatment provided at an outpatient facility in rural Mali*. Rogers et al. Human Resources for Health (2018) 16:12 <https://doi.org/10.1186/s12960-018-0273-0>





## Review of scale and drivers of persistent global acute malnutrition

Summary of research<sup>1</sup>



### Location: *Global*

**What we know:** The prevalence of global acute malnutrition (GAM) regularly exceeds the emergency threshold of >15% in protracted crises worldwide.

**What this article adds:** A study involving interviews with 25 key informants and a literature review was undertaken to determine the scale, drivers and analysis constraints of persistent GAM in protracted emergencies. GAM drivers are often unclear and a 'food-first' approach persists, despite GAM's cross-sectoral nature; the UNICEF conceptual framework requires elaboration to apply to protracted emergency contexts. The analysis of persistent GAM is hampered by a lack of comparable data on malnutrition, differences in data pre- and post- World Health Organization (WHO) 2006 growth standards, differences in body shape between populations, and lack of capacity and resources to use the most appropriate methodologies (such as nutrition causal analysis (NCA)). The prioritisation of severe acute malnutrition (SAM), 'siloe'd' sectors and short-term funding cycles create challenges in addressing persistent GAM. The authors recommend prevention as well as treatment in emergencies, nutrition-sensitive programming, better analysis of the root causes of persistent GAM and a greater 'learning culture' in this area.

In many protracted emergencies, the prevalence of global acute malnutrition (GAM) regularly exceed the World Health Organization (WHO) emergency threshold of >15%, despite ongoing humanitarian interventions. The widespread scale and long-lasting nature of 'persistent GAM' means it is a policy and programming priority. Drawing on 25 interviews with key informants (technical specialists working for international non-governmental organisations (INGOs), United Nations (UN) organisations, academics and donors) and a literature

review, this paper describes the scale and duration of the problem of persistent GAM, the perceived causal pathways, the methodological challenges in identifying trends and understanding drivers, and the implications for current practice, policies and future research.

Interviewees identified 25 countries where persistent GAM is widely recognised as an issue. The most frequently referenced were Somalia, Ethiopia and South Sudan. The Sahel belt and Horn of Africa were the two most consistently highlighted regions. South Asia, including India, Pakistan and Bangladesh, was also mentioned, indicating this problem is not limited to humanitarian contexts but is also evident in more stable development settings, despite wider global improvements in stunting and under-five mortality. Using available survey data, four case studies were developed in places consistently highlighted in the interviews and where GAM rates remain above 15%: Kanem Region, Chad; Cox's Bazar, Bangladesh; Northern Bahr-el-Ghazal, South Sudan; and Maradi and Zinder Districts, Niger.

Informants generally agreed that an understanding of the drivers of GAM must inform the design of interventions that address it. The UNICEF conceptual framework, "causes of malnutrition and death", remains the most well-known and widely adopted. In a protracted crisis, the drivers of persistent GAM are often unclear; in part because the three underlying

causes (food, care and health) all potentially play a role. However, a 'food-first' focus still tends to dominate thinking and practice in preventing malnutrition in acute emergencies, despite the recognised importance of public health in controlling disease and increasing awareness of care for children and women. Furthermore, evidence in protracted, persistent GAM settings indicates that food security may not be the main driver.

The UNICEF framework requires elaboration to understand the basic causes that apply in protracted emergency contexts, including potentially protracted war, conflict and insecurity; marginalisation; inequalities and poverty; governance of natural resources; and migration and displacement. Four cross-cutting themes emerged from the interviews that are not explicit in the UNICEF framework but are felt to be crucial in understanding persistent GAM: gender; livelihood systems; the history of vulnerability and long-term trends driving acute malnutrition; and seasonal fluctuations in acute malnutrition.

There are several methodological challenges in studying persistent GAM. First, there is limited availability of reliable and comparable data on acute malnutrition, across time and populations. Second, the switch from the National Center for Health Statistics (NCHS) anthropometric reference data to WHO growth standards in 2006 had implications for comparability over time. Specifically, important differences have been observed in the weight-for-height z-score (WHZ) cut-offs used for defining acute malnutrition between the two growth standards, with WHO standards resulting in higher prevalence estimates of SAM by 3% (Seal and Kerac, 2007). Another potential challenge is the slight differences in body shape that have been observed among children over two years of age from different populations, which associates longer-limbed body types with pastoralist populations in hotter, semi-arid environments. WHO guidelines do not address the possibility that physiological differences result in different malnutrition estimates in children and no clear guidance exists on how to correct for this.



Helen Young

<sup>1</sup> Young H and Marshak A. Persistent Global Acute Malnutrition. Boston: Feinstein International Center, Tufts University, 2017.

Various approaches are used for analysing the drivers of malnutrition, ranging from household surveys to qualitative approaches and mixed methods. While surveys can be used for testing correlations and regression analysis, a general lack of capacity and resources tends to limit this approach in practice. Both localised surveys and qualitative methods suffer in that results are not generalisable.

Recent methodological advances include a new participatory and response-oriented methodology known as Link-Nutrition Causal Analysis (NCA), which has now been applied in over 30 settings. Identified strengths of this approach are that it can bring together stakeholders, raise awareness and build consensus. However, the issue of response analysis and uptake of findings remains a challenge for all methodologies.

Addressing persistent GAM presents particular challenges for operational agencies, in part as a result of structural issues within the humanitarian system, such as the focus on treatment of severe acute malnutrition, 'siloe'd' sectors and

short-term funding cycles that do not include NCA or prioritise prevalence data.

The paper offers some potential strategies for moving forward. First, treatment and prevention should go hand-in-hand at all stages of an emergency; second, nutrition-sensitive programmes based on partnership, localisation and more participatory ways of working should be adopted as common practice; third, the root causes of persistent GAM linked with the wider political economy and protracted crisis should be more seriously analysed; fourth, a learning culture linked to research uptake and response analysis should be promoted.

This last point is linked to a proposed research agenda to strengthen the evidence base to guide programmes and policies. Important research gaps highlighted in this review relate to further analysis of wasting trends and, linked with this analysis, the relationship between wasting, stunting and mortality. A major area for future research is further investigations of specific pathways associated with wasting, including the

role of environmental enteropathy pathogens, the microbiota and the role of pre-existing nutritional status on child wasting.

The authors conclude that the challenge of persistent GAM is verging on a systemic crisis untouched by nutrition-specific programming, which calls for a radical reassessment of how we address nutrition in protracted crises.

References

Seal A and Kerac M. 2007. *Operational implications of using 2006 World Health Organization growth standards in nutrition programmes: Secondary data analysis*. *BMJ* 334 (7596): 733.

Other recent papers by Feinstein International Center include: Maxwell D, Stites E, Robillard SC, Wagner M. *Conflict and Resilience: A Synthesis of Feinstein International Center Work on Building Resilience and Protecting Livelihoods in Conflict-related Crises*. Boston: Feinstein International Center, Tufts University, 2017.

Catley, A. *Pathways to Resilience in Pastoralist Areas: A Synthesis of Research in the Horn of Africa*. Boston: Feinstein International Center, Tufts University, 2017. Available from: <http://fic.tufts.edu/publications/>

# Policy brief on engagement between public and private sectors for nutrition

Summary of research<sup>1</sup>



Location: *Global*

What we know: Worldwide 'nutrition transition', including in low-middle income countries is leading to increasing consumption of ultra-processed foods and unhealthy food choices associated with overweight and obesity.

What this article adds: A Global Panel Policy Brief examines the role of the private sector in shaping diets and provisioning consumer choice in food transformation and food retail, recognising that private sector activities typically focus on individual food products that meet consumer demand, rather than enhance diets. It examines opportunities for governments and stakeholders to use policy to provide incentives for companies to take decisions and risks in supplying nutritious foods and products and to provide an enabling environment that encourages innovation towards this. Public-private partnerships must be formed based on open dialogue and mutual trust, and must address questions in six areas: access to loans and credit for small-to-medium enterprises (SMEs); increasing consumer demand for high-quality and nutritious food products; price incentives to encourage companies to improve quality of food products; minimising risks for SMEs in developing and selling nutritious products; increasing transparency and accountability in engagements between government and the private sector; and improved infrastructure planning.

**D**iets are changing rapidly around the world. Some changes, such as improved supply and diversity of foods in low-income settings, have contributed to ongoing global reductions in under-nutrition. Other changes, such as rising availability and falling relative costs of ultra-processed foods, have led to unhealthy dietary choices associated with overweight and obesity. This shift in dietary

patterns, known as 'nutrition transition', coincides with economic development, demographic transition and changes in energy expenditure (i.e. more sedentary lifestyles). In recent decades, the nutrition transition has accelerated amongst LMICs, with a significant shift away from consumption of legumes and coarse grains to consumption of refined grains purchased at informal markets, modern supermarkets and convenience

stores, which have penetrated urban Africa and Asia and most of the Middle-East and Latin America (Monteiro and Cannon, 2012).

The private sector is involved in all segments of the food system, which encompasses agricultural production, harvesting, processing and packaging, food transformation, marketing and consumer access. It also plays a major role in influencing both the food environment and consumer preferences. In each, businesses can have both positive and negative effect on improving diet quality. A recent Global Panel Policy Brief examines the private sector's dominant role in shaping diets and provisioning consumer choice in food transformation and food retail. Its purpose is to stimulate governments and stakeholders to build strategies to incentivise the private sector to influence food systems to improve the food environment and enable better dietary choices.

Leaders in almost all LMICs today face a complex policy challenge of how to resolve per-

<sup>1</sup> Global Panel. 2018. *Improving diets in an era of food market transformation: Challenges and opportunities for engagement between the public and private sectors*. Policy Brief No. 11. London, UK: Global Panel on Agriculture and Food Systems for Nutrition. <http://glopan.org/sites/default/files/Downloads/GlobalPanelPrivateSectorBrief.pdf>

sisting undernutrition and micronutrient deficiencies while simultaneously preventing the global escalation of overweight and obesity. Urgent action is essential because healthy diets are key to addressing the growing health crisis, and poor-quality diets now threaten the achievement of the Sustainable Development Goals (SDGs). Some LMIC governments are stepping up their efforts to improve diets for all; for example, by focusing on improving consumer knowledge and shaping demand through price and trade policies. However, there are very few successful examples where governments have harnessed the market power of private sector actors to achieve positive gains in nutrition. This is a huge missed opportunity that must be rectified.

Policymakers must be realistic about their own limits in shaping consumer behaviour. Similarly, they need to be pragmatic in seeking to persuade industry partners to play a more active role in improving diets. The food industry already does much to meet the nutritional needs of a rapidly growing global population. However, its activities are typically focused on delivering individual food products, rather than on enhancing diets and larger food systems. There is profit in responding to current consumer demand for convenient, tasty, ultra-processed food products which do not contribute to a high-quality diet.

A policy focus is needed to encourage and enable firms to shift the balance of their activities in favour of products as well as fresh produce which are more nutritious, affordable and accessible to all. The key to this is to establish a common understanding of the critical role of diet quality in nutrition. Circumstances should then inform two broad classes of action: incentives – so that companies have confidence in taking decisions and risks associated with sourcing and supplying nutritious foods and products; and enabling measures – so that the business environment works to encourage rather than inhibit innovative approaches.

Regulation is a powerful tool at the disposal of policymakers for influencing food and beverage companies, although policymakers need to be

wary of potential negative side-effects. There are also opportunities and benefits for both public and private interests to move forward in partnership. Appropriate partnerships would enable firms to inform and help shape the design and implementation of policy actions. For this to take place, open dialogue is essential to building trust. The authors of this brief set out six key questions that need to be addressed and resolved as part of any new partnership approach. These are intended to be used as a basis to promote dialogue aimed at achieving more ambitious and effective links between public and private sectors, as follows:

**1. How can small and medium enterprises (SMEs) access loans to invest in food products which enhance dietary diversity and quality?** SMEs have a key role in improving diet quality and nutrition, but lack access to credit and sector-specific loans. Country-specific strategies to boost SME access to finance are needed.

**2. How can consumer demand for high-quality diets and nutritious food products be created and promoted so that companies have confidence to invest and take risks in delivering more nutritious foods?** Both public and private sectors need to step up and work together to find ways to increase access to affordable, high-quality diets and to enable consumers to make more nutritious food choices. Communication can also be a useful tool to increase knowledge and shift attitudes and cultural norms to produce changes in consumption behaviour.

**3. How should governments incentivise private companies to improve the quality of food products?** Price incentives implemented by governments could be used to counterbalance people's poor eating habits. For example, a cap-and-trade system, with 'credits' calculated according to nutritional and other characteristics of foods, could make nutritious food available at reasonable prices, and less nutritious foods available at higher prices.

**4. How can risks associated with developing, producing and selling more nutritious foods be minimised?** There are several potential risks for companies wishing to invest in research and development or retail of nutritious foods, such as failure to generate sufficient demand; fluctuations in economic conditions, commodity prices, interest and exchange rates; political risks; regulatory changes; and technology and operational risks. To encourage investment, suitable insurance products need to be designed and made available, particularly for SMEs in LMICs.

**5. How can governments ensure that engagement with for-profit companies to promote universal access to healthy diets is underpinned by core principles of transparency and accountability?** Currently, there is a significant lack of trust and transparency relating to food sector operations. The Access to Nutrition Index monitors this for major food and beverage companies, but additional mechanisms are needed which can cover other actors in the food system, such as farmers, entrepreneurs and local companies. There is also a need for better data collection and indicators of the outcomes of government efforts to create enabling environments that promote nutritious foods and which track businesses that want to drive better affordability and accessibility to healthy diets.

**6. How can infrastructure planning be better geared toward reducing food losses and promoting year-round access to enhanced diets?** One of the major constraints to higher-quality diets is unreliable or lacking supporting infrastructure, such as remote roads, electrical and water-grid networks. In low-income countries, where food loss is a major issue, investing in better infrastructure, particularly cooling and storage facilities, is paramount. Recognising that public funds for such projects may be limited in many countries, governments should encourage private investment and public-private partnerships.

The authors conclude that, while much of the problem of poor diets arises in the private domains of business and consumer choice, the 'costs' are mainly borne by society and public health budgets. Therefore, partnerships among governments, the food industry and consumers are essential going forward. It will be more profitable for industry and more cost-effective for governments to work together towards enabling better diets than to be in conflict over what must become common goals. Both sides must find ways to work together at a new and much more ambitious level in order to mitigate the enormous health burden associated with poor diets that already affect one in three of the global population.

References

Monteiro CA and Cannon G. 2012. *The Impact of Transnational "Big Food" Companies on the South: A View from Brazil.* PLoS Med. 2012;9(7):e1001252.



www.dipam.org

# A growth reference for MUAC-for-age among school age children and adolescents and validation for mortality

Summary of research<sup>1</sup>



A child's MUAC shows acute malnutrition, Kenya, 2017

Location: Kenya, Uganda and Zimbabwe

**What we know:** An internationally accepted reference for mid-upper arm circumference (MUAC) does not exist for school-age children and adolescents

**What this article adds:** Growth curves for mid-upper-arm circumference (MUAC)-for-age z-score for children age 5-19 years were constructed and evaluated against data from Uganda and Zimbabwe (ARROW trial) and Kenya to determine their discriminatory performance for subsequent mortality. The new growth curves transitioned smoothly with WHO growth standards at age five years. MUAC-for-age z-scores of  $-2$  to  $-3$  and less than  $-3$ , compared with  $-2$  or more, were associated with hazard ratios for death within one year of 3.63 and 11.1 respectively (ARROW participants); and 2.22 and 5.15 respectively (Kenya). The area under the receiver operating characteristic curves (AUC)s for MUAC-for-age and body mass index-for-age z-scores for discriminating subsequent mortality were 0.81 and 0.75 (ARROW) and 0.73 and 0.58 (Kenya). MUAC-for-age z-score is at least as effective as BMI-for-age z-score for assessing mortality risk associated with undernutrition among African children age 5-19 years.

## Introduction

The World Health Organization (WHO) recommends using body mass index (BMI) to assess malnutrition in school-age children, adolescents and adults. In 2007 WHO published growth references for weight, height and BMI for 5-19 year-olds; contrary to younger children, where MUAC is widely and increasingly used, MUAC was not included (WHO, 2007). A MUAC reference for US children and adolescents has

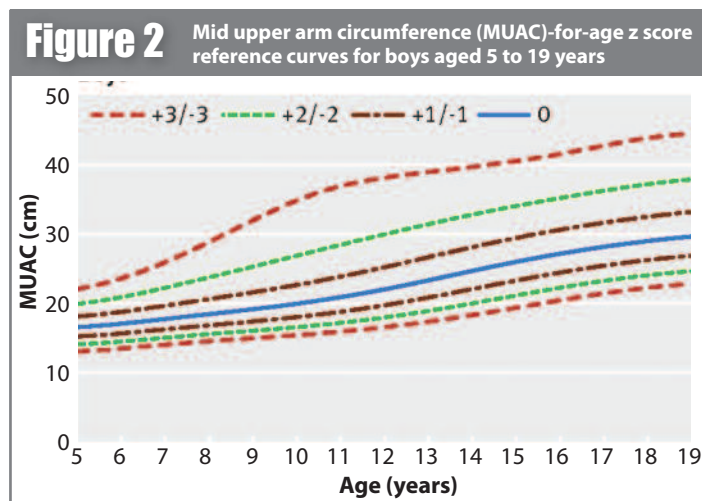
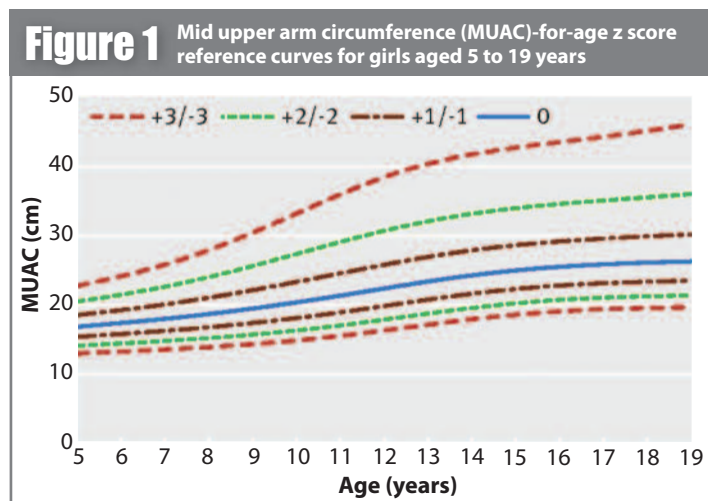
recently been published, but at age five years, z-score values from  $-3$  to  $3$  are between 0.6 cm and 2.6 cm higher than those of the 2006 WHO growth standards. There is currently therefore no internationally accepted reference, nor any studies that relate either MUAC or BMI to subsequent major health outcomes in this age group. The objective of this study was to construct growth curves for MUAC-for-age z-score for 5-19 year-olds that accord with WHO growth

standards and to evaluate their discriminatory performance for subsequent mortality through a longitudinal cohort study.

## Methods

The Health Examination Survey (HES)/National Health and Nutrition Examination Survey (NHANES) US population datasets (age 5-25 years), used to construct the 2007 WHO growth reference for body mass index (BMI) in this age group, were obtained. The HES cycles II and III and NHANES cycle I included data from 7119 children aged 6-11 years, 6768 children aged 12-17 years, and 23,808 people aged 1-74 years, respectively. For the HES datasets, all observations were initially included. For NHANES cycle I, observations from young people aged 5-25 years were included. These datasets were merged, giving a total number of observations from 20,953 individuals, then stratified by sex (10,639 females). Generalised additive models for location, scale and shape (GAMLSS) were fitted and measurements outside four standard deviations excluded. To achieve

<sup>1</sup> Mramba L, Ngari M, Mwangome M et al. (2017). A growth reference for mid upper arm circumference for age among school age children and adolescents, and validation for mortality: growth curve construction and longitudinal cohort study. *BMJ* 2017;358:j3423 | doi: 10.1136/bmj.j3423



a smooth transition with the WHO growth standards at age 60 months, the authors imputed normally distributed z-scores for 36,000 hypothetical individuals, randomly assigned by sex and age and uniformly distributed from 24-71 months, which were then merged with the cleaned HES/NHANES datasets. MUAC was modelled, stratified by sex, as a function of age by fitting GAMLSS models and testing different transformations, including Box-Cox-Power-Exponential, Box-Cox-t, and Box-Cox-Cole-Green models.

The discriminatory performance for subsequent mortality of the growth curves was evaluated, firstly using data from 685 HIV-infected children aged 5-17 years participating in the Antiretroviral Research for Watoto (ARROW) trial in Uganda and Zimbabwe between 2007 and 2008. MUAC, weight and height were measured at baseline and dates of death or loss to follow-up were recorded. Secondly, a dataset was used of 1,741 children aged 5-13 years discharged from a rural Kenyan hospital (3.8% HIV-infected) 2007-2012, where anthropometry was routinely undertaken and recorded at admission. Both cohorts were followed up for survival during one year. Using the 2007 WHO growth reference, MUAC-for-age z-scores were

calculated from the new growth reference and BMI-for-age z-scores. Hazard ratios for death were estimated using Cox proportional hazard models for predefined categories of MUAC-for-age and BMI-for-age z-scores. The proportions of children identified as malnourished by these MUAC-for-age and BMI-for-age thresholds were compared using a McNemar test. Multivariable models included age and sex (as well as HIV status for the Kenyan dataset, but not for the ARROW trial, as all children were HIV infected) as a priori potential confounders. To evaluate the predictive value of continuous MUAC-for-age and BMI-for-age z-scores, the area under the receiver operating characteristic curves were estimated for death within one year and differences in area under the curve (AUC) were tested.

### Results

Figures 1 and 2 show the new MUAC-for-age z-score growth curves by sex. The new growth curves transitioned smoothly with WHO growth standards at age five years. MUAC-for-age z-scores of -2 to -3 and less than -3, compared with -2 or more, were associated with hazard ratios for death within one year of 3.63 (95% confidence interval 0.90 to 14.7; P=0.07) and 11.1 (3.40 to 36.0; P<0.001), respectively, among ARROW trial participants; and 2.22 (1.01 to

4.9; P=0.04) and 5.15 (2.49 to 10.7; P<0.001), respectively, among Kenyan children after discharge from hospital. The AUCs for MUAC-for-age and BMI-for-age z-scores for discriminating subsequent mortality were 0.81 (95% confidence interval 0.70 to 0.92) and 0.75 (0.63 to 0.86) in the ARROW trial (absolute difference 0.06, 95% confidence interval -0.032 to 0.16; P=0.2) and 0.73 (0.65 to 0.80) and 0.58 (0.49 to 0.67), respectively, in Kenya (absolute difference in AUC 0.15, 0.07 to 0.23; P=0.0002).

Results confirm that a new growth reference for MUAC-for-age among school-age children and adolescents can be used alongside WHO growth standards and is a valid anthropometric marker of the risk of mortality in HIV-infected and uninfected populations in Africa. The authors conclude that, with its practical simplicity and availability of reference curves, MUAC can be used in place of BMI to assess communities and guide treatment for individuals at nutrition and HIV programmes and as a standardised means of assessment in research.

### References

WHO (2007) *Growth references for 5-19 years*. Available from: [www.who.int/growthref/en/](http://www.who.int/growthref/en/)

## Urban diets and nutrition: Trends, challenges and opportunities for policy action Summary of research<sup>1</sup>

Location: Global

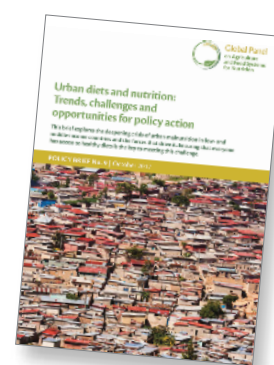
What we know: Urban populations are growing, particularly in Africa and Asia; all forms of malnutrition are now a pressing issue in urban areas.

What this article adds: This policy brief outlines four areas that policymakers need to pay attention to in order to improve urban diets and nutrition, including: governance in urban food systems (local leadership with fiscal devolution); cross-sector urban governance (including a nutrition-sensitive framework); greater value and support for the informal food sector; and tackling the triple burden of malnutrition in urban areas (underweight, micronutrient deficiencies and overweight/obesity). Eight recommendations are made to policymakers, including: prioritising urban diets as well as rural; local urban leadership to champion better diets and nutrition; capitalise on opportunities offered by the urban food system; connect with policy makers across sectors; address the needs of all diverse urban population groups; change attitudes around the informal food sector; give more attention to rising rates of obesity/ overweight; and review and disseminate data on what works. Finally, there is a need to act urgently, without delay.

Recent decades have seen unprecedented population growth in urban areas. In 2014, just over half the world's population lived in towns and cities. This is expected to rise to two thirds by 2050. Nearly 90% of these additional 2.5 billion urban residents will live in Africa and Asia. Malnutrition in all its forms is now a pressing issue in urban as well as rural areas; approximately one in three undernourished

children now live in urban settings and urban stunting rates in 13 countries are above 30% (IFPRI, 2016). The challenges facing urban policymakers are complex. Many urban environments are experiencing undernutrition, micronutrient deficiencies, and overweight and obesity (the so-called "triple burden" of malnutrition) simultaneously. In 2016, almost half of all overweight children under five years old lived in Asia and one quarter lived in

Africa. Urban populations tend to be very diverse and policies and programmes need to be tailored to take this into account, as well as the typical realities of urban living – such as



<sup>1</sup> Global Panel. 2017. *Urban diets and nutrition: Trends, challenges and opportunities for policy action*. Policy Brief No. 9. London, UK: Global Panel on Agriculture and Food Systems for Nutrition. <http://glopan.org/sites/default/files/Downloads/GlobalPanelUrbanizationPolicyBrief.pdf>



www.gfpan.org

lack of time and facilities for home cooking, pervasive food marketing and greater exposure to unhealthy foods.

The challenges facing urban policymakers are formidable, but the opportunities for positive change are equally impressive, considering relatively higher incomes of urban residents, and better access to fruits, vegetables and fresh foods, as well as more beneficially processed foods. Also, economies of scale and higher profit in integrated urban markets can make it easier for businesses to innovate, develop new marketing approaches and cross-subsidise products. Four priority areas are laid out in a recent policy brief addressing policies concerning urban diets and nutrition that are in particular need of change:

**Governance of urban food systems:** Local leadership and governance are essential in addressing the challenges of poor diets and nutrition in urban areas. Close connection is needed with the differing nutritional challenges of diverse urban populations (such as class, age, gender, ethnicity, religion and culture, for example) and a clear mandate is needed to deliver high-quality diets as a key policy objective. Without focused urban governance, other actors from a wide range of sectors are likely to dominate the food system, often in ways that are not pro-poor or focused on positive nutrition outcomes. To be effective, however, this must be accompanied by appropriate fiscal devolution so that local authorities have the resources to act.

**Wider aspects of urban governance:** This includes spatial planning (including urban form, land management and tenure security), infrastructure and housing, transport planning, education policy, access to energy, water and sanitation, and pre- and ante-natal policies and interventions. Policymakers must engage with partners and other actors, which seldom happens at present. A widely shared, cross-government, nutrition-sensitive policy framework is one way of helping to secure greater policy coherence.

**Policies relating to the informal retail sector:** A fundamental shift in attitude is needed whereby the value of the informal sector is better recognised and misconceptions are set aside.

**Triple burden of malnutrition:** Policymakers in many low- and middle-income countries (LMICs) are already encountering the triple

burden of malnutrition – underweight, micronutrient deficiencies and overweight and obesity – in urban populations. There are no quick fixes to address the challenge of overweight and obesity. Instead, national authorities and municipalities must develop a long-term strategy to limit future rises as a minimum.

While most actions will depend heavily on local contexts, the Global Panel offers eight recommendations to policymakers which are universally applicable to help governments to address all forms of malnutrition in urban areas:

1. **Policymakers need to urgently rebalance their efforts to make high-quality diets a priority for both urban and rural populations.** This means making fresh fruit and vegetables, pulses, nuts and seeds and other nutrient-rich foods available to all. Importantly, rising urban incomes will not provide the solution alone. High-quality diets are as important as clean water, hygiene and sanitation, good health services and maternal and child care.
2. **Policymakers at the local level need to take a leading role in championing better diets and nutrition – this requires them to be both mandated and empowered to act.** Local leadership is essential in addressing the challenges within cities. But there is also a need for multiple actors to work together to address the complex and growing problems. Government, business/market actors, education and healthcare providers and civil society all have important parts to play.
3. **It is essential to tackle the challenges of urban malnutrition by capitalising on opportunities offered by urban food systems.** Urban contexts provide a ready-made environment for influencing the diets and nutrition of large numbers of people. A high priority should be given to national policies which regulate product formulation, labelling, advertising and promotion. These are especially important in urban situations where food marketing can be particularly aggressive and can encourage poor-quality diets. Investment in the education of consumers about healthier food choices is also essential.

4. **There is a need to connect with wider areas of policy which are usually excluded from dialogues on urban diets and nutrition.** Cross-sector engagement is needed, as described above. There are also opportunities to influence public institutions in towns and cities, such as schools, prisons and government offices, to offer enhanced dietary choice, quality and knowledge about nutrition.

5. **It is essential to address the needs of all urban population groups. Populations within cities are diverse, covering a wide range of socio-economic levels, ages, ethnicities, cultures and religions.** Recognising this diversity is essential for the development of effective strategies which aim to achieve improved consumer access and dietary choice for all.

6. **Attitudes to the informal food sector need to change.** This sector is vital for meeting the dietary needs of many urban dwellers – particularly the urban poor. Rather than penalising or seeking to eliminate it, measures are needed to improve the sector in order to better address sanitation and health risks.

7. **Urban policymakers in low- and middle-income countries need to give more attention to the specific challenges associated with rising rates of overweight and obesity.** The aim should be to limit further rises – no country has yet succeeded in reversing the trend of rising obesity. If allowed to develop, the associated non-communicable diseases could become very burdensome for health resourcing, economic development and individuals.

8. **Effective action in tackling urban health and nutrition challenges needs to be carefully measured, rigorously analysed and quickly disseminated.** Reviewing and disseminating empirical data on what works – and what does not work – can help inform policymakers and promote a variety of tailored actions.

Finally, there is a need to act without delay. Urban populations are growing rapidly. Economic growth on its own is insufficient to secure improved diets and enhanced nutrition. Decisive action is needed to tackle the growing global health and nutrition crisis which is increasingly located in urban settings. Large concentrations of consumers with growing incomes offer a chance to change behaviour, choice and dietary patterns on a huge scale. A failure to act now risks locking in processes, behaviours and outcomes for decades.

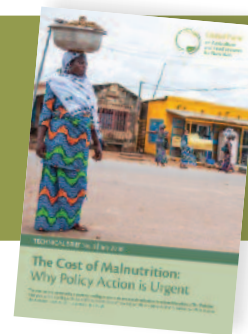
An editorial on this brief is available here: <https://foodtank.com/news/2018/06/urban-population-growth-malnutrition-cocktail/>

References

IFPRI. 2016. International Food Policy Research Institute *Global Nutrition Report 2016: From Promise to Impact: Ending Malnutrition by 2030*. Washington, DC.

# Technical brief on the cost of malnutrition

Summary of research<sup>1</sup>



Location: *Global*

**What we know:** Poor nutrition carries a significant economic burden at individual, national and global levels and prevents poverty reduction.

**What this article adds:** This technical brief presents a new conceptual framework that shows the link between malnutrition and economic costs through four main pathways: mortality, morbidity, impaired physical growth and impaired cognitive function. Through these pathways, malnutrition carries enormous direct and indirect costs to individuals, families and nations – US\$3.5 trillion globally. Increased investments in nutrition will bring impressive returns: an extra US\$7 billion per year would allow us to meet World Health Assembly (WHA) targets on stunting, anaemia and breastfeeding, saving 3.7 million child lives. Cost-effective interventions should be prioritised to see the greatest gains, including proven nutrition-specific and nutrition-sensitive actions and more effective nutrition governance. Policy recommendations include calculation of direct and indirect costs of malnutrition at national level, development of standardised metrics to strengthen communication with policy makers, development of a Common Results Framework and generation of rigorous data to assess cost-effective actions and urgently address evidence gaps.

**P**oor nutrition carries a significant economic burden for individuals and entire economies. It is estimated that undernutrition, micronutrient deficiencies and overweight at today's levels cost the global economy up to US\$3.5 trillion (FAO, 2013). This economic burden is a major impediment to government efforts to reduce poverty and to achieve targets such as the Sustainable Development Goals (SDGs). Choosing the right set of actions to resolve malnutrition requires good evidence of what works in policy terms. Policymakers should make decisions based on the known cost-effectiveness of immediate actions,

bearing in mind future accrued costs if appropriate actions are delayed. This technical brief demonstrates that the status quo carries serious economic implications. All policymakers, particularly those in economic planning and finance ministries, must draw on growing evidence of how poor nutrition impacts economic growth. Using a new conceptual framework, this brief illustrates the various pathways by which malnutrition carries fiscal and economic costs. The brief also outlines the impressive returns on investment associated with actions to improve food systems, diets and nutrition worldwide. Investments are needed in country-specific eco-

nomical analyses of the costs and benefits associated with an accelerated reduction in all forms of malnutrition, and in improvements in the quality and quantity of diets to support this goal.

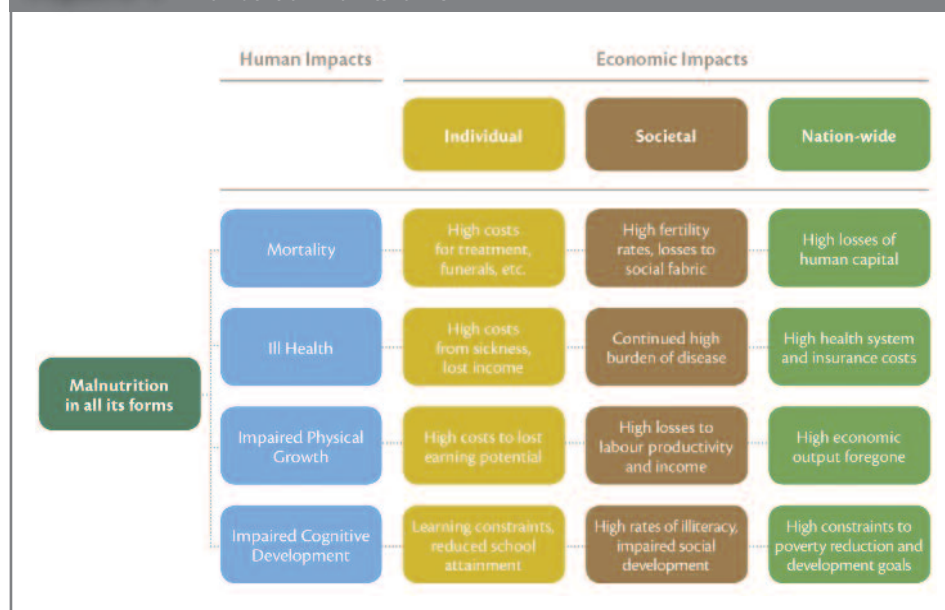
## Pathways from malnutrition to economic loss

As well as the direct costs to the global economy of US\$3.5 trillion, additional costs of malnutrition are borne by families, in the form of higher medical bills, lost income including due to illness, reduced school performance and later earnings due to cognitive impairment. The various health and other risks associated with various forms of malnutrition vary by gender, age and context. Unfortunately, few data are collected at such disaggregation, making it very difficult to determine the cost and effectiveness of actions for specific groups of individuals. This remains a data gap that should be urgently closed. At the national level, costs include the rising bill associated with disability payments, while losses are squarely tied to lost economic productivity. Within this brief, the authors have grouped these interactions into four pathways (described in Figure 1).

Firstly, the authors consider mortality. It is estimated that up to 45% of all preventable child deaths are attributable to undernutrition (Black et al, 2013). Severely undernourished children are up to nine times more likely to die than well-nourished children. Maternal mortality, linked to severe anaemia, and reduced adult life expectancy, linked to obesity and related health complications, are additional manifestations of nutrition-mortality linkages. Preventable mortality represents a loss of human capital that affects families and whole communities.

The second pathway considered is ill health. Treatment costs are borne by families as well as by health and insurance systems. For example, a full course of therapy to save the life of a severely wasted child costs between US\$100 and \$200 per child. In Ethiopia, the estimated national annual cost of undernutrition (treatment of 3 million underweight children) is US\$155 million, 90% of which is covered by families. At the same time, the per capita healthcare costs of treating obesity in the United States alone has been shown to be over 80% higher for severely or morbidly obese adults than for adults with a healthy weight. Focusing specifically on wasting,

**Figure 1** Conceptual framework for understanding the economic impacts of malnutrition in all its forms



<sup>1</sup> Global Panel. 2016. *The cost of malnutrition. Why policy action is urgent*. London, UK: Global Panel on Agriculture and Food Systems for Nutrition.



www.glopan.org

www.glopan.org

India's 45 to 50 million Disability Adjusted Life Years (DALYs) lost to wasting translate to economic losses of more than US\$48 billion in lifetime lost productivity (where one DALY is valued at US\$1,000).

Thirdly, the authors consider impaired physical growth. Sub-optimal physical growth, often coupled with life-long susceptibility to illnesses, reduces economic productivity through lowered labour productivity or absenteeism from work. The losses to individuals from undernutrition in low-income countries has been estimated as 10% or more of lifetime earnings. The cost to low-income nations of productivity foregone due to undernutrition has been estimated in Uganda as 5% of GDP and in Ethiopia 16.5% GDP. Similarly, in high-income settings like the United States, job absenteeism linked to obesity causes lost output equivalent to \$4.3 billion each year, costing employers US\$506 annually per obese worker.

The final pathway considered is impaired cognitive development. Poor nutrition from birth, continuing through school and adolescence, impairs cognitive development, delays school-attendance and reduces attainment, resulting in lost employment and socialisation opportunities throughout life. A multi-developing country study that explored the impact of impaired cognitive development on wages suggested that adults who were stunted as children receive almost 20% less in annual income than if they had not been stunted (Shultz, 2002).

### The Price of Investing in Good Nutrition – and the Rewards

The World Bank calculated that USD7 billion per year, in addition to existing resource allocations over the next ten years, would allow the world to reach global World Health Assembly (WHA) targets by 2025 for reducing stunting, anaemia in women, and increasing exclusive breastfeeding, while also better managing the impacts of wasting. Estimates indicate that this

would result in 3.7 million child lives saved, more than 65 million fewer children being stunted, and 265 million fewer women suffering from anaemia compared to 2015 (Shekar, 2015). The recent 'Cost of Hunger' analysis for 12 countries in Africa found that a halving of the prevalence rates of child stunting by 2025 would lead to savings of US\$3 million per year for Swaziland, to US\$133 million for Egypt and as high as US\$376 million in Ethiopia (FAO, 2014).

A recent study found that a 10% rise in GDP per person predicts an 11% decrease in extreme poverty (individuals living on US\$1.25 per day), but less than a 6% reduction in child stunting. For policymakers to achieve the goal of ending all forms of malnutrition will therefore require actions that go beyond macroeconomic growth and promoting sufficient household incomes that meet the basic needs, including access to health services, clean water, enhanced hygiene as well as women's empowerment. Investments in nutrition-sensitive social protection programmes also have the potential to improve nutrition and contain costs by strengthening household resilience.

Spending must be prioritised on cost-effective interventions to reduce undernutrition needed at scale, including universal salt iodisation, micronutrient supplementation (vitamin A, iron, folic acid and calcium), food fortification, promotion of exclusive breastfeeding and use of high-quality complementary foods, balanced energy protein supplementation of undernourished individuals and the treatment of severe and moderate wasting. The return on these investments would reduce wasting by 60% and stunting by 20%, resulting in returns to investment of the order of 18-to-1 on average across high-burden countries.

These activities must be complemented by action in other policy domains, including investments in agriculture, marketing and trade of food to limit post-harvest food losses, en-

gaging with the private sector to produce nutrient-rich, health food products and social protection and income-support for nutritionally vulnerable groups.

More effective governance for nutrition is also needed, such as establishing and supporting institutional and individual capacities and resources needed to promote good policies and ensure effective implementation of good programmes. A study by the Scaling Up Nutrition (SUN) Movement showed that the average annual cost associated with individualised plans for nutrition-specific interventions is estimated to be US\$200 million and for nutrition-sensitive actions US\$1496 million. Investments in nutrition governance mechanisms, typically involving information management and coordination, advocacy and communications and systems capacity-building, come to US\$114 million (SUN, 2014).

### Recommendations to policymakers

Based on these findings, the Global Panel recommends that:

1. Governments should calculate the direct and indirect cost of malnutrition in all its forms for their own country.
2. Standardised metrics must be developed to support more effective communication of findings to policymakers.
3. Viable options for policy and programme interventions across the food system must be identified and costed.
4. Establish a national Common Results Framework to shape the monitoring and reporting on progress.
5. Generate rigorous data to support ongoing assessment of cost-effective actions across the food system and food environment.
6. Urgently address knowledge gaps and data deficiencies on the costs and benefits of national investments in infrastructure enhancement; processing and food transformation; wholesale and retail incentives for delivery of affordable and desirable nutritious and healthy foods; and drivers of dietary choices and policy options for supporting better informed choice.

### References

Black R et al. *Maternal and child undernutrition and overweight in low income and middle-income countries*. The Lancet 2013. 382(9890): 427-451.

FAO 2013. Food and Agriculture Organization of the United Nations. *State of Food and Agriculture 2013: Food systems for better nutrition*. 2013 Rome, Italy.

FAO 2014. Food and Agriculture Organization of the United Nations. *Understanding the true cost of malnutrition*. 2014. [cited 27th April 2016]. Available at [www.fao.org/zhc/detailevents/en/c/238389/](http://www.fao.org/zhc/detailevents/en/c/238389/)

Schultz T. *Wage gains associated with height as a form of health human capital*. American Economic Review Papers and Proceedings 2002. 92, 349-353.

Shekar M et al. *Investing In Nutrition: The Foundation For Development and Investment Framework To Reach The Global Nutrition Targets*. 2015. Washington, USA.

SUN 2014. Scaling Up Nutrition. *Planning and costing for the acceleration of actions for nutrition: experiences of countries in the Movement for Scaling up Nutrition*. 2014. New York, USA.



# Feasibility of a milk matters initiative to enhance milk intake in children over six months of age in Somalia

By Fatmata Fatima Sesay, Dr Binyam Woldetsadik Gebru, Minh Tram Le, Dr Sayed Ezatullah Majeed, Patrick Codjia and Marjorie Volege

The authors would like to acknowledge the support of UNICEF ESARO, UNICEF Somalia, Save the Children ESARO and Somalia and the HSED Group Kenya in conducting this research.



Fatmata Fatima Sesay is a nutrition specialist with UNICEF Somalia, providing technical support for infant and young child feeding, micronutrients and resilience programming. She has over ten years' experience in nutrition and public health programming in both emergency and development contexts with UNICEF and non-governmental organisations.



Dr Binyam Woldetsadik Gebru is the Health and Nutrition for Save the Children Somalia/Somaliland. He previously worked in Nigeria, Rwanda, Somalia and the Democratic Republic of Congo in health and nutrition and leadership. He graduated as a medical doctor from Addis Ababa University and has an MSc in public health from the London School of Hygiene and Tropical Medicine.



Minh Tram Le is a Humanitarian Nutrition Adviser for Save the Children Eastern and Southern Africa Regional Office. She has worked for the past ten years with Save the Children and other organisations in the west Balkans region for European refugees and the migrant crisis, central and south Asia (Pakistan, Afghanistan, India) and West Africa.



Dr Sayed Ezatullah Majeed has worked with UNICEF since 2000 in different capacities in Afghanistan, Democratic People's Republic of Korea, Sudan, Eritrea and Sri Lanka. Since May 2014 he has been Chief of Nutrition in Somalia. He previously worked for the Ministry of Health Afghanistan and with NGOs in Afghanistan and Pakistan. He is a medical doctor with a Master's degree in strategic planning and a post-graduate diploma in nutrition.



Patrick Codjia is Chief of Nutrition for UNICEF Kenya. Prior to this he worked for UNICEF Eastern and Southern Africa Regional Office and UNICEF Country Offices in Malawi, Democratic Republic of Congo and Botswana on both development and emergency nutrition programmes and was involved in operational research in Burkina Faso.



Marjorie Volege is the Nutrition Specialist – Emergency for UNICEF, Eastern and Southern Africa (ESARO) regional office, providing technical support to 21 countries on nutrition in emergencies. She has over 12 years' experience in nutrition in both humanitarian and development contexts in Ethiopia, Kenya, South Sudan with UNICEF and other organisations.

The findings, interpretations and conclusions in this article are those of the authors. They do not necessarily represent the views of UNICEF, its executive directors, or the countries they represent and should not be attributed to them.

## Location: *Somalia*

What we know: Pastoralist communities rely heavily on meat and milk for nutrition; seasonal availability varies, which may impact on intake.

What this article adds: A feasibility study was carried out in Hiran region of Somalia in 2016 to determine the viability of a 'milk matters' intervention in pastoral communities to enhance nutritional intake of children aged 6-23 months before and during lean seasons. Key learning areas include: the need to enhance milk production and consumption through maximising production during the lean season, prioritise empowerment of women (as key decision-makers on household consumption and use) and investment in the rearing of goats. Multi-sector engagement is essential, coupled with behaviour change communication. The expected benefits go beyond nutrition to include improved livestock production systems, improved access to income and improved community resilience.

## Background

Countries in the Horn of Africa continue to face food security challenges<sup>1</sup>. Pastoral and agro-pastoral communities relying on subsistence crop farming and livestock rearing as main sources of livelihood are the most affected. The nutrition situation in Somalia is one of the worst in the world, with a global acute malnutrition (GAM) prevalence of over 15%, which rises to 30% in some locations (classified as critical). The causes of malnutrition in Somalia are multiple, including poor infant and young child feeding (IYCF) practices, untreated sickness, food insecurity, poor water and sanitation practices and conflict. A quarter of Somalia's population is pastoral, with nomadic habits and reliance on meat and milk as major diet components. Dietary diversity is generally poor, reflecting the inadequacy of food access and availability, especially micronutrient-rich foods.

A feasibility study was carried out in Hiran region of Somalia in 2016<sup>2</sup> to determine the viability of a 'milk matters' intervention in pastoral communities aimed at enhancing the nutritional intake of children aged 6-23 months before and during lean seasons. A recent learning paper, summarised in this article, builds on these findings by analysing household patterns in livestock management, milk production, access and utilisation, milk handling, market chain and feeding practices in order to inform the milk matters initiative to maximise impact. The study also provides valuable information on the overall suitability and risks of implementing the project. It is intended to empower nutrition programme implementers in designing priority actions for nutrition-sensitive, resilience-building programmes, as well as defining key areas of investments.

## Methods

Data were collected between March and August 2016<sup>2</sup> in three livelihood groups: pastoralists, agro-pastoralists and internally displaced persons (IDPs)/urban populations in Mataban and Beletwyene districts (where there are plans to implement the milk matters initiative in future, subject to the availability of funding). Twenty-eight key informant interviews were carried out with men and women in the communities, including leaders and milk traders. Sixteen focus group discussions were held with community members and 1,534 quantitative surveys were carried out with respondents from 767 households.

## Results

*Livelihoods and their management:* Pastoralists relied on livestock production as their main source of income. One third (32.7%) of pastoralist and all (100%) agro-pastoralist households reported that they had land access; 44% of urban population respondents reported that they had some land, albeit in places far from where they were settled. Of the sampled households, 72.4% had goats, 41.2% had cows, 44.6% had camels and 23.8% had sheep. Results showed seasonal variability, with greater herd sizes in wet compared to dry seasons

<sup>1</sup> East Africa food security Outlook January to June 2018, and July to September 2018 [www.fews.net/east-africa-](http://www.fews.net/east-africa-)

<sup>2</sup> <https://somalia.savethechildren.net/sites/somalia.savethechildren.net/files/library/MILK%20MATTERS%20FEASIBILITY%20STUDY%20%20FINAL.pdf>



A camel herder walks behind his herd near the town of Ainabo, Somalia, March 2017

© UNICEF / Kate Holt

(23% difference), and greater availability of fodder in the wet season (60.3%) compared to dry (42.9%). Livestock management was found to be a male responsibility, while decisions on milk use were predominantly made by females in consultation with males, as reported in 75% of the surveyed households. In total, 64.2% of women were responsible for milk handling, storage and transportation to selling points. Pastoralists migrated with their herds (mainly cows and camels) during drought or seasonal stresses, leaving goats behind for milking purposes (75.9%).

**Milk consumption:** Across all three livelihood groups, consumption of milk is high during the high production season and low during the low production; hence production of milk is the main barrier to milk consumption and utilisation, as reflected in Figure 1. During the wet season (Gu), milk consumption was higher and milk provided a major source of income. Households consumed 41.8% and 27.8% of produced milk in wet and dry (Jilal) seasons respectively. More than half (52.3%) of pastoralists had milk surplus during the wet season, consumed by children

under five years in 80% of households. In 71.2% of the households, milk was added to vegetables, potatoes, water or tea before feeding children. In households with no livestock, an average of 0.56 litres was purchased daily in wet seasons, of which 0.38 litres was consumed by children aged 6-59 months (68%), compared to 0.5 litres of milk purchased daily by households with no livestock in the dry season (no significant difference between volume of milk bought between the two seasons (P=0.547)). Figure 1 compares patterns of milk utilisation between each of the three groups (pastoralists, agro-pastoralists and urban dwellers) in both regions.

**Milk availability and management:** Low milk availability was perceived to contribute to the poor nutrition status of children in 27.7% of households across the livelihoods. Communities generally perceive the benefits of animal milk in the prevention of malnutrition. Knowledge on optimal breastfeeding and complementary feeding was low (37.7% and 33.1% respectively). In 47.3% of households, milk was boiled for consumption and traditional methods such as

cold-water storage (28.6%), repeated boiling (56%), fermentation and mixing with traditional herbs were used to preserve unconsumed milk. Restricted access to markets, insecurity, seasonal floods, limited marketing skills, poor storage facilities and seasonal availability were factors limiting milk markets. Most small-scale traders were women (97.6%). Only 4.9% of the milk traders were engaged in milk production. In Hiran region a lack of companies processing and preserving milk was cited as a problem. Other than fermentation (35.1%), there were no other known milk products in the region, showing a limitation in value addition.

**Key learning points**

*Livelihoods and their management*

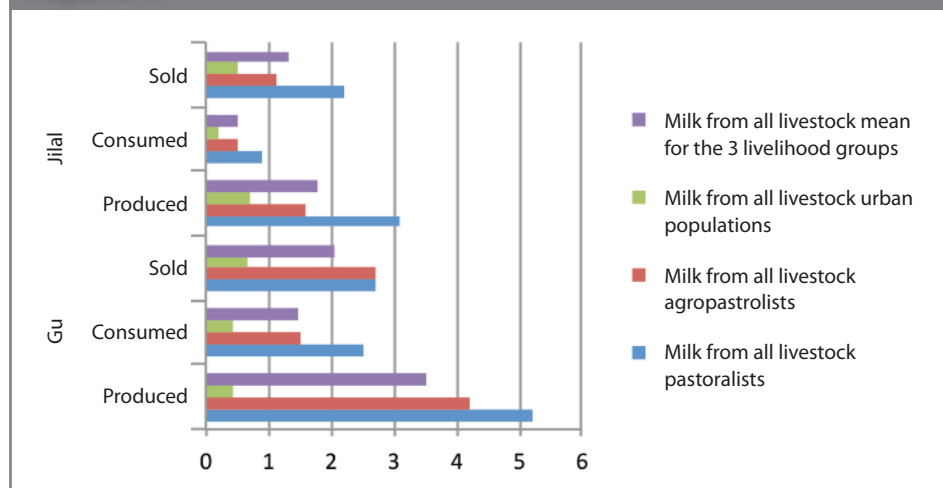
Results show good acceptability of milk among young children in pastoral and agro-pastoral communities and the use of milk to enhance household revenue; therefore investing in increased milk production and processing capabilities to ensure milk availability beyond the production season has the potential to increase milk consumption among young children and enhance household income. Advocacy is needed to reinforce multi-sector engagement – agriculture, water, sanitation and hygiene, health and nutrition – to enhance milk production and processing. Results show a clear preference for goats among pastoralists for both milk and meat, due to their relative affordability, taste of the meat and tolerance to drought and disease. Domestically, goats are also considered easier to keep at home by women due to their smaller size. Future programmes should therefore focus livestock investments on goats.

Women are the main decision-makers on milk utilisation in households; there is therefore great potential to mobilise women’s groups for the improvement of milk production and enhanced nutrition status among children. While the focus is on women, engagement of the men in the programme is required to provide supportive roles for sustainability. The mobilisation of community groups, including men, for fodder management, water management, rangeland and environment management is essential.

**Box 1** Proposed interventions

- Water availability
- Land use and fodder production
- Forage conservation/Crop residue management
- Fodder/Livestock health vouchers
- Supplementary feeding of livestock
- Breed improvement
- Balancing the livestock population and available feed resources
- Training of community animal health workers
- Improvements to the livestock and product marketing system through market linkages and infrastructure creation
- Trainings on milk hygiene practices
- Local supply of milk-handling equipment
- Nutrition education with a focus on optimal IYCF practices

**Figure 1** Milk utilisation in the household 24 hours before the survey



**Milk production**

The high consumption of milk in Gu is attributed to high milk production in the households, low prices of milk and limited markets due to over-production. Milk production should be maximised during dry seasons and milk preservation should be maximised during wet seasons to support continuity of use. Possible basic interventions could include fodder and water management, support to quality veterinary services, and promotion of appropriate nutrition and IYCF practices. Pilot and scale-up should focus on pastoral and agro-pastoral communities, where incidence of livestock ownership is high and traditional practices recognise the importance of milk in enhancing nutrition among children. Further research is needed to determine the impact of the milk consumption on nutrition status.

**Milk consumption by households and children**

Milk is perceived to be an important food in the prevention of malnutrition in children and is used to enrich complementary foods for infants. Behaviour change communication (BCC) is needed that focuses on sustained production and milk consumption across the seasons, alongside the promotion of optimal complementary feeding. The availability of milk in the households

does not seem to influence breastfeeding patterns among mothers; rather breastfeeding is influenced by socio-cultural practices. The feasibility study did not provide information on milk consumption specifically among children aged 6-23 months and monitoring of milk intake for this category should be considered.

**Milk availability and management**

The study noted poor hygiene practices in milk handling and preservation. Improving hygiene and safety practices should be prioritised, alongside other water and sanitation-related interventions, such as establishing water catchment dams and underground tanks for water harvesting and developing boreholes at strategic points to boosting milk production. Such interventions will help tackle some of the underlying causes of malnutrition. Investment is also needed in the surveillance of milk availability, including monitoring; analysis of supply, market availability and price could also contribute to enhancing decisions about milk management.

**Conclusion**

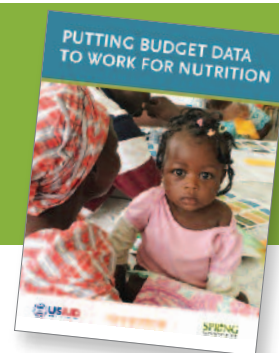
Focusing on milk production and processing during the wet season are effective strategies to address food access and improve child nutrition

intake in pastoral and agro-pastoral communities of Somalia. Key boosters to enhance milk production at household level are availability of pasture, land, water, animal breeds and veterinary services (see Box 1). The processing and optimisation of milk product availability beyond production time is also important and outlines the importance of food systems (supply of and demand for milk products) to enhance child nutrition intake and status in agro-pastoral areas, complemented by quality nutrition education on utilisation.

To maximise impact, milk matters interventions should aim to enhance milk production and processing during the wet season and should focus on building the capacity of communities in milk handling, increased production and preservation. Quality BCC strategies related to IYCF should also be implemented in conjunction. The expected benefits go beyond nutrition to include improved livestock production systems, improved access to income and improved community resilience.

For more information, please contact Marjorie Volege at [mvolege@unicef.org](mailto:mvolege@unicef.org)

**Putting budget data to work for nutrition** Summary of research<sup>1</sup>



**Location: Global**

**What we know:** There is a major global funding shortfall to meet malnutrition targets; accurate data on national nutrition budgets and spend is needed to inform decision-making and support accountability.

**What this article adds:** SPRING interviewed 25 key decision-makers in 11 countries to examine how budget data are currently used for decision-making at country level. Findings showed that data are used to identify and coordinate nutrition across sectors, advocate for more nutrition funding and track and manage use of funds. Analyses should be adapted to fit the country's needs involving an iterative, evolving and ideally regular and routine process. A range of stakeholders should be included to increase buy-in and findings should be targeted to specific audiences. Progress is being made at country level to analyse and nutrition budget and spending; however, it is essential that findings are shared with decision-makers and that they clearly identify gaps in spending and include district-level data to ensure that funding matches needs and translates into implementation.

**M**any actors have come together under the auspices of the Scaling Up Nutrition (SUN) Movement, the Millennium and Sustainable Development Goals (MDGs and SDGs) and other frameworks to address malnutrition. Achieving results requires adequate funding; however, estimates from the World Bank's Investing in Nutrition report suggest that the global com-

munity is seven billion dollars short of the funding necessary. Until recently, few nutrition actors could specify how much funding was allocated to nutrition. The lack of data on national nutrition budgets and spend meant that governments and implementing partners did not have accurate, up-to-date information on how nutrition was being prioritised or how well countries were spending their nutrition funds. The

SUN Movement, along with several donor-funded nutrition projects, have released guidance to help countries collect budget data and make an investment case. By the end of 2017, nearly 50 countries had analysed how much money had been budgeted for and some had gone further to track actual nutrition spending (Figure 1). To support this effort, SPRING gathered information and interviewed 25 key decision-makers in 11 countries, from ministry staff to local non-governmental organisations (NGOs), to learn more about country-level experiences using budget data for decision-making. These experiences were synthesised around three main questions.

**How are findings from nutrition budget and expenditure analysis used?**

First, nutrition budget and expenditure analysis served to identify and coordinate nutrition

<sup>1</sup> SPRING. 2018. *Putting Budget Data to Work for Nutrition*. Arlington, VA: Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project.

across sectors. By following the flow of funding, budget analysis helped to identify stakeholders not traditionally considered as having a nutrition interest. Working together to collect, analyse and review budget information also brought relevant stakeholders together and strengthened coordination structures.

Second, nutrition budget and expenditure analysis provided opportunity to advocate for more funding for nutrition. The process highlighted funding gaps and shortfalls in financial commitments and enabled comparison of spending with the amount being lost to poor nutrition, making a compelling case for increased nutrition funding. Seven out of 11 countries interviewed said that budget and/or expenditure data were useful for making an advocacy case for nutrition.

Third, nutrition budget and expenditure analysis was used to track and manage the use of nutrition funding. In some cases, a routine reporting system was instituted to allow the transparent tracking of resources, ensure commitments were fulfilled and verify that funding was used effectively.

### What lessons have countries learned about using nutrition budget analysis data?

Nutrition budget and expenditure analysis is a new initiative in many countries and many participants in the review shared lessons learned so far in the process, including:

*There is no one “right way” to use the data from nutrition budget and expenditure analysis*

*–data use should fit the country’s needs.* Several ways have been highlighted, as set out above, but many other uses for nutrition budget and expenditure analysis exist, depending on how policy is made, how budgets and expenditures are finalised, the reasons for the analysis and which stakeholders are involved.

*Financial analysis is often an iterative, evolving process and the availability and use of data often improves with each subsequent round of analysis.* Countries reported that regular data would be more effective for changing policy and influencing budgets over the longer term.

*Knowing when to use your findings is an important part of the process.* Budget and expenditure analysis is most effective for planning and advocacy when it is timed so that the results can be shared with decision-makers while the budgeting process is ongoing.

*Involving a range of stakeholders in budget analysis and dissemination broadens perspectives and increases buy-in and use of findings.* Although the budget analysis itself is often limited to a small group of stakeholders, sharing and discussing the findings is a chance to involve a wide range of actors, ensure that all data sources are used and engage civil society partners early in the process.

*Target the dissemination of findings, using language and evidence appropriate for each audience.* Initially, the goal of sharing analysis findings may simply be to raise awareness of the need for more detailed data about nutrition

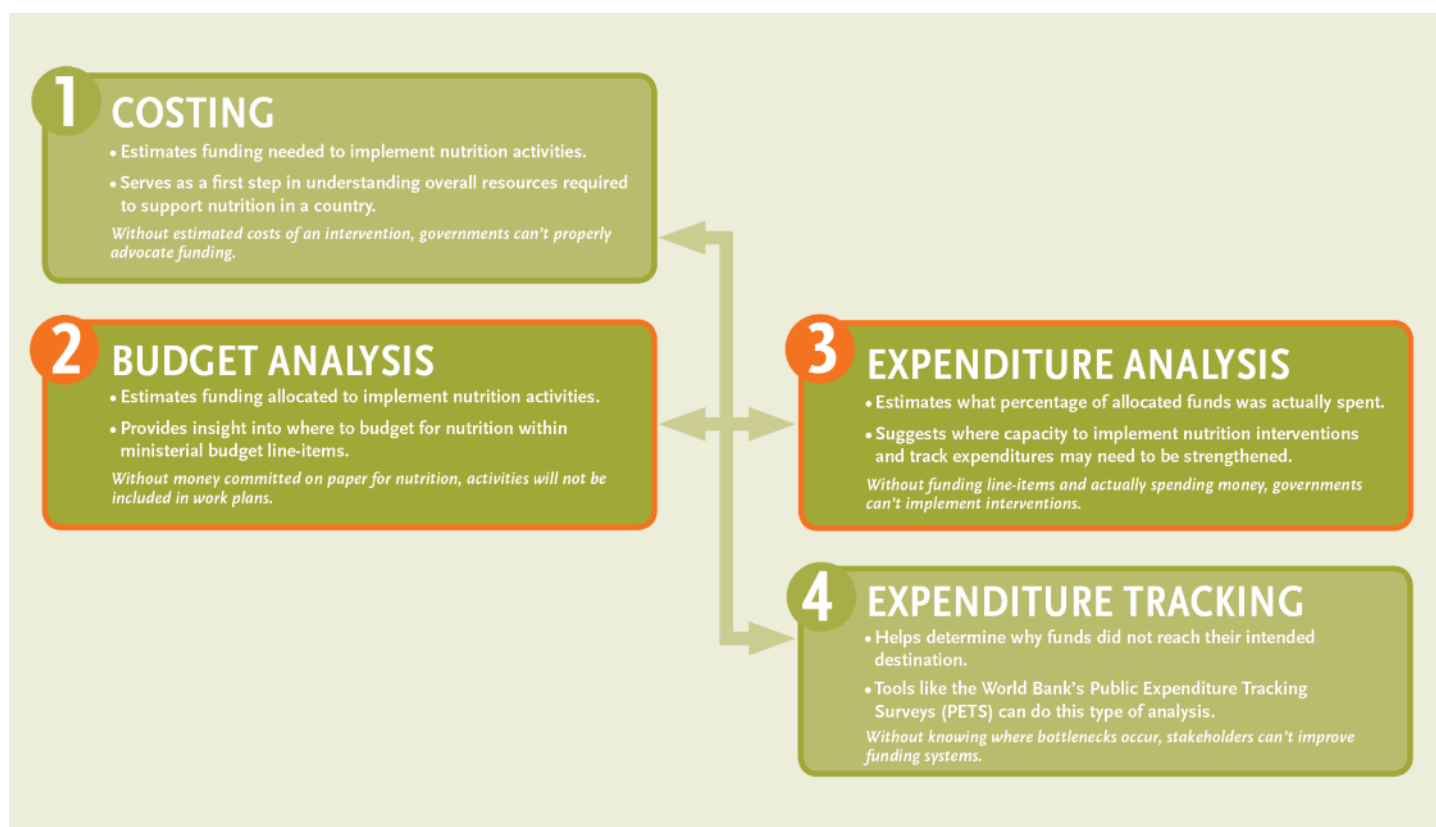
funding. There is a need to strengthen or disaggregate existing resource-tracking systems to allow for more accurate analyses in the future.

*Consider adopting systems to make monitoring and tracking routine.* Nutrition budget data can rarely be found within routine information or tracking systems, which slows the process and means that financial information cannot easily be linked to other routine nutrition monitoring data. Developing a system for nutrition resource-tracking can greatly facilitate the process of reporting, collecting, analysing and using nutrition budget and expenditure data.

### How can we improve use of data from nutrition budget and expenditure?

Budget and expenditure analysis can only affect funding allocations and expenditures for nutrition if the findings are used and convincingly shared with decision-makers. Estimates of nutrition funding and expenditures can have wide margins of error and often are not comparable to the estimated costs of activities. This makes it difficult to clearly define gaps in spending, which is needed to make a case for investing in nutrition. In addition, a lack of information on district-level budgets and expenditures makes it challenging to determine if funding and/or expenditures match local needs or translates into implementation. Nonetheless, these early estimates are a huge step forward in planning and advocating for nutrition funding and provide essential building blocks for future analysis of planned and actual nutrition spending.

**Figure 1** What is nutrition budget and expenditure analysis?





Jannati Mayna

Interview procedure being explained to the a mother, Barguna, Bangladesh, 2017

# Weekly menu for midday meal in Bangladeshi schools: Caregivers' choices

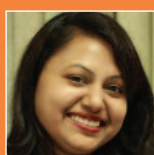
By Abu Ahmed Shamim, Jannaty Mayna, Ishrat Jahan, Syed Muntasir Ridwan and Rudaba Khondker



Abu Ahmed Shamim is the Nutrition Advisor (Consultant) at the Research and Evaluation Division of BRAC. He has previously managed nutrition programmes and research projects at the Bangladesh National Nutrition Council, CARE, Johns Hopkins University, FHI 360 and Helen Keller International.



Jannati Mayna has a Master's degree in Nutrition and Food Science from the Institute of Nutrition and Food Science, Dhaka University and is currently serving as a lecturer at the Khulna City Corporation (KCC) Women's College, Khulna, Bangladesh.



Dr. Ishrat Jahan studied dental surgery (BDS) and public health (MPH) from James Pitter Grant School of Public Health, BRAC University and is currently working as a researcher at the ARK Foundation, Dhaka, Bangladesh.



Syed Muntasir Ridwan works at the Global Alliance for Improved Nutrition (GAIN), conducting research in health economics, econometrics and behavioral economics.



Dr Rudaba Khondkar is the Country Director of GAIN, Bangladesh. She is a Medical Doctor with expertise in pediatrics and over 15 years' experience in humanitarian and development with Concern Worldwide, Save the Children, UNICEF and BRAC in Asia, Africa and the Pacific.

The authors wish to acknowledge the financial and technical support of GAIN, Bangladesh. However, the views expressed are the responsibility of the authors and do not necessarily reflect the view of GAIN.

The writers also acknowledge the insights provided by Dr. Mahbubur Rashed, Ex Head of Programme, GAIN, Bangladesh, and the support of the District Coordinator (Sherina Akther), *Shushilan* Barguna and the field-team of the School Meal Programme Bamna Barguna.

## Location: Bangladesh

**What we know:** School feeding programmes have the potential to improve child nutrition status, school attendance and achievements, and therefore to improve to future wellbeing and productivity.

**What this article adds:** In Bangladesh undernutrition is prevalent among schoolchildren as evidenced by indicators of underweight (42%), stunting (31%) and wasting (28%) in girls aged 5 to 10 years as well as deficiencies in iodine, vitamin A, iron, calcium and zinc. In a small cross-sectional survey, data were collected from mothers/caregivers in 71 households with children participating in an existing World Food Programme-supported pilot school midday meals (MDM) programme, versus 40 non-MDM households. Results revealed higher intakes of energy, calcium and vitamin A among MDM schoolchildren (although numbers are small and so should be interpreted with caution). Three focus group discussions with mothers/caregivers and local female vegetable growers (n=22) revealed perceptions of school meals as monotonous, with demand for a wider variety of nutritious foods. New menus were developed at the same/similar cost to provide approximately 30%, 39%, 30%, 56%, 43%, 32% and 14% of recommended daily allowance (RDA) for dietary energy, protein, fat, iron, zinc, vitamin A and calcium, respectively. These new menus now require field testing.

## Background

Early-life malnutrition is reported to have long-term consequences. Improvements in height-for-age in pre-schoolers are linked with increased height as young adults and increased number of school grades completed (Alderman et al, 2006). A recent review commissioned by the World Bank and World Food Programme (WFP) reported that school feeding programmes increase school attendance, cognition and educational achievement, particularly if supported by complementary actions such as deworming and micronutrient fortification or supplementation (Bundy et al, 2009).

In response to such evidence and prevalent undernutrition, the Government of Bangladesh (GoB) and WFP launched a school feeding programme (SFP) in 2002, through which fortified biscuits were distributed to primary schoolchildren in poverty prone areas of Bangladesh to improve child nutrition status. To complement this initiative, a partnership was formed in between GoB, Global Alliance for Improved Nutrition (GAIN) and Dubai Cares in 2011 to implement a pilot School Nutrition Project (SNP) in both rural and urban areas of Bangladesh to provide cooked midday meals (MDM) in primary schools.

A 'cluster kitchen model' was used whereby one basic kitchen provided a meal (often 'khichuri', made from rice, lentils or other pulses with added vegetables) to 1,500 to 2,500 students from five to six schools, using domestically produced and locally available ingre-

dients cooked on traditional stoves. This model reduced dependence on electricity and ensured quicker delivery of food (within 40 to 60 minutes) compared to a large, centralised kitchen; avoided the need to build kitchen extensions in schools; reduced costs per school of kitchen workers; and avoided disturbing schoolteachers from their primary duty of teaching. Research showed that the nutrition status of children in participating schools, as well as school enrolment and attendance rates, improved significantly (Afroze & Tukun, 2014). The WFP supported programme continues to run in selected areas of Bangladesh and the GoB is now formulating a national school feeding policy and a plan for scale-up. To inform this process, GAIN conducted the current study to develop an acceptable and cost-effective MDM menu, taking into consideration the menus from the pre-existing programme.

## Methods

A literature review was conducted to investigate the prevalence of undernutrition and micronutrient deficiencies of Bangladeshi primary school-age children. A pilot study that included a cross-sectional survey was then carried out among 111 mothers and caregivers in 71 pilot MDM households (of randomly selected students from a primary school in Bamna, sub-district of Borguna district, with the MDM programme) and 40 non-pilot households (of students from the nearest school from the adjacent sub-district with no MDM programme) to estimate energy, calcium and vitamin A intakes using the 24 hour-recall

method<sup>1</sup>. Three focus group discussions (FGDs) (with 22 participants in total) were conducted with groups of mothers and caregivers of students attending MDM schools and local female vegetable suppliers of the MDM programme to gather their opinions on alternative MDM menus within the same budget.

## Results

### Literature review findings

In Bangladesh prevalence of malnutrition is high; it is estimated that around 42% of school girls aged 5 to 10 years are underweight, 31% are stunted; and 28% are wasted, with a similar prevalence among boys (Akhtaruzzaman et al, 2013). Bangladesh has a high prevalence of iodine deficiency among school age children (40%) and vitamin A deficiency (19%). Although anaemia is prevalent in this age group (19.1% and 17.1 % in children aged 6-11 and 12-14 years respectively), prevalence of iron deficiency is not considered high (3.9% and 9.5 % in children aged 6-11 and 12-14 years respectively) (UNICEF, 2013). Daily intake of vitamin A, iron, calcium and zinc fall far short of daily recommended allowances for children (RDAs) at 20-47%, 35-48%, 50-77% and 36-60% respectively (Jahan & Hossain, 1998; UNICEF, 2013).

### Survey findings

Intakes of energy, calcium and vitamin A among schoolchildren in pilot MDM households were higher than in non-pilot households, although the differences were small (hence figures are not presented) and the result should be interpreted with caution due to the small number of children included in the study. Field findings also suggested that a typical home breakfast and lunch of a child provides about 28-32% of dietary energy in both pilot-MDM and non-MDM households.

When the mothers or caregivers of schoolchildren were asked about their opinion regarding the school meal currently being provided, 52% expressed dissatisfaction with the taste of the meal, while being satisfied with the amount

of food served and its nutritional quality. When asked about the benefits of the MDM, 44% of caregivers mentioned that it helped to reduce child hunger; 27% mentioned that it helped to reduce family costs; and 22% mentioned that it improved child health. Results revealed that 66 % of schoolchildren ate most of the meal provided, but 34% did not consume the meal regularly as they felt it was monotonous (100%) and not tasty (28%).

### FDG findings

There was agreement among all participants in FDGs that school meals in the existing MDM programme are monotonous. Almost all (96%) mothers and caregivers of schoolchildren suggested the inclusion of eggs in the school meal as affordable, nutritious and acceptable foods for children; 82% of mothers also suggested milk and 73% suggested vegetables. Other suggestions for alternative menus included boiled rice, fried or curried egg, smashed or fried potato, fried or curried fish, bread, banana and other seasonal fruits. They also suggested these items to be served alternatively with khichuri and biscuits to further avoid monotony.

### Reflections

Taken together, the findings from this pilot project suggest that the menu provided at school should be at least equal to a typical lunch or breakfast that a child receives at home (~30% of dietary energy). Otherwise if a school meal replaced a typical home meal, it can plausibly be assumed that the overall nutrient intake could be lower. The exercise also revealed that the menu should be nutritious, tasty, varied and acceptable to the children to increase uptake. Results also show that mothers and workers implementing school meal programmes may provide valuable insight in planning menus.

### Revised menu plans

Based on these results two weekly rotational menus were developed; one at the same cost as the existing programme and the second at a 15% additional cost (shown in Table 2). This

menu would provide approximately 30%, 39%, 30%, 56%, 43%, 32% and 14% of RDA for dietary

## Conclusion and recommendations

Alternative healthy menus are proposed for school lunches in Bangladesh, based on the results of a literature review and field study in the context of a pilot school meals programme. The GAIN meal-based school feeding project generated valuable learning which should be used in the process of planning the future national school meals policy and programme, such as the use of the cluster kitchen model. The field survey covered too small a sample size to measure statistically significant differences, but provided insights that complemented interviews and FDGs with caregivers and mothers. These indicated the need to create more varied and acceptable meals to increase uptake. The new menus identified through this pilot project can be plausibly expected to be more acceptable to children and consequently more effective in increasing child nutritional status. Findings must now be field tested before implementation at scale.

For more information, please contact Abu Ahmed Shamim at aashamim@gmail.com

<sup>1</sup> Iodine, zinc and iron intake from iodized salt and iron- and zinc-fortified rice were not estimated.

<sup>2</sup> Shaheen, 20013

<sup>3</sup> Bangladeshi Taka (BDT); \$1= BDT 8 (Department of Agricultural Marketing (www.dam.gov.bd/); accessed 15 June 2017)

<sup>4</sup> Locally and seasonally available mixed vegetables (including 50% leafy vegetables)

<sup>5</sup> Reconstituted from whole milk powder/locally collected cow's milk

<sup>6</sup> Calculated from Food and Agriculture Organization & World Health Organization, 2005; WHO, 2007; and Otten et al, 2006 (6 days a week)

<sup>7</sup> Upper values were used for calculation.

## References

Afroze R & Tukun AB. (2014). *Evaluation of school nutrition programme of BRAC and Banchte Shekha: Learning from a pilot project*. BRAC Education.

Akhtaruzzaman M, Khan MNI & Islam SN. (2013). *Nutrition, health and demographic survey of Bangladesh 2011*. Dhaka: Institute of Nutrition and Food Science University of Dhaka.

Alderman H, Hoddinott J & Kinsey B. (2006). *Long-term consequences of early childhood malnutrition*. Oxford economic papers, 58(3), 450-474.

Bundy D, Burbano C, Grosh ME, Gelli A, Juke M and Lesley D. *Rethinking school feeding: social safety nets, child development, and the education sector*. World Bank, 2009.

Food and Agriculture Organization & World Health Organization. (2005). *Vitamin and mineral requirements in human nutrition*.

Jahan K & Hossain M (1998). *Nature and Extent of Malnutrition in Bangladesh*. Bangladesh National Nutrition Survey 1995-1996, Dhaka, Bangladesh. Dhaka: Institute of Nutrition and Food Science, University of Dhaka.

Otten JJ, Hellwig JP & Meyers LD (Eds). (2006). *Dietary reference intakes: the essential guide to nutrient requirements*. National Academies Press.

Shaheen N. (2013). Food composition tables for Bangladesh. Final Research Results, 187.

UNICEF (2013). National Micronutrient Status Survey.

World Health Organization (WHO) & United Nations University. (2007). *Protein and amino acid requirements in human nutrition* (Vol. 935). World Health Organization.

**Table 1** Proposed menus for MDM programme

Days	Items	Evidence strength	Energy <sup>2</sup> (kcal)	Protein <sup>2</sup> (g)	Zinc <sup>2</sup> (mg)	Calcium <sup>2</sup> (mg)	Cost <sup>3</sup> (BDT)
Saturday	Rice, mashed mixed vegetables <sup>4</sup> and lentil	190	577	15.07	2.52	145.48	11.44
Sunday	Milk <sup>5</sup> and bun	288	368	11.48	1.36	221.6	26.1
Monday	Vegetable <sup>4</sup> khichuri and egg	250	716	29.57	4.88	174.48	17.94
Tuesday	Paratha and mixed vegetables <sup>4</sup>	185	637	12.47	3.43	190.88	10.90
Wednesday	Rice, mixed vegetables <sup>4</sup> and lentil curry	190	577	15.07	2.52	145.48	11.44
Thursday	Fortified biscuit and seasonal fruits	135	395	10.18	5.77	193.73	13.5
Total		1238	3270	93.84	20.48	1071.65	91.32
Weekly RDA <sup>6,7</sup> (% of RDA)			11100 (29.5)	156-243 (38.6)	30-48 <sup>2</sup> (42.7)	3600-7800 <sup>3</sup> (13.7)	

# Infant formula advertising in medical journals: a cross-sectional study (and struggle to publish)

By Sarah Morgan, Tony Waterston and Marko Kerac



Sarah Morgan is a Public Health Registrar currently working with National Health Service (NHS) England in immunisation and screening. She has worked in global child health, nutrition and TB with Medair, World Vision UK and as chair of the board of Target TB. This article is based on initial research carried out as part of her MSc in International Child Health at University College London (UCL).



Tony Waterston is a retired consultant paediatrician with six years' experience working in Africa. He led the Royal College of Paediatrics and Child Health health diploma programme in Palestine between 2000 and 2015 and is an honorary Fellow of the College. He is also lead moderator of Child Health Information for All (CHIFA).



Marko Kerac is Assistant Professor in Public Health Nutrition & Programme Director of the MSc in Global Health Nutrition at the London School of Hygiene and Tropical Medicine. He was a National Institute for Health Research Clinical Lecturer in Public Health at UCL at the time this project was originally conducted. Marko Kerac acknowledges NIHR support for his UCL Academic Clinical Lecturer post at UCL from 2012-2014.

## Location: *Global*

**What we know:** Breastmilk substitute (BMS) marketing within the health system, combined with other factors, can undermine breastfeeding.

**What this article adds:** The extent of BMS advertising in leading medical journals was examined from 2003-2012 and compliance of 2012 adverts was assessed against the International Code of Marketing of Breast-Milk Substitutes ('the Code'). Although BMS advertising was uncommon overall (in 12 journals reviewed, 8.6% of pages were advertisements of which 1.7% were for BMS), it varied markedly between different journals (only five out of 12 journals carried BMS adverts at all; one publishing group was responsible for almost 75% of all BMS advertising). Code compliance was poor: all advertisements contained purely promotional statements and none contained all of the information and warnings about BMS stipulated in the Code. Possible reasons for this are discussed. Journals should either screen BMS advertisements for Code compliance or, ideally, not carry BMS adverts at all; independent sources of information should be promoted instead.

## Background

Globally, 12% of all deaths of children aged under five years old are attributed to sub-optimal breastfeeding (Black et al, 2013). Infants in high-income countries fed breastmilk substitutes (BMS) have greater risk of gastrointestinal illness, otitis media and lower respiratory tract infections (Ip et al, 2009). The reasons for low breastfeeding rates are multi-factorial, but include the inappropriate marketing of BMS by manufacturers (WHO, 1981, 1998). An International Code of Marketing of BMS and subsequent relevant World Health Assembly (WHA) Resolutions (collectively known as 'the Code') aims to protect infant feeding from commercial influence. Despite the Code, questionable BMS marketing practices have been noted by several studies, including in healthcare settings (McInnes et al, 2007; Sadacharan et al, 2011; Taylor, 1998). Advertisements for BMS, including those in medical journals, should comply with stipulations of the Code. This states that information "should be restricted to scientific and factual matters, and such information should not imply or create a belief that bottle feeding is equivalent or superior to breast-feeding" and must include relevant warnings about BMS. This study aimed to describe the extent and quality of BMS advertising in high-impact paediatric and general medical journals.

## Methods

A cross-sectional study was carried out by hand-searching high-impact paediatric and general medical journals published between 2003 and 2012 to quantify the prevalence of BMS advertising. Two investigators also independently assessed the content of advertisements published in 2012 for the presence of purely promotional statements and certain information statements stipulated by Articles 7.2 and 4.2 of the Code.

## Findings

Of 63,167 pages searched in 12 journals (eight paediatric, four general), 5,462 (8.6%) were advertisements and 91/5462 (1.7%) of these were for BMS. Some journals carried no BMS adverts at all (Table 1); of five journals carrying BMS adverts, four were paediatric journals; one publishing group was responsible for almost 75% of all BMS advertising.

Five types of BMS products for infants under six months were advertised, with some advertisements simultaneously promoting multiple types. The most common advertisements were for allergy or intolerance milk (27 of 91 sides; 30% of BMS advertising), preterm milk (23 of 91 sides; 25% of BMS advertising) and general first milk (18 of 91 sides; 20% of BMS advertising). A much smaller percentage of advertisements were given to high-energy or catch-up milks

(6/91 sides; 7% of BMS advertising) and comfort milks (4/91; 4% of BMS advertising).

The 2012 sample contained 39 BMS advertisements, 14 of which were unique adverts. The reviewers agreed that all advertisements met the study definition of containing purely promotional statements and none contained all the information and warnings about BMS stipulated in Article 4.2 of the Code (Table 2).

## Discussion

Although uncommon overall, in this study period BMS advertising was carried by leading clinical journals and, in particular, two leading child health journals, *Archives of Diseases in Childhood (ADC)* and *ADC Fetal and Neonatal edition*. Adverts also appeared in the *British Medical Journal (BMJ)*, which had the highest print circulation in the UK (BMJ Group, 2013). BMS advertisements, therefore, have the potential to reach and influence many health professionals, especially those working in paediatrics.

Our second major finding of poor advert compliance with the Code is thus an important concern, given the documented deficiency in health professionals' knowledge regarding breastfeeding (Brodribb et al, 2008; Freed et al, 1995) or the risks of BMS (Feldman-Winter et al, 2008; Schanler et al, 1999) and health professionals' use of company materials for information, especially for specialist milks (McInnes et al, 2007).

## Recommendations and conclusions

We see two possible ways forward. At a minimum, journals should do more to screen and review BMS advertisements to ensure that they are fully compliant with the Code. A far better recommendation is that journals do not carry BMS adverts at all. The rationale for BMS advertising as an information source is questionable, given that there are many other opportunities for health professionals in the UK to access independent and comparative information about BMS products (Crawley & Westland, 2013).

In conclusion, it is encouraging that most journals carry limited/no BMS advertisements;

**Table 1** BMS advertising as proportion of total advertising (in sides)

Journal Title	Journal Type	Sides of BMS advertisements / sides all advertisements in sample (%)				
		2003	2006	2009	2012	ALL YEARS
The New England Journal of Medicine (NEJM)	General	0/112 (0%)	0/77 (0%)	0/69 (0%)	0 / 54 (0%)	0/312 (0%)
The Lancet (Lancet)	General	0/86 (0%)	0/65 (0%)	0 / 80 (0%)	0 / 83 (0%)	0 / 314 (0%)
The Journal of the American Medical Association (JAMA)	General	0/ 258 (0%)	0/ 265 (0%)	0 /223 (0%)	0 /200 (0%)	0 / 946 (0%)
British Medical Journal (BMJ)	General	0/ 258 (0%)	0 /299 (0%)	0 /181 (0%)	7/156 (4.5%)	7/921 (0.8%)
Pediatrics (Ped)	Paediatric	11/312 (3.5%)	6/434 (1.4%)	3/211 (1.4%)	1/168 (0.6%)	21/ 1125 (1.9%)
Archive of Pediatrics & Adolescent Medicine (APAM)	Paediatric	0 /173 (0%)	2/ 256 (0.8%)	0 /105 (0%)	0 / 94 (0%)	2/628 (0.3%)
Seminars in Fetal & Neonatal Medicine (Sem F & N)	Paediatric	0 /12 (0%)	0 / 9 (0%)	0 / 9 (0%)	0 / 8 (0%)	0/ 38 (0%)
Pediatric Critical Care Medicine (PCCM)	Paediatric	0/ 53 (0%)	0 /70 (0%)	0 /68 (0%)	0/ 75 (0%)	0/ 266 (0%)
Archives of Disease in Childhood – Fetal & Neonatal Edition (ADC F & N)	Paediatric	3/37 (8.1%)	3/13 (23%)	4/38 (11%)	7/29 (24%)	17/117 (15%)
Developmental Medicine & Child Neurology (Dev Med)	Paediatric	0/45 (0%)	0 /56 (0%)	0 /84 (0%)	0 /66 (0%)	0 /251 (0%)
Archives of Disease in Childhood (ADC)	Paediatric	8/ 124 (6.5%)	7/99 (7.1%)	7/81 (8.6%)	22/138 (16%)	44/442 (10%)
Current Opinion in Pediatrics (Curr Opin)	Paediatric	0 /27 (0%)	0 /24 (0%)	0 /31 (0%)	0 /20 (0%)	0 /102 (0%)
ALL JOURNALS		22/1524 (1.4%)	18/1667 (1.1%)	14/1180 (1.2%)	37/1091 (3.4%)	91/5462 (1.7%)

however it is regrettable that existing adverts are poorly compliant with the Code. While health professionals need information on BMS, especially specialist BMS products, advertisements are unlikely to drive evidence-based best practice. Instead, an expansion of alternative sources of independent, in-depth information is needed, which would better empower health professionals to protect breastfeeding and, where BMS are indicated, to inform choices between the large variety of BMS available more accurately. Future research is needed to investigate how today's journals compare with those reviewed in this study.

### A final word: the struggle to publish

This project was originally carried out as an MSc project at UCL (SM). When we initially

presented findings at UK conferences they were positively received, winning an oral presentation prize at one meeting. Publication has been more challenging, with our paper initially rejected by two of the journals which carried the most advertisements. While we acknowledge the limitations of our work (e.g. a limited number of journals reviewed; limited years sampled over our ten-year timeframe; an unavoidable element of subjectivity in assessing Code compliance; debates about how specialist milk advertising should differ from general BMS), we were surprised by the reason given by a final journal we submitted to. Despite editors sending our paper for review and (we believe) us addressing the relatively minor reviewer comments, we were unexpectedly told at the last stage that the paper was “beyond journal scope” – in spite of other

**Table 2** Content results for 2012 BMS advertisements

Content analysis finding	Number of BMS advertisements (%)	
	Reviewer 1	Reviewer 2
Advertisements with purely promotion statements	14/14 (100%)	14/4 (100%)
Advertisements with any statement referenced	13/14 (93%)	13/4 (93%)
Advertisements stating breastfeeding is superior	8/14 (57%)	7/14 (50%)
Advertisements expressing similarity of BMS to breast milk or breastfeeding	3/14 (21%)	2/14 (14%)
Advertisement showing happy babies or mothers	8/4 (57%)	9/14 (64%)
Advertisements containing complete set of information required in article 4.2 of code	0/14 (0%)	0/14 (0%)

articles on breastfeeding having been published previously. We wonder whether this in itself tells a story regarding the many complex issues around BMS marketing.

In 2016 the UK Royal College of Paediatrics and Child Health (RCPCH) voted to continue to accept funds from infant formula companies (Thornton, 2016), triggering important discussions as to the pros and cons of this stance (Costello et al, 2017). To what extent this vote might have been influenced by the ‘normalisation’ of BMS advertising in journals is of course unknown, but it is certainly one of many possible factors. Of note, ADC and ADC Fetal and Neonatal, the top two journals advertising BMS in our sample, are official journals of the RCPCH and go out regularly to all members and fellows of the College. In future research, we would be interested to review how many other professional associations (e.g. for midwives, dieticians, nurses and others with front-line patient contact) also carry similar advertising in member journals.

For more information, please contact Sarah Morgan at [dr.s.a.morgan@gmail.com](mailto:dr.s.a.morgan@gmail.com)

### References

Black, RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, Uauy R. (2013). *Maternal and child undernutrition and overweight in low-income and middle-income countries*. Lancet, 382(9890), 427–451. doi: 10.1016/s0140-6736(13)60937-x

BMJ Group. (2013). *Print Advertising Opportunities 2013*. Retrieved 01.07.2013 from <http://group.bmj.com/group/advertising/Print%202013%20Media%20Pack.pdf>

Brodribb W, Fallon A, Jackson C & Hegney D. (2008). *Breastfeeding and Australian GP registrars – their knowledge and attitudes*. J Hum Lact, 24(4), 422-430. doi: 10.1177/0890334408323547

Costello A, Branca F, Rollins N, Stahlhofer M & Grummer-Strawn L. (2017) *Health professional associations and industry funding*. The Lancet, Volume 389, Issue 10069, 597–598,

Crawley H & Westland S. (2013). *Infant milks in the UK. A practical guide for health professionals*. UK: First Steps Nutrition Trust.

Feldman-Winter LB, Schanler RJ, O'Connor KG & Lawrence RA. (2008). *Pediatricians and the promotion and support of breastfeeding*. Arch Pediatr Adolesc Med, 162(12), 1142-1149. doi: 10.1001/archpedi.162.12.1142

Freed GL, Clark SJ, Sorenson J, Lohr JA, Cefalo R & Curtis P. (1995). *National assessment of physicians' breast-feeding knowledge, attitudes, training, and experience*. JAMA, 273(6), 472-476.

Ip S, Chung M, Raman G, Trikalinos TA & Lau J. (2009). *A summary of the Agency for Healthcare Research and Quality's evidence report on breastfeeding in developed countries*. Breastfeed Med, 4 Suppl 1, S17-30. doi: 10.1089/bfm.2009.0050

McInnes RJ, Wright C, Haq S & McGranachan M. (2007). *Who's keeping the code? Compliance with the international code for the marketing of breast-milk substitutes in Greater Glasgow*. Public Health Nutr, 10(7), 719-725. doi: 10.1017/s1368980007441453

Sadacharan R, Grossman X, Sanchez E & Merewood A. (2011). *Trends in US hospital distribution of industry-sponsored infant formula sample packs*. Pediatrics, 128(4), 702-705. doi: 10.1542/peds.2011-0983

Schanler RJ, O'Connor KG & Lawrence RA. (1999). *Pediatricians' practices and attitudes regarding breastfeeding promotion*. Pediatrics, 103(3), E35.

Taylor A. (1998). *Violations of the international code of marketing of breast milk substitutes: prevalence in four countries*. BMJ, 316(7138), 1117-1122.

Thornton, J. (2016). *Paediatricians vote for college to continue accepting funds from infant formula companies*. BMJ, 355, i5827. doi: 10.1136/bmj.i5827

WHO. (1981). *International Code of Marketing of Breast-milk Substitutes*. Geneva WHO.

WHO. (1998). *Evidence for the ten steps to successful breastfeeding*. Geneva: WHO.



# Training Care Groups on sexual and gender-based violence in rural Niger

By Bruce W Larkin and Julie Tanaka



Bruce W Larkin is a doctoral candidate (MD) at the Medical School for International Health at Ben-Gurion University of the Negev, Beer-Sheva, Israel. He formerly worked as the Health & Nutrition Programme Manager for Samaritan's Purse Niger office. Bruce has public health experience in Bangladesh, the Democratic Republic of Congo, Gabon and Niger.



Julie Tanaka is the Senior International Nutrition Advisor for Samaritan's Purse. She helps field offices around the world with programme design, proposal review, implementation, nutrition surveys, trainings, monitoring and evaluation, and emergency relief.



Samaritan's Purse

A leader mother explaining what she has learned on exclusive breastfeeding, Banibangou Commune, Niger, 2016

## Location: Niger

**What we know:** Nutrition insecurity is exacerbated by major gender inequalities. Intimate partner violence (IPV) can negatively affect the nutrition status of women and their children.

**What this article adds:** Major gender inequalities exist in Niger; physical violence against women is ubiquitous. Training on sexual and gender-based violence (SGBV) was integrated into a pre-existing care group programme in rural Niger providing cascading training on infant and young child feeding and maternal and child health to 5,000 women and men. SGBV training was provided over two months to uneducated health promoters, who in turn trained men and women in care groups, who each then trained 10-12 neighbours of the same gender. A survey examined SGBV attitudes and knowledge of 1,374 participants at different levels. Overall, the percentage of correct attitude responses increased from 43.0% to 71.9%, with a similar improvement among women and men. There were improvements in attitudes towards physical violence, forced sexual intercourse and roles of wives in financial decision-making, indicating potential to transmit SGBV messaging through this model. Misinterpretation of two knowledge areas indicates need for closer attention and follow-up of more nuanced/complex topics. Overall, pilot results demonstrate that SGBV messaging can be successfully integrated into Care Group (CG) interventions.

## Background

Niger is reportedly one of the most difficult places in the world for women to live. Major gender inequalities persist and women and girls are frequent victims of sexual and gender-based violence (SGBV). The Nigerien government reports that physical violence against women is ubiquitous in Nigerien society (MPFPE, 2008) and that 70% of women believe that men may justifiably beat their wives (INS, 2007). Malnutrition is also a persistent and widespread problem in Niger, which has a global acute malnutrition (GAM) rate of 10.3% (classified as 'serious') and stunting prevalence of 42.5% among children under the age of five (U5) (PDES, 2016). Research shows that nutrition insecurity can be exacerbated by gender inequalities, as women and girls frequently lack equal access to nutritious foods (younger children and females are typically fed last and least during mealtimes), clean water and healthcare (IASC, 2015). There is also evidence of associations between intimate partner violence (IPV) and low-birth weight

(LBW) (Mezzavilla and Hasselmann, 2016), anaemia and low body mass index (BMI) for female victims (Ackerson and Subramanian, 2008) and stunting among children in affected families (Rico et al, 2011). Disagreement on how food-resources should be allocated may also result in IPV (IACS, 2015).

The lack of gender equality is particularly troubling in rural areas, such as the Banibangou Commune along the Mali border. This under-resourced area is vulnerable to attacks by bandits and Islamic extremists associated with Al-Qaeda in the Islamic Maghreb. According to focus group discussions conducted by Samaritan's Purse, speaking out on SGBV within the community is taboo. Local authorities have been known to prohibit victims from voicing their complaints to the police and victims reportedly avoid seeking help from the local health centres out of fear that patient confidentiality will not be respected. This region also suffers from chronic drought and food insecurity. A February 2017 survey of 11 villages in Banibangou Commune

revealed a 26.5% (95% CI = 20.5%-32.6%) GAM prevalence among children aged 6-23 months, a 17.4% (95% CI = 12.23%-22.66%) SAM prevalence, and only 7.96% (95% CI = 4.22%-11.70%) of children consuming a minimum acceptable diet, as defined by WHO (SPN, 2017).

Samaritan's Purse implemented and had oversight of a community-based management of acute malnutrition (CMAM) programme between 2006 and 2016 in Banibangou Commune, funded by WFP. In 2016, CMAM support was phased out, since WFP ceased funding non-governmental organisations (NGOs) to oversee CMAM programming due to budgetary constraints; responsibility was handed over to the Ministry of Health (MoH) and the Bridging Gaps in Community Health (BGCH) project was launched (funded by Samaritan's Purse) to better address the community's maternal and child health (MCH) needs and prevent malnutrition. The BGCH project has used Care Groups (CGs) to regularly train over 5,000 adults in infant and young child feeding (IYCF), MCH practices and birth spacing. Samaritan's Purse also engaged local imams to discuss the compatibility of birth spacing, SGBV and the Koran (Box 1). As a result of the training, many villagers reported feeling empowered by their imams to obtain contraceptives.

Given the tremendous gender needs in Niger, Samaritan's Purse sought to pilot a project in all the ongoing Care Groups to test whether trained illiterate adults could successfully transmit key SGBV messages using the Care Group methodology. The pilot lasted for two months, with six hour-long trainings, and included adapted lessons from Phase 1 of Sasa! Faith training manual (Michau and Siebert, 2016).

## Methodology

The CG methodology involves bi-weekly gathering of community volunteers of reproductive age (referred to as "Leader Mothers" (LMs) and "Leader Fathers" (LFs)) into CGs. Through these CGs, trainings are provided by Health Promoters, who are community volunteers recommended by community leaders, literate, trained by the

**Table 1** Distribution of correct responses to SGBV attitude questions in pilot pre-test (September 2017) and post-test (November 2017) among BGCH II CG beneficiaries

Question	Correct Response	Pretest		Post-test		Statistically Significant? (p>=0.05)
		n	% (95% CI)	n	% (95% CI)	
Husbands have the right to force their wives to engage in sexual intercourse.	FALSE	1036	39.5% (35.27% - 43.7%)	1365	90.8% (88.60%-92.9%)	Yes
Men have the right to beat their wives.	FALSE	1036	38.7% (34.51% - 42.9%)	1363	92.3% (90.29% - 94.3%)	Yes
It is acceptable for a man to force his wife to give him the money she has saved.	FALSE	1036	33.6% (29.52% - 37.7%)	1372	90.7% (88.49%-92.8%)	Yes
Using one's power over someone else is abuse of that person's rights.	TRUE	1036	44.2% (39.93% - 48.5%)	1364	92.3% (90.30% - 94.3%)	Yes
I have the power to promote change in my community.	TRUE	1036	53.3% (48.99% - 57.6%)	1363	91.6% (89.48% - 93.6%)	Yes
I have the power to promote change in my community. (Women only)	TRUE	756	52.5% (47.48% - 57.5%)	748	90.8% (87.84%-93.7%)	Yes
Who is the decision maker on major purchases in your household?*	Both Husbands and Wives	1040	21.2% (17.64% - 24.7%)	1363	83.9% (81.18% - 86.7%)	Yes

\*Participants were given the option of responding, "Husband," "Wife," or "Both Husband and Wife." "Both Husband and Wife" was considered the correct response.

MoH on MCH and IYCF principles, and given a small stipend and means of transportation from Samaritan's Purse. The Health Promoters equip LMs and LFs to relay MCH and IYCF messages to 10-12 of their neighbours of the same gender through Neighbourhood Groups (NGs). This cascading training methodology has been demonstrated to increase coverage of key child survival indicators (George et al, 2015). Men and women from the same households were enrolled in separate CGs to ensure that husbands allow their wives to apply the lessons learned. Through this method Samaritan's Purse provided SGBV training over two months from September to November 2017 to all Health Promoters in the existing programme, who went on to train 302 LMs (who themselves went on to train 3,113 neighborhood women) and 217 LFs (who trained 2,391 neighborhood men).

The SGBV training comprised two modules used to train CG members and was heavily adapted from Phase 1 of Sasa! Faith. Samaritan's Purse developed laminated images to accompany the lessons. Each module was taught over three one-hour sessions. Key messages from the modules included:

- Types of social power and power dynamics
- An explanation of 'equality', defined as all individuals having the same rights, opportunities and life chances, regardless of gender or age
- The types of violence commonly enacted against women
- The need for victims of sexual violence to be referred to a health centre within 72 hours of any incident
- The different ways in which violence impacts groups of people within society.

Six female CGs and five male CGs were randomly selected to participate in SGBV knowledge and attitude surveys to evaluate the pilot project. Each of the LMs and LFs included in these groups also then carried out the survey with members of their NGs. In addition, one set of ten LMs, ten neighbourhood women (NW), ten LMs and ten neighbourhood men (NM) were separately included in focus group discussions (FGDs).

**Results**

A total of 1,374 participants (757 female and 617 male, of whom 69 were LMs, 688 NW, 57 LFs and 560 NM) were surveyed on the same questions pertaining to SGBV before and after the two-month pilot (Tables 1 and 2).

The percentage of participants providing correct responses decreased for two of the three more complex knowledge questions asked regarding whether men are victims of rape as frequently as women and how violence against women is defined (Table 2). It is plausible that the trainees would have mastered these concepts if the training was prolonged.

Overall, the percentage of correct responses increased from 43.0% (95% CI=41.6-44.5%) to 71.9% (95% CI=70.8-73.1%) between the pretest and post-test, indicating that illiterate adults could successfully learn and teach SGBV topics. The overall rate of improvement in attitudes between pre- and post-tests was similar between LMs/LFs and NM/NW (40.0% to 74.4% and 43% to 71.7% respectively) and between women and men (42.9% to 71.8% and 43.3% to 72.1% respectively). Of note, the percentage of beneficiaries reporting that men have the right to beat their wives decreased from 61.3% to 7.7% (Table 1). The percentage reporting that husbands have the

right to force their wives to engage in sexual intercourse similarly decreased from 60.5% to 9.2%.

The training appeared to influence how beneficiaries understood the roles of wives in financial decisions. When asked who makes financial decisions on major purchases, the percentage of respondents who said "both the husband and the wife" (compared to "just the husband" or "just the wife") increased from 21.2% to 83.9%. The percentage of respondents believing that men may force their wives to give them the money she has saved decreased from 66.4% to 9.3%. This is significant, given that men are the main financial decision-makers in Nigerian society (Save the Children, 2018).

**Discussion**

Pilot results demonstrate that SGBV messaging can be successfully integrated into CG interventions. Although most of the participating LMs and LFs were illiterate adults with no preconception of gender rights, attitudes on several taboo topics changed over a two-month period.

As many nutrition programmes focus on the most vulnerable groups within society (pregnant and lactating women and children U5), nutrition interventions provide a unique platform for protection programming. SGBV is not currently explored in the standard CMAM case management undertaken by the MoH. CGs, in particular, provide an inexpensive method of efficiently disseminating SGBV messages to men and women, as well as empowering women by allowing them to take an active role in teaching their neighbours. Future studies should further measure the effects of promoting SGBV on IYCF and nutritional status indicators over an extended period of time.

**Table 2** Distribution of correct responses to SGBV knowledge questions in pilot pre-test (September 2017) and post-test (November 2017) among BGCH II CG beneficiaries

Question	Correct Response	Pretest		Post-test		Statistically Significant? (p>=0.05)
		n	% (95% CI)	n	% (95% CI)	
Men are just as frequently victims of rape as women.	FALSE	1036	69.7% (65.73% - 73.6%)	1365	6.6% (4.73% - 8.5%)	No
Men, women, boys, and girls are all usually affected similarly by emergency situations.	FALSE	1036	56.7% (52.39% - 60.9%)	1364	90.4% (88.18% - 92.6%)	Yes
Violence against women is any act directed at a girl or woman that causes harm and is meant to keep a girl or woman under the control of others.	TRUE	1036	30.6% (26.63% - 34.6%)	1364	8.8% (6.67% - 10.9%)	No

There are limitations to using CGs to transmit SGBV messaging. Some concepts, such as the definition of violence towards women (Table 2), may have been too complex for the participants to comprehend. It appears that many beneficiaries misapplied gender equity to mean that both men and women are victims of rape equally (Table 2). Future use of CGs in SGBV programming will need to place additional emphasis on the nuances of gender equity. It is possible that these unexpected results could also be attributed to the short duration of the pilot. Over an extended project life-cycle concepts would be repeated and project staff would be able to identify and address gaps in beneficiary comprehension of subject material.

The use of a modified version of Sasa! Faith proved to be an effective curriculum for the rural Muslim audience. The curriculum aims to promote gender equality by encouraging participants to reflect on how power dynamics affect interpersonal relationships. Subsequent lessons guide participants to apply the concept of power to gender equity and violence against women.

## Box 1

### Description of programme to train imams in birth spacing and SGBV

In June 2017 Samaritan's Purse held a training with 14 imams on the importance of birth spacing and addressing gender-based violence. Both issues are relevant in Niger, which has the world's highest fertility rate at 7.6 live births per woman (World Bank, 2015). Negligence of family planning contributes to the high malnutrition rate in Niger. Religious leaders were targeted for the training in part to address the commonly held belief that family planning is a western ploy to curb Islamic population growth. The training emphasised that the purpose of birth spacing is to protect the health of the mother and child. Pre-test and post-test results demonstrated that the percentage of participants believing that birth spacing involves the permanent cessation of pregnancies decreased from 67% to 0%. The percentage of imams believing that religious and community leaders have the responsibility to advocate for girls who are victims of sexual violence increased from 92% to 100%. At the end of the training, each imam proposed ways that they would personally address birth spacing and SGBV in their communities.



Village leaders discussing sustainable ways of improving the local health infrastructure, Banibangou Commune, Niger, 2016

This varies drastically from programmes that rely on dogmatic instructional messaging against SGBV (Michau et al, 2015). This subtle approach was apt for the audience, who may have been resistant to a more overt form of messaging.

Samaritan's Purse took several precautions before exposing community members to the sensitive topic of SGBV; issues of sexual violence are extremely taboo in this context. Community leaders and village chiefs were informed of these trainings before they took place. Prior to the pilot, local imams were trained on the importance of birth spacing and SGBV. Male CG participants tended to be receptive to SGBV lessons once they were informed that their imams approved the trainings. Focus group discussions illuminated the fact that the community lacks protection services.

## Conclusions

Even with uneducated instructors, certain SGBV messages can be effectively transmitted using the CG model. As SGBV is a pertinent issue, it is suggested that nutrition actors incorporate SGBV messaging in their behaviour-change programming. Nutrition insecurity is linked to gender inequality and improved women's empowerment, and gender equity can affect intra-household food distribution; women's decision-making power over income, time and childcare practices; and household division of labour. All these things can affect a woman's ability to practice the kinds of IYCF behaviours that lead to improved nutritional status for children during their most vulnerable years. These educational sessions, however, should be closely monitored to ensure that nuanced topics are clearly understood.

*Due to security concerns, Samaritan's Purse withdrew from the Banibangou Commune in December 2017. Samaritan's Purse continues health and nutrition programming in other areas in Niger.*

## Testimonials (collected from women only):

After the very first SGBV pilot training with Leader Mothers, one of the women exclaimed, "I never realised that it wasn't okay for men to beat their wives!"

During the time of the pilot, the daughter of Sarratou\*, a project beneficiary, was being forced into marrying her relative. Her daughter complained to the local police, who told the family that the girl had the right to refuse the marriage. Sarratou's family was furious and wanted to disown the girl. The SGBV training that Sarratou received, however, helped her understand that her daughter should not be married against her will. Fortunately, Sarratou was able to convince her family that they should allow her daughter to remain unmarried and peacefully stay in their home. Sarratou now tells her female neighbors to avoid being given in a forced marriage.

Mariama\* participated as a BGCH Leader Mother and was encouraged by the SGBV lessons. "With the pilot [lessons on violence against women], I have understood that wives must also be involved in the family's financial decisions."

Mariama is now taking the initiative to become more financially independent in order to better take care of and protect herself and her children. She is also advising her neighbors to do the same: "I urge the other mothers to send their daughters to school in order to prevent the girls from falling into the same mistakes as their mothers."

\* Names have been changed for reasons of confidentiality.

For more information, please contact Julie Tanaka at [jtanaka@samaritan.org](mailto:jtanaka@samaritan.org)

## References

Ackerson LK & Subramanian 2008. *Domestic violence and chronic malnutrition among women and children in India*. *Am J Epidemiol*. 167(10):1188-96.

George et al 2015. *Evaluation of the effectiveness of care groups in expanding population coverage of key child survival interventions and reducing under-5 mortality: a comparative analysis using the lives saved tool (LIST)*. *BMC Public Health*, 15:835.

IASC 2015. Inter-Agency Standing Committee (IASC) 2015. *Guidelines for Integrating Gender-Based Violence Interventions in Humanitarian Action: Reducing risk, promoting resilience and aiding recovery*.

INS 2007. Institut National de la Statistique 2007, *Enquête de base dans 11 communes du programme Niger Unicef*.

Mezzavilla RS & Hasselmann MH 2016. *Physical intimate partner violence and low birth weight in newborns from primary health care units of the city of Rio de Janeiro*. *Rev. Nutr.* vol.29 no.3.

Michau L & Siebert S 2016. *SASA! Faith: A Training Manual to prepare everyone involved in SASA! Faith, Raising Voices*.

Michau L, Horn J, Bank A, Dutt M, Zimmerman C 2015. *Prevention of violence against women and girls: lessons from practice*. *Lancet*, 385(9978):1672-84

MPFPE 2008. République du Niger, Ministère de la Promotion de la Femme et de la Protection de l'Enfant (MPFPE) 2008. *Analyse de la situation de la situation de l'Enfant et de la Femme au Niger - 2008*.

PDES 2016. Ministère du Plan 2016, *Plan de Développement Economique et Social (PDES) 2017-2021* :

*La Nutrition, Une Priorité*. Papier De Positionnement. Gouvernement De La République Du Niger.

Rico E et al 2011. *Associations between maternal experiences of intimate partner violence and child nutrition and mortality: findings from Demographic and Health Surveys in Egypt, Honduras, Kenya, Malawi and Rwanda*. *J Epidemiol Community Health*. 65(4):360-7.

Samaritan's Purse Niger 2017. *Diffa Gender Analysis*.

Save the Children 2018. *Mainstreaming Gender-Based Violence Considerations in Cash-Based Interventions: A Case Study from Zinder, Niger*.

World Bank 2015. *Fertility Rate, Total (births per Woman)*. The World Bank Group. Available from: <http://data.worldbank.org/indicator/SP.DYN.TFRT.IN>

A child's MUAC is measured as her grandmother holds her by the CMAM District Coordinator Sudhakar, Bokaro, India, 2017

## Treatment of severe acute malnutrition through the Integrated Child Development Scheme in Jharkhand State, India

By Grana Pu Selvi and Colleen Emary



Grana Pu Selvi has postgraduate qualifications in food and nutrition and international public health. She

has been working with World Vision India for the past seven years leading a country-wide maternal, newborn, child health and nutrition intervention.



Colleen Emary is a public health nutritionist with 17 years' experience in international public health

nutrition. She currently works as a health and nutrition technical advisor with World Vision International, based in Canada.

The authors would like to thank the State Nutrition Mission, Jharkhand for giving the opportunity and ongoing support to implement this programme, World Vision Hong Kong for its financial support and World Vision India for its leadership and support to pilot this programme. The authors would also like to express their appreciation for the dedicated work of Sudhakar Subburayan of World Vision India, who has been instrumental in piloting the community-based management of acute malnutrition (CMAM) project in coordination with the respective departments in Bokaro district.

Location: *Jharkhand State, India*

**What we know:** The prevalence of acute malnutrition in India is high; community-based management of acute malnutrition (CMAM) is not widely implemented.

**What this article adds:** A flagship pilot outpatient severe acute malnutrition (SAM) treatment programme was implemented through the Integrated Child Development Scheme in Bokaro district by World Vision India in collaboration with Jharkhand State Nutrition Mission. Fifty-one outpatient therapeutic programme sites were established at existing anganwadi centres; existing staff were trained and 40 volunteers recruited. Caseload was identified through household screening based on mid-upper arm circumference  $<11.5$  cm. Complicated cases were referred to existing inpatient services. In 2017 the cure rate was 61%, the death rate was 0% and the defaulter rate was 39%. Factors contributing to the high defaulter rate included poor tolerance of ready-to-use therapeutic food, migration, festivals and duration of minimum stay (eight weeks). Areas for improvement include stronger community mobilisation, better integration of medical care in outpatient care, coordination with other SAM treatment services, and harmonised inpatient/outpatient protocols and systems. An external partner remains necessary to provide overall coordination, capacity-building, technical oversight and monitoring/evaluation support.

### Background

The Indian State of Jharkhand recently joined the Scaling Up Nutrition (SUN) Movement; one of three in India to do so. India's national survey data (for 2015-2016) reported 21% prevalence of global acute malnutrition (GAM) (weight-for-height z-score (WHZ)  $<-2$  SD), with 29% GAM and 11.4% severe acute malnutrition (SAM) reported in the State. A baseline survey conducted in March 2016 of World Vision (WV) India programming areas in the Bokaro district of Jharkhand reported 28% GAM (WHZ  $<-2$ SD) in children aged 6-59 months.

At the request of the Jharkhand State Nutrition Mission, WV India commenced a pilot outpatient SAM treatment programme (OTP) through the Integrated Child Development Scheme (ICDS) in Bokaro district, the first of its kind in Jharkhand. The ICDS in

India is the world's largest integrated early childhood programme, with over 40,000 centres nationwide<sup>1</sup>. The programme offers health, nutrition and hygiene education to mothers; informal pre-school education to children aged three to six years; supplementary feeding for all children and pregnant and lactating women (PLW); growth monitoring and promotion; and links to primary healthcare services such as immunisation and vitamin A supplements. These services are provided at anganwadi centres (AWCs); each run by one anganwadi worker (AWW) and one helper. Given the decentralised structure of the ICDS and the proximity of AWCs to the community, this has the potential to be an ideal platform for community-based management of acute malnutrition (CMAM).

The implementation approach in this context used the existing ICDS structure, setting up OTP

<sup>1</sup> See [www.unicef.org/earlychildhood/files/india\\_icds.pdf](http://www.unicef.org/earlychildhood/files/india_icds.pdf)

**Table 1** MUAC screening in Chandankiyari and Chas blocks

Block	Total screened (n)	Global acute malnutrition (GAM) (MUAC <12.5 cm)	Moderate acute malnutrition (MAM) (MUAC ≥ 11.5 cm, <12.5 cm)	Severe acute malnutrition (SAM) (MUAC <11.5 cm)
Chandankiyari	9,055	751 (8.3%)	659 (7.3%)	92 (1.0%)
Chas	11,470	748 (6.5%)	623 (5.4%)	125 (1.1%)
<b>Total</b>	<b>20,525</b>	<b>1499 (7.3%)</b>	<b>1282 (6.3%)</b>	<b>217 (1.1%)</b>

sites for uncomplicated SAM cases at selected AWCs. Cases of SAM with complications were referred to inpatient facilities at government-run Malnutrition Treatment Centres (MTCs). Within Bokaro, one MTC centre covers three blocks. The pilot project targeted two blocks within Bokaro district; initially Chandankiyari and later expansion to Chas (population 230,238 and 813,402 respectively, as per 2011 census). The purpose of the pilot was to explore the feasibility of using the ICDS system to provide outpatient SAM treatment and documenting lessons learned to inform future policy and programming. The pilot ran from January to September 2017. A post-project evaluation was conducted in September 2017.

This article describes the process of piloting CMAM within the ICDS system, along with the main findings of the project evaluation.

### Preparatory phase

A memorandum of understanding (MoU) was signed between WV India and the Jharkhand State Nutrition Mission, outlining roles and responsibilities for the project at state level. The responsibilities of WV India included overall coordination of the procurement of ready-to-use therapeutic food (RUTF) and technical support, while the State Nutrition Mission provided technical advice, periodic review of data and ongoing technical guidance to improve programme quality. In the absence of state-level guidelines for outpatient management of acute malnutrition, WV India drafted operational guidelines, based on international protocols, contextualised for the ICDS implementation environment. This document served as an important technical reference for the project, particularly for WV India.

Local negotiations were undertaken at Bokaro District level to ensure that the necessary support was in place for the pilot, including the provision of equipment, local stakeholder engagement, regular review meetings, and capacity-building. The District Collector, District Social Welfare Officer and Child Development Programme Officer were the key stakeholders engaged to create the necessary enabling environment. There are 384 AWCs in Chandankiyari and 597 in Chas blocks, although not all are operational. An AWC facility assessment checklist was developed to identify potential sites for OTP services. Assessment criteria included structural integrity of the building, size of space, available staffing and equipment.

While MUAC screening had been rolled out in the district through ICDS as part of routine growth monitoring, it was not well implemented.

Rather than using existing ICDS growth monitoring records, which were considered incomplete, the local government requested an exhaustive house-to-house MUAC screening of children aged 6 to 59 months prior to OTP start-up. Two hundred and seventeen SAM cases were identified (see Table 1 for screening data).

Using the findings of the facility assessment along with MUAC screening results, AWCs were selected as OTP sites that were situated close to families with SAM children and that had the necessary capacity. OTP sites were launched in April 2017, beginning with 14 and increasing to 51 in a progressive manner as SAM cases were identified through house-to-house screening. As Chandankiyari block was the primary focus for the project, OTPs were launched in this block first, followed by Chas.

Training on outpatient management of SAM was provided jointly by the State Nutrition Mission and WV India health and nutrition staff to AWWs, Auxillary Nurse Midwives (ANMs) and Accredited Social Health Activist (ASHA) workers. Across the two blocks, 460 AWWs, 29 ANMs and 80 ASHA workers were oriented on CMAM, with in depth training provided to 40 ANMs and AWWs. Training materials and reference tools (wall posters) were developed for AWWs and ANMs to assist with protocol adherence. In addition, 1,900 AWWs were trained on MUAC measurement and provided with MUAC tapes at district level. Mechanisms were established for management of stock, routine monitoring and supervision through the ICDS system.

As the intent of the pilot was to implement OTP through the ICDS system, existing staff members were used (e.g. AWWs and the ICDS supervisory structure). WV India provided a dedicated CMAM coordinator for the pilot in addition to a network of 40 volunteers supporting nutritional screening, referral and monitoring activities.

### Implementation phase

Children aged 6-59 months with a MUAC of <11.5 cm and good appetite were eligible for admission to the AWC OTP. A MUAC-only admission criterion was used, given its stronger association with mortality than WHZ and as it was considered to be most feasible in the context, given the skill level of AWWs. Children with poor appetite or other signs of medical complications were referred to the MTC for inpatient care. Amoxicillin was provided upon admission. Children returned for weekly follow-up sessions. Children had a minimum eight-week stay in the programme and were discharged after eight weeks if their MUAC was >11.5 cm.<sup>2</sup> Children who did

not reach the discharge criteria by eight weeks were referred to the MTC for further investigation and treatment. Upon discharge children were enrolled in AWC services which included a supplementary feeding programme (SFP).

The MTC provided care for complicated cases as per the government protocol, which is a standard of two weeks of inpatient care, irrespective of whether the child was referred from a community where outpatient treatment for SAM was available. It was not possible within the scope of this pilot to modify MTC protocols and this needlessly extended the inpatient stay of some children, who could have continued their treatment on an outpatient basis once their initial complications had stabilised. During the pilot project, admission rates to the MTC increased by 15% over the same period from the previous year. This was possibly due to increased identification and referral of SAM cases.

### Pilot achievements

Fifty-one OTP sites were established at existing AWCs within walking distance (between five and 20 minutes from home), admitting 158 SAM cases over the October to April 2017 period (See Table 2 for treatment outcomes). More girls were enrolled for treatment (63%; n=100) than boys (37%; n=58). Thirty-four cases, representing 21% of admitted children, were referred to MTC from the OTP sites. This level of referral for inpatient care is higher than normally expected and is likely due to an outbreak of chicken pox and measles during the programme period; many children developed fever and lack of appetite as a consequence. It was discovered that routine measles immunisation had not occurred in that community in the last three years. In response, the Department of Health (DoH) was notified and an immunisation campaign was launched in the affected communities. Although 34 children were referred from the OTP to the MTC, only 13 children returned from the MTC to continue treatment in the OTP, with the remaining lost to follow-up. Referral mechanisms were ad hoc, with MTC staff unaware of where OTP AWC sites were located and therefore unable to provide this information to families upon discharge. Referrals relied upon WV India facilitating follow-up and transportation for the families.

Seventy-two children (61%) were discharged as cured from the OTP, meaning that they attained a MUAC of > 11.5 cm with a minimum eight-week stay in the programme. This is below the Sphere Standard of 75%, undoubtedly affected by the high default rate (39%). Reasons for high defaulting were explored through focus group discussions and key informant interviews. The main reasons reported were: poor tolerance of RUTF (loose stools, vomiting), migration for

<sup>2</sup> In the absence of national or state protocols, discharge criteria of minimum eight week stay and MUAC > 11.5cm was used for this pilot, as this criteria had been used in other states in India. Recently, there has been consensus among the State Nutrition Mission and implementing partners in Jharkhand to adopt the WHO-recommended discharge criteria of > 12.5 cm with no oedema for the last two weeks. World Vision has since adopted these criteria.



Jim Kasom

work and attendance at local festivals. The minimum eight-week stay was also noted as a possible reason for high defaulting. A review of defaulting cases found that some children defaulted after five to seven weeks in the programme with a MUAC > 11.5 m, suggesting that once a child was visibly better the caregiver did not feel it was important to return for the final weeks.

### Lessons learned

The project was viewed as appropriate by local stakeholders and in line with local needs. Malnutrition was identified as a significant problem, with the barriers to accessing treatment through MTC acknowledged by all stakeholders. The use of the ICDS as a platform for OTP was viewed as appropriate as it is the most decentralised formal government system, thereby giving the community good access to the programme. Active participation of stakeholders was initially slow at the onset of the project; however, with state and local government leadership, local stakeholders began to value the service provided and fulfilled their respective responsibilities.

The project substantially increased access to SAM treatment, with OTP centres established within walking distance of families affected by SAM. Caregivers reported close proximity of treatment, shortened time required for weekly visits and visible improvements in the health of their children as motivators to attend OTP. In general, the use of RUTF was acceptable to caregivers, although there were some reports of diarrhea and vomiting after consumption.

Local capacity was built within the anganwadi system to manage acute malnutrition. AWCs

were open regularly, were staffed and had the necessary supplies. It was perceived that inclusion of the OTP within the AWC improved the overall function of the system. While AWWs reported the feasibility of incorporating SAM treatment into their routine activities, simplified protocols and job aids are needed to match the skill level of AWWs.

While AWWs assumed the primary role for screening and provision of care, medical inputs for routine medication administration and clinical care were to be provided through the health system (ANMs). However, ANMs were not available to provide service on a consistent basis throughout the project. Extensive efforts were made by WV India (e.g. transport, ongoing negotiation with district health authorities) to strengthen this component of the project, however, it remained weak. A tripartite agreement between State Nutrition Mission, Health Department and WV India would help to create the necessary enabling environment to support implementation.

A major area of weakness in project design related to community mobilisation assessment and planning. While there were some activities to sensitise the broader community to the project, most effort was directed at the primary caregiver, usually the mother, with respect to treatment and care of her malnourished child. The important role of other household members (such as father, mother/mother-in-law) in child caring and feeding was not considered and these groups were not directly included in the education and mobilisation activities. In some cases, this made it difficult for the caregiver to provide home treatment of SAM for her child as directed. Future projects should take into consideration these important cultural roles. The lack of effective community outreach undoubtedly contributed to the high defaulter rate and slow recovery rate for some children. Community discussions were needed to share progress of the project with beneficiaries and to address concerns which impacted attendance and acceptance of outpatient treatment for SAM.

In addition, there is an ongoing broader discussion about where CMAM services are best located in Jharkhand. One opportunity is to provide services at sub-centre level (periphery health posts managed by the Health Department), as is currently being done by Médecins Sans

Frontières (MSF) in some locations. However, this will reduce accessibility of services as longer travel time is required to reach the sub-centres, which serve a population of 5,000 people. This will need to be resolved to ensure the future sustainability of the treatment services for acute malnutrition.

### Recommendations

While the pilot in Bokaro district was the first attempt to use the ICDS as a platform for acute malnutrition treatment services, other actors (MSF, Save the Children and UNICEF) are providing outpatient SAM treatment in Jharkhand through the Department of Health (DoH). Prior to the implementation of this pilot, a consultation with other actors in Jharkhand State to harmonise clinical protocols would have been helpful. It would also have been useful to set up this pilot as an operational research project, which would have allowed for more in-depth analysis of individual child-level data. This required additional resources which were not available at the time.

Rates of GAM and SAM identified through MUAC screening were found to be much lower than previous surveys in Jharkhand State that were based on WHZ. It has been hypothesised that body shape is influencing WHZ (Myatt, 2017), which may partially explain this, but more research is needed on this subject for the India subcontinent. It would also be valuable to monitor children who do not meet the MUAC admission criteria but have a WHZ < -3 SD or WAZ < -3 SD to contribute to the evidence base on the risks of excluding these children.

Harmonisation of MTC and OTP protocols should be undertaken in Jharkhand so that inpatient and outpatient care can be provided in a coordinated manner, rather than as two separate interventions.

In conclusion, the pilot demonstrated that it is feasible to implement outpatient treatment for SAM through the ICDS system. The decentralised structure of the AWCs provide highly accessible service for communities and the AWWs report it is feasible to include outpatient management of SAM within their existing role. However, the current ICDS system cannot deliver OTP services without external support for capacity-strengthening. An external partner is needed to provide overall coordination, capacity-building, technical oversight and monitoring/evaluation support. In addition, a tripartite agreement between State Nutrition Mission (Women and Child Development Department), DoH and external partner is required to ensure clinical/medical care is available at OTPs. If outpatient care for SAM is endorsed by the State and an enabling environment is created for implementation, local capacity can be developed with a view to providing outpatient treatment for SAM as part of routine government services.

For more information please contact Grana Pu Selvi at [Grana\\_Selvi@wvi.org](mailto:Grana_Selvi@wvi.org)

### References

M Myatt, personal communication, September 27, 2017.

Discharge category*	Bokaro CMAM project (n)
Cured/recovered	61% (72)
Died	0%
Defaulted	39% (46)
Non-recovered	0%
Referral to MTC	22% (34)

\* Definitions for discharges: Cured – child reached discharge criteria (for this project, MUAC > 11.5 cm and minimum eight week stay in OTP); Died – child died while enrolled in OTP; Defaulted – child was absent for three consecutive OTP sessions; Non-recovered – child did not reach discharge criteria after 16 weeks in OTP.

# Nutrition-sensitive agriculture in Zambia: A continued work in progress<sup>1</sup>

By Mary Corbett



Mary Corbett is a Nutrition Adviser for Self Help Africa (SHA), based in Dublin and supporting country programmes. Mary

has around 25 years' humanitarian experience working in health and nutrition with many organisations in various roles. She has a Master's degree in Nutrition, a diploma in Tropical Medicine and a nursing background.

SHA is an international, non-governmental organisation working in ten countries in Africa, focused on supporting small-holder farmers to strengthen agriculture and enterprise. In the last five years a strong nutrition component has been embedded in newly funded programmes.

The author would like to acknowledge the hard work of the SHA team in Zambia, in particular SHA staff in Northern Province. Special recognition is given to Edward Meleki (Programme Coordinator) for all his support over the years. The author would also like to recognise and thank all other stakeholders involved in this programme, including the Ministry of Health and Ministry of Agriculture and Livestock (MAL). A special thanks to all the communities in Luwingu and Mbala districts. Finally, the author gives her sincere appreciation and thanks to Irish Aid for funding this innovative programme, giving the flexibility to SHA to adapt the programme to needs as they arose.

## Location: Zambia

**What we know:** Integration of nutrition into agriculture programmes has mixed success in terms of impact on nutrition outcomes, such as stunting.

**What this article adds:** The Community Integration of Nutrition in Agricultural Programming approach was piloted by Self Help Africa (SHA) in Zambia between 2013 and 2017. It tested incorporation of nutrition into agriculture and enterprise programmes with smallholder farmers through a multi-sector approach, targeting 16,000 households focused on women, children and vulnerable groups. The approach involved nutrition-specific interventions (IYCF support, vitamin A supplementation), a strong WASH component (World Vision partnership) and agriculture (training to farmers on improving food security, diversity and storage). Programming was delivered through selected (wealth-ranked) and trained community groups. Impact was found on stunting prevalence in children under 18 months of age (reduction from 38.5% to 31.4% after two and a half years of intervention); the proportion of severe stunting fell; and there were significant improvements in antenatal care attendance, IYCF practices and WASH practices. Household dietary diversity also improved. Success factors include embedding nutrition within the community through basic nutrition and WASH training; converging agriculture and nutrition at household level; and close collaboration between the Ministry of Health, the Ministry of Agriculture and SHA. A strong agriculture programme and strong community buy-in from the outset laid the foundations for strengthening nutrition.

## Background

The CINAP (Community Integration of Nutrition in Agricultural Programming) approach was piloted by Self Help Africa (SHA), funded by Irish Aid, in Northern Province, Zambia (Irish Aid Local Development Programme) between 2013 and 2017 with a one-year extension in 2018 to support consolidation and exit. The purpose of the approach was to test the incorporation of nutrition into agriculture and enterprise programmes with smallholder farmers through a multi-sector approach. This was a development programme in two districts (Luwingu and Mbala), targeting 16,000 households (approximately 90,000 beneficiaries), with a focus on women, children and other vulnerable groups. The three objectives of the programme were to increase market-oriented sustainable agriculture production and productivity; improve the nutrition and health status of vulnerable households in the Northern Province; and improve service delivery to local communities by local authorities.

## The CINAP approach

The current health centre-based focus of internationally driven initiatives to manage malnutrition largely focus on wasting reduction. Although integrating nutrition into agriculture programmes is not new, its success so far has been mixed in terms of impact on nutrition outcomes, such as stunting. Given this, the CINAP approach aims to place a stronger nutrition component within agriculture programmes at household/community level. For a multi-sector approach, the model also comprises a water, sanitation and hygiene (WASH) component to reduce the risk of illnesses, including gastric/diarrhoeal illnesses, which are known to further exacerbate malnutrition. Links are also developed with the nearest health centres for both curative and preventative healthcare.

<sup>1</sup> This is a follow-on paper from an article published in FEX issue 51 (Feb 2016) titled Nutrition-Sensitive Agriculture in Zambia: work in progress

**Figure 1** Map of key nutrition-sensitive agriculture projects in Zambia



### Nutrition component

The core of this model is a combination of nutrition-sensitive and nutrition-specific interventions within agriculture programmes at community level, with a focus on women of reproductive age, infants and young children. Nutrition-specific interventions that can be undertaken at community level, which are key to the model promoted by SHA, include promotion of improved Infant and Young Child Feeding (IYCF) practices through the training of beneficiaries within the community and the formation of mother-to-mother support groups. Other interventions include support for vitamin A supplementation for children aged 6-59 months, supplied by health centre staff.

### WASH component

An initial small WASH component included within the IYCF training was strengthened following the results of a knowledge, attitude and practice (KAP) survey, which showed poor personal, household and community hygiene and sanitation practices. SHA subsequently collaborated with World Vision (WV) and the Zambia Ministry of Water Sanitation and Environmental Protection to strengthen this component. WV initiated a community-led total sanitation (CLTS) approach, which complemented the community nutrition approach well. Emphasis is on aspects of improving environmental sanitation, construction of 'tippy-taps', improved latrines and drying racks, together with improved personal and household hygiene practices.

### Agricultural component

Key components were integrated into the nutrition-sensitive agriculture intervention to support improved household food and nutrition security. Training was delivered to farmer groups using a training-of-trainers (TOT) approach, covering a variety of elements. These included production of higher quality and quantity of diverse crops with a specific focus on pulses and vegetables; improved small livestock husbandry; understanding of food groups and the need for a balanced diet; and better utilisation of food at the household level, in combination with developing local recipes and basic cooking demonstrations. Training on improved

post-harvest handling and storage practices was also provided to improve shelf-life of food and reducing wastage and spoiling.

### Programme implementation

#### Community groups

Following an initial contextual analysis and baseline study, a wealth-ranking exercise was conducted to assist with beneficiary identification. Within the identified communities, individuals were selected for participation in the programme (individual household methodology was used) and groups were formed, called Livelihood Enhancement Groups (LEGs). Each group comprised around 45 members, with an average of 60% female participants. Each group received initial training on group dynamics.

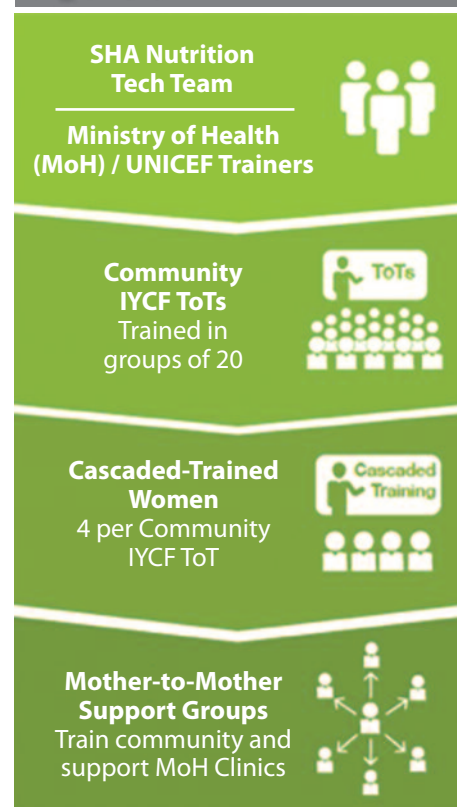
Different members within each group received specific training on a variety of agricultural/livelihood practices, including the principles of conservation farming, benefits of crop rotation, minimum tillage, education on intercropping and introducing new crops and better varieties. Members also received training on good practices in small animal husbandry. They were then tasked with cascading the training to others within their group. Some LEG members received inputs such as seeds and small animals (such as goats and chickens) to receive and pass on to others.

#### Evolution of nutrition component

The nutrition component of the programme evolved over time. Initially the programme collected data on dietary diversity (DD) using a modified World Food Programme (WFP) household Food Consumption Score (FCS) tool. The purpose of this was to gain an understanding of the variety of foods being consumed within households. The results from the FCS undertaken in November/December 2013 indicated that, in Luwingu, only 62% of surveyed households had an "acceptable" DD score (consuming a basic acceptable variety of food groups). Consequently, the first activities to be rolled out were promoting the production of a greater variety of foods and growing different varieties of pulses, small livestock rearing, and basic nutrition education.

In mid-2014 a KAP study was completed in Mbala district; a nutrition survey was conducted in Luwingu district in November/December of the same year. The results from these studies indicated that the nutritional situation was extremely poor, with levels of stunting in children under five years old at 53.4% and severe stunting at 26.6% in Luwingu district. IYCF practices were also very poor, with early initiation of breastfeeding at 53%, exclusive breastfeeding up to six months at 55%, and extremely poor levels of consumption of acceptable quality and quantity of complementary foods (17% and 48% respectively). WASH practices were also concerning. There was little understanding of the need to wash hands at critical times (before preparing food, before eating and after using the toilet) and how to make drinking water safe. There were also very high levels of illiteracy among women. Based on these results, it was

**Figure 2** Description of nutrition component of the programme



decided that there was a need for a more comprehensive nutrition and WASH intervention within the programme.

The nutrition-specific IYCF training was considered a "grass-roots" training of community members (Figure 2). A six-day residential training was conducted. Initially one to two women from each LEG were trained, but over time it became apparent that a more gender-balanced approach was needed. Influential men were therefore included in the training at a later stage, with very positive results. This training was the official Ministry of Health (MoH)/ UNICEF training usually conducted with health staff rather than communities, slightly modified by UNICEF/MoH and translated into local dialects (Bemba and Mambwe) by SHA (see Box 1). The training was conducted with groups of 20 by the official MoH/UNICEF master trainers. Informal feedback from staff, community members and MOH suggests the training empowers those trained, who are then recognised by their peers as having received significant useful knowledge. These IYCF-trained community members then conducted 'cascade training' with four to five other members each (mainly women) within their communities. This led to the formation of mother-to-mother support groups, through which nutrition information and training could be shared and cooking demonstrations provided to specific vulnerable groups.

Over time, community IYCF-trained workers were linked with their nearest health centres and tasked with providing the centres with monthly activity reports. Some community IYCF trainers also attended the antenatal and under-

### Box 1 Main components of the IYCF training

- Nutrition during pregnancy
- Early initiation of breast-feeding and importance of exclusive breast-feeding for six months, including the dangers of mixed feeding
- Good attachment to the breast and breastfeeding on demand
- Breastfeeding and working mothers
- Good hygiene practices
- Introducing complementary feeding – quality and quantity at different ages between 6 and 24 months (variety of foods, etc.)
- Feeding the sick infant and young child under six months and from 6 to 24 months and when to take them to a health centre
- HIV/AIDs and feeding infants and young children aged 0 to 24 months
- Growth monitoring



**Table 1** Self Help Africa nutrition survey results 2014 and 2017

Height for Age z-score	2014	2017	DHS 2013-14 Northern Province
Prevalence of stunting < 5 years	53.4% C.I. (47.8-59.0)	50.7% C.I. (44.4-56.9)	48.5%
Between -2-3 z-score (moderate)	26.9% C.I. (23.4-30.4)	25.8% C.I. (22.2-29.7)	24.9%
Below -3 z-score (severe)	26.5% C.I. (20.7-32.3)	24.9% C.I. (18.8-32.2)	23.6%
Stunting < 18mths	38.5%	31.4% C.I. (23.1-41.0)	
Between -2-3 z-score (moderate)	19.7%	20.4% C.I. (14.3-28.3)	
Below -3 z-score (severe)	18.8%	10.9% C.I. (6-19.1)	

five health days in their local health centre and provided support to health centre staff. Some community IYCF trainers also conducted nutrition screening at community level, doing regular mid-upper arm circumference (MUAC) screenings and referring children identified with malnutrition to the nearest health centre, or providing support and education to mothers and caregivers on nutrition within their community. Over 500 LEG members received the community IYCF TOT training; over 2,600 community members received cascaded training.

In addition to the strong general agriculture education within the LEGs, a component on growing vegetables and fruit trees (kitchen gar-

dens) was added to the curriculum later, within the mother-to-mother support groups.

**Results**

Several studies were completed to measure the impact of the various interventions in mid-2017, towards the end of the five-year programme. A repeat nutrition survey after two and a half years showed significant improvements in stunting trends among children under 18 months, with levels decreasing from 38.5% in November/December 2014 to 31.4% in April 2017 (Table 1). A change in the ratio of moderate to severe stunting was also observed. In the 2014 study the ratio of moderate to severe stunting was 1:1, while in 2017 this had changed to 2:1, meaning far fewer

cases of severe stunting. Due to the overlap in confidence intervals it is not possible to say that the results are statistically significant. This may be due to two factors – the sample size of infants less than 18 months was small (119 in 2014 and 130 in 2017) and the timeframe was short between surveys (< 2.5 years).

A considerable change in stunting prevalence in children under five years old was not captured, but this is possibly also due to the short timeframe. In reality, the older children in the second study (over two and a half years) were likely to have been stunted before the CINAP intervention started and did not benefit from the stronger nutrition component.

In terms of IYCF practices, some statistically significant improvements were reported in the repeat KAP survey, particularly in relation to pregnant women attending ante-natal services at least three times during pregnancy; mothers initiating breastfeeding within one hour of delivery; and exclusive breastfeeding to six months (Figure 3). There were also statistically significant improvements in complementary feeding practices, with increases in both the quantity and quality of meals provided to children aged from 6 to 24 months. Improvements were also recorded in WASH practices, including the use of latrines, ‘tippy-taps’ and drying racks. There was also a notable increase in the treatment of water to make it safe for drinking.

Household DD also improved over the lifetime of the programme. The introduction of pulses in Luwingu, together with training on their nutritional value and use, was an important factor. Between 2013 and 2017 the number of days pulses were being consumed within households increased from 2.2 to 4.6 days. This is particularly important as pulses are a nutritionally valuable crop, especially where the diet is lacking in other good sources of protein, such as fish, meat, eggs and dairy.

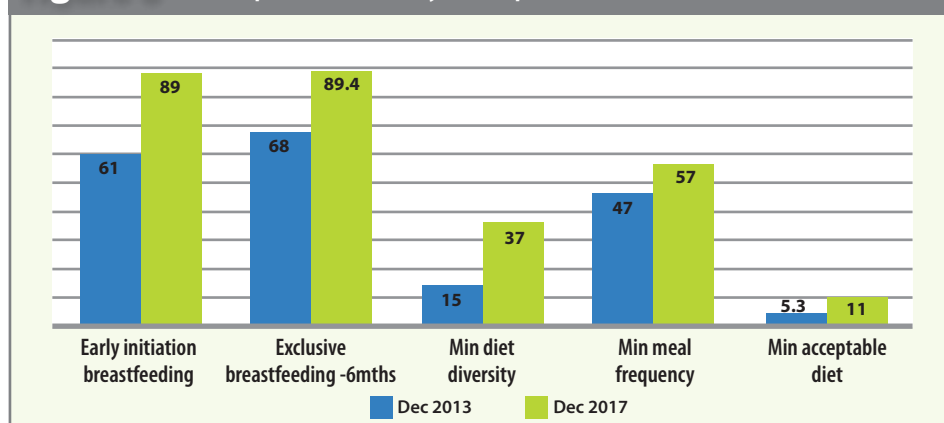
It is important to note that there are also seasonal variations in data, particularly where there is only one dominant harvest, and the population is dependent on what is available locally. These factors can affect FCS score results significantly. In 2013 the FCS was taken at the beginning of the hunger gap, while in 2017 it was taken towards the end of the hunger gap, when food was less available. This is particularly important where communities are hugely dependent on own produce for food needs and where markets are very limited, as is the case with Northern Province in Zambia.

**Lessons learned**

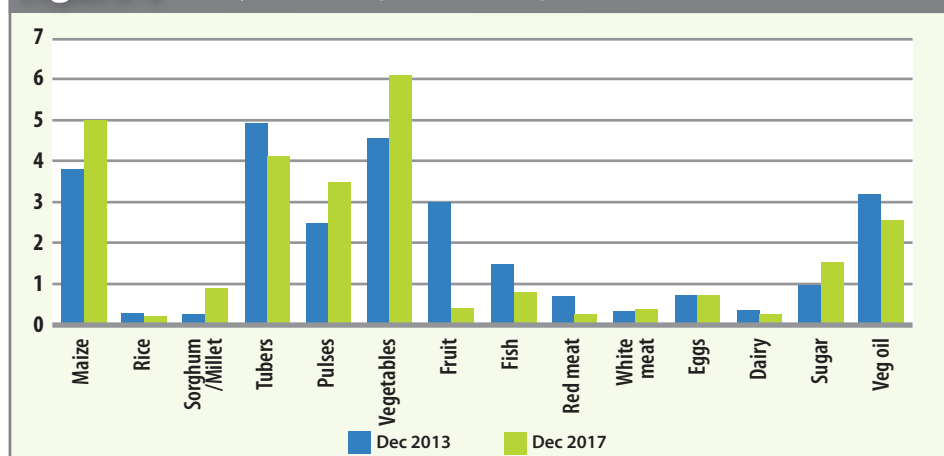
Key lessons that have emerged from this initiative include:

- Embedding nutrition within the community through basic nutrition and WASH training – particularly IYCF practices – appears to have substantially improved nutrition and hygiene practices.
- Implementing both agriculture and nutrition interventions together helped connect these sectors, converging at the household level.

**Figure 3** Self Help Africa KAP survey of ICYF practices in Mbala District



**Figure 4** Variety of Food Groups Consumed – April 2017 and December 2013





- Where a SUN initiative exists, linkages should be made to further enhance stakeholder coordination (SUN was being established in one district soon after the IALDP commenced; over time this helped to improve coordination).

Box 2 describes essential components of the CINAP programme to provide learning for other nutrition-sensitive agricultural programmes.

## Consolidation and exit

The current final year is focused on consolidation and exiting from the community and health systems by the SHA nutritionist. Within the two districts there are 19 health centres (HC) and attached to each health facility is a Rural Advisory Committee (RAC). Initially, a mapping will be undertaken to get details on personnel in the HC and the RAC. Details will be obtained regarding whether the RAC is functioning and what support is required. Capacity-building will be done with the RACs where necessary on basic taking of minutes of meetings, giving some basic material. A two-day training/sanitation will be delivered with health staff and RAC members in each HC on the IYCF IALDP model. Training on use of height boards and MUAC tapes will be conducted and these materials supplied to each HC. Training on the nutrition community referral system will be conducted (screening and referring cases with low MUAC). The SHA nutritionist will also participate in the quarterly district nutrition coordinating committee (DNCC).

## Conclusions

Several factors influenced the success of the programme in Northern Zambia. These include: the willingness of the local authorities to work with SHA and this development programme, which led to close collaboration between the MoH and the Ministry of Agriculture; the presence of SHA technical staff on the ground to support the programme; and the fact that a strong agriculture component aimed at improving food security was being implemented even prior to commencing the nutrition components<sup>2</sup>. A recent study conducted by SHA with staff and other implementing partners highlighted the importance of a strong agriculture element to support improvements in nutrition (improving food security strongly linked with improving nutrition). The community involved in the programme felt that by improving food security, it was possible to make improvements in nutrition practices. This laid the foundations for strengthening nutrition. Close collaboration with another NGO specialising in WASH was also key to strengthening those aspects in the programme through CLTS; again this component had a bottom-up approach – embedding it within the community.

For more information, please contact Mary Corbett at [mary.corbett@selfhelpafrica.net](mailto:mary.corbett@selfhelpafrica.net)

SHA technical staff understood and supported both areas and the need for integration for maximum results.

- Integrating nutrition into agricultural interventions is fundamental to improving food security by improving quality, quantity and diversity of food and ultimately utilisation, contributing to improved nutrition outcomes.
- During this intervention, SHA linked with the MoH from the start in terms of training and resources/material adaptation. However, the programme was not linked at health centre level, which was a flaw in hindsight, although this was rectified as time went on.
- The programme was linked with the Scaling Up Nutrition (SUN) Movement in Mbala district as SUN was being established there. It took time for this relationship to evolve, partly because SHA was not a known

health/nutrition stakeholder.

- A positive learning point was the use of a slightly modified version of the IYCF training material that was developed by the MoH/UNICEF, as well as their approved trainers. This led to the training being accepted and acknowledged by the MoH and ultimately added weight to the model and improved its sustainability. IYCF TOTs received certificates from the regional MoH.
- Training should be simple, basic and practical, particularly when targeting communities with poor literacy levels. Cooking demonstrations were highly appreciated.
- In future nutrition surveys the sample should possibly comprise children under 24 months old, rather than under 59 months old, as a substantial amount of malnutrition occurs within the first 24 months of life.

## Box 2 Essential components of the CINAP model of a nutrition-sensitive agriculture programme

**1 Context analysis:** Starting with an in-depth contextual and stakeholder analysis to ensure that interventions are appropriate and respond to local needs and that relevant stakeholders are involved and well coordinated at the early stages of programme design.

**2 Nutrition-specific training:** This training should focus on the nutrition and health needs of vulnerable groups within the community, especially PLW and children under 24 months old. Where possible, it should involve MoH/UNICEF-accredited trainers.

**3 Nutrition-sensitive programming:** The integration of nutrition within agriculture programming is essential to improve food security. Increased production, diversity and utilisation of food, together with nutrition knowledge and behaviour change, are key to improving nutrition outcomes.

**4 Working with different line ministries:** Working with government ministries across different sectors (especially the ministries of health, agriculture and local government) allows for a more comprehensive lens in approaching nutrition needs at different levels and increases the potential for real collaboration on the ground contributing to long-term sustainability and positive impact.

**5 Working closely with nutrition coordination committees at district and sub-district level:** These committees should be established where they don't already exist (often within the context of the SUN Movement) and should comprise members from the relevant line ministries at district-level, together with other stakeholders, including non-governmental organisations (NGOs). They should be tasked with planning and coordination of activities to support improved nutrition outcomes.

**6 Linking with community health centres:** Community IYCF trainers should be strongly linked to their nearest health centre, as this collaboration ensures that health centre personnel are aware of community needs. In cases where the health centre capacity is limited, IYCF-trained people within the community are encouraged to support the centre, particularly during child health days.

**7 Simple monitoring and evaluation (M&E) tools:** Simple M&E methodologies should be developed in collaboration with the MoH and should adequately reflect the activities being undertaken by IYCF trainers at community level. These tools should be submitted to the nearest health centre and shared with NGOs and other stakeholders.

**8 Gender inclusion:** Ensuring equal participation of men and women in the programme is key. In particular, it is important to ensure that influential men within the community partake in the various nutrition training as this will support buy-in and lead to positive change; men need to understand that nutrition is not just a 'woman's issue'.

**9 Translating material into local dialect and use of pictorial/visual aids:** Identifying diverse and creative ways to enhance knowledge transfer, including cooking demonstrations and role play, is important, particularly where literacy is an issue; having visual aids also gives further legitimacy to the community IYCF trainers.

**10 Promoting basic WASH practices:** This should focus on the promotion of good hygiene and sanitation practices at individual, household and community level, including aspects such as hand-washing at critical times, safe drinking water, food safety (processing, storage), refuse disposal, and disposal of human excreta. Collaboration with stakeholders working on WASH systems and infrastructure should be pursued.

<sup>1</sup> This was not intentional but proved to be a key element of success. Our recommendation would be for the two components to start at the same time.

## Report on innovations in CMAM

By Anne Marie Kueter, Claudine Prudhon, Emily Keane and Megan Gayford, Save the Children



A child consumes RUTF at a WFP supported programme in Gok Machar, Northern Bahr el Ghazal, South Sudan, 2016

The implementation of community-based management of acute malnutrition (CMAM) as the standard model of care for children with acute malnutrition has significantly increased cost-effectiveness of treatment and the potential for larger coverage, largely due to a shift from inpatient to outpatient management. However, in places where CMAM services are available, coverage is still not optimal. Distance and high opportunity costs in seeking treatment have consistently been reported as the top barriers to access (Puet et al, 2013). It has been reported that less than 20% of children with moderate acute malnutrition (MAM) and severe acute malnutrition (SAM) are receiving treatment (CORTASAM, 2018).

In recent years new methods have been developed, tested and implemented to simplify or improve the classic CMAM model to increase coverage and cost-effectiveness, facilitate implementation in a humanitarian emergency and facilitate implementation by a health system. A Save the Children (SC) report (updated July 2018) on these innovations in CMAM provides an overview of newly developed methods and approaches, including evidence of their effectiveness, country experiences, available guidance and an overview of on-going initiatives. The report covers the following innovative approaches:

**Expanded admission criteria:** Provides temporary options for combining treatment of SAM and MAM children. This approach is sometimes implemented in emergency settings in the absence of either an outpatient therapeutic programme (OTP) or targeted supplementary feeding programme (TSFP). The World Food Programme (WFP) and UNICEF authored *Moderate Acute Malnutrition: A Decision Tool For Emergencies*<sup>1</sup>, which covers the expanded admission criteria.

**Integrated treatment protocols for SAM and MAM:** This is similar to the expanded admission criteria, but rather than being developed in response to crisis, is the result of a weighing up of the costs/benefits of integration. Different versions of this approach have been implemented in Niger

and Sierra Leone and this method is currently being researched through various studies, including the Combined Protocol for Acute Malnutrition Study (CompAS) – a cluster-randomised controlled trial in South Sudan and Kenya using a simplified mid-upper arm circumference (MUAC)-based dosage chart for the treatment of both SAM and MAM (Bailey et al, 2018). The Mango Study<sup>2</sup> run by Action Against Hunger (AAH) in Burkina Faso and a MUAC-only study run by ALIMA in Burkina Faso are both researching similar methods.

**Using MUAC only as admission criteria and mothers using MUAC to screen their children:**

Available evidence for the use of MUAC-only programming is covered in the report as well as available evidence and guidance<sup>3</sup> developed by ALIMA on the training of mothers to measure MUAC. A recent recommendation of CORTASAM for No Wasted Lives supporting these approaches states that: “MUAC should be used as the primary tool for the detection and discharge of acute malnutrition in children 6-59 months of age in the community.” (CORTASAM, No Wasted Lives, 2018).

**Integration of treatment of acute malnutrition into integrated community case management (ICCM):**

This method has been researched by AAH through the C-Project in Mali and Pakistan (details included in full report) and SC has conducted operations research in Kenya in collaboration with AAH. In line with this approach, International Relief Committee (IRC) has developed a simplified protocol and tools for low-literacy health workers to treat SAM, based on several years of field testing in South Sudan.

**Community-based management of at-risk mothers and infants under six months (C-MAMI):**

In 2009 the C-MAMI project published a report on the management of acutely malnourished infants under six months of age. Since then SC has partnered with a number of agencies to improve knowledge and evidence on the management of acute malnutrition in infants. Research is still ongoing in Bangladesh, where the C-MAMI tool developed by ENN, LSHTM, SC and collabo-

rators in 2015 is being tested in both development context as well as in emergencies during the current Rohingya response (see field article in the MAMI special section of this issue). Version 2 of the C-MAMI tool has recently been launched (see news item in MAMI special section).

**CMAM mHealth:** World Vision, together with implementing partners International Medical Corps (IMC) and SC, have developed a CMAM mHealth app that guides health workers through CMAM protocols and provides accurate and timely data to improve programme quality and efficiency (Keane et al, 2018; Frank et al, 2017). The application was piloted in Chad, Kenya, Mali, Niger and Afghanistan between 2014 and 2016. There are no specific on-going activities, but there is intent in principle to continue collaboration between SC and World Vision if further funding can be identified.

**CMAM surge approach:** One of the main goals of this approach is to build the resilience of health systems over time by making them better able to cope with periodic peaks in demand for services for acute malnutrition without undermining the capacity and accountability of government health actors. Concern Worldwide was the first to start a pilot project (in Kenya from 2012 till 2014) and has developed an operational guide as well as a facilitators’ guide<sup>4</sup>. Save the Children is currently supporting implementation of this approach in Mali.

An updated version of the review has been completed in July and can be downloaded from: <https://www.enonline.net/resources/innovationscmam>

For more information, please contact Claudine Prudhon at [c.prudhon@savethechildren.org.uk](mailto:c.prudhon@savethechildren.org.uk)

<sup>1</sup> <https://reliefweb.int/report/world/moderate-acute-malnutrition-decision-tool-emergencies>  
<sup>2</sup> [www.actioncontrelafaim.org/en/mango-project/](http://www.actioncontrelafaim.org/en/mango-project/)  
<sup>3</sup> [www.alima-ngo.org/empowering-mothers-prevent-malnutrition](http://www.alima-ngo.org/empowering-mothers-prevent-malnutrition)  
<sup>4</sup> [www.concern.net/resources/cmam-surge-approach](http://www.concern.net/resources/cmam-surge-approach)

### References

Bailey et al, *Combined Protocol for Acute Malnutrition Study (CompAS) in rural South Sudan and urban Kenya: study protocol for a randomized controlled trial*. *Trials*, April 2018

CORTASAM 2018. *Research Agenda for Acute Malnutrition. A Statement from the Council of Research & Technical Advice on Acute Malnutrition (CORTASAM)*, No Wasted Lives, 2018.

Frank T, Keane E, Roschnik N, Emary C, O’Leary M and Snyder L (2017). *Developing a mobile health app to manage acute malnutrition: a five-country experience*. *Field Exchange* 54, February 2017. p7. [www.enonline.net/fex/54/mobilehealthapp](http://www.enonline.net/fex/54/mobilehealthapp)

Keane E, Roschnik N, Chui J, Osman IA and Osman HM (2018). *Evaluation of mobile application to support the treatment of acutely malnourished children in Wajir county, Kenya*. *Field Exchange* 57, March 2018. p61. [www.enonline.net/fex/57/mobileappsmalnutkenya](http://www.enonline.net/fex/57/mobileappsmalnutkenya)

Puet C, Hauenstein Swan S & Guerrero S. (2013). *Access for All, Volume 2: What factors influence access to community based treatment of severe acute malnutrition?* (Coverage Monitoring Network, London, November 2013)

# Adolescent Nutrition Interest Group meeting



A one-day meeting of the Adolescent Nutrition Interest Group (ANIG) was held in London on 12 December 2017. The meeting was co-hosted by Emergency Nutrition Network (ENN), London School of Hygiene & Tropical Medicine (LSHTM) and Save the Children, with funding from Irish Aid (via ENN). A background paper was prepared by ENN for the meeting, synthesising the evidence to date for adolescent nutrition, key gaps and opportunities ([www.ennonline.net/adolescentmeetingsynthesis](http://www.ennonline.net/adolescentmeetingsynthesis)). The meeting aimed to build on the upsurge of attention currently surrounding adolescents and establish an interest group with the following aims: identify emerging research and operational experiences; disseminate existing data with potential for analysis from an adolescent nutrition perspective; help 'bridge' the disciplines of health and nutrition by facilitating discussion and learning; and facilitate potential future collaborations, including funding opportunities.

Interested operational agencies, United Nations staff, researchers and academics were invited to join programmers at the meeting. There were 29 participants in total, including two remotely. Presentations and discussions were focused around three interconnected themes: populations, interventions and outcomes. Twelve presentations were given in the morning covering a range of topics. In the afternoon a prioritisation exercise was conducted to identify top research and operational priorities in this area. Headlines are summarised below.

Adolescents are defined by the World Health Organization (WHO) as the population between the ages of 10 and 19 years. However, this definition masks a diverse group, whose needs vary according to age, gender and urban/rural context, requiring a range of tailored interventions and approaches and measurement by specific outcomes, both structural and functional. Categorisation by age may be meaningless in many contexts where adolescents are more commonly defined by social standing and/or grade in school. It is critical to target boys and girls, although in view of the seriousness and far-reaching nature of the consequences, preventing early marriage and delaying pregnancy in younger girls must be considered the top priority.

Adolescent girls remain nutritionally vulnerable, suffering from persistently high rates of underweight, increasing prevalence of overweight and obesity, and micronutrient deficiencies (particularly anaemia). During the meeting, the World Food Programme (WFP) highlighted the fact that an adolescent girls' diet is the most costly (or is on a par with that of a lactating woman) in every

country and this cost increases even more with pregnancy. This reflects the high nutritional requirements of adolescent girls and the fact that the necessary nutrients are usually only found in relatively expensive foods. Another reason to focus on this group is that there is compelling evidence to believe it is worth the investment, both for this generation and, through adolescents' role as future parents, for generations to come. Adolescence also provides a possible window for catch-up growth; research indicates that this also has repercussions for the next generation. There are currently many gaps in our knowledge and it is critical that we start to fill them to address adolescents' needs more effectively.

Several important issues were raised for consideration during discussions on what we want to achieve when working with adolescents. While physical outcomes are important, it does not matter per se whether the individual is short or tall. What matters are the associated risks: height and body mass index are important predictors of risk of birth obstruction and non-communicable diseases. It is also important to take a lifecycle approach; inter-generational cycles are not solely about biology, and adolescence provides great opportunities to reset norms. Cognitive outcomes are critical, but we need to improve tools to measure these effectively. More discussion is needed on the cost-effectiveness of addressing the nutritional needs of this age group (in comparison with investments for the first 1,000 days). It is important to remember that there can be considerable risks with interventions in this age group. Improving nutrition in younger adolescent girls can lead to early puberty, potentially leading to earlier age at first pregnancy, with associated risks, and shorter and more overweight individuals. Randomised controlled trials are needed to understand this better.

During discussions, three platforms were identified for interventions in this age group, as well as associated challenges, as follows:

**Health** – Adolescents have many competing priorities, particularly older adolescents aged 15 to 19 years; health is often seen as a long-term issue which can be put to one side for the time being and public health messaging may not be a primary source of information for adolescents.

**Schools** – Landscape-mapping in Bangladesh found schools to be the most promising platform to reach adolescents, while working with adolescents as agents of change and using participatory methods also show great promise.

**Peer-to-peer work** – The influence of peer opinion, particularly among older adolescents, is very important to consider in adolescent programming and research.

Reaching adolescents through other sector platforms (e.g. through sexual reproductive health and avoiding early marriage) and other nutrition-sensitive programmes may provide the most effective channels for improving adolescent nutrition. There is a need to consider social aspects when intervening, engaging with young people's experiences and the vital role of the education system in changing household behaviour. It is critical for the nutrition community to learn from others who have already pioneered work on how to engage with adolescents successfully, such as in education and HIV prevention.

For each of the three themes (populations, interventions and outcomes), operational and research priorities were discussed and identified by participants, with a voting system to choose the most important. The overall research priority identified was how to engage adolescents effectively. The overall operational priority identified was using age at first pregnancy as an outcome of interventions. The group felt that these priorities need to be considered alongside those coming from the SPRING/USAID /PAHO consultation held in October 2017, summarised in the presentation by the SPRING representative.

At the end of the meeting, discussions were held regarding future plans. The organisers expressed hope that this is the start of a group which will work together to address many of the issues discussed at the meeting. Regular calls (once every four months) were proposed to move forward recommendations, to which all participants were welcomed. ENN will initiate this and write a terms of reference for the group. Other ways forward proposed included:

- Creation of an adolescent thematic area on ENN's online forum, en-net. Two or three expert moderators will need to be recruited for this. (This has been launched; see: [www.en-net.org](http://www.en-net.org))
- Potential creation of a 'closed discussion group' through ENN's new initiative; Nutrition Groups ([www.nutritiongroups.org/](http://www.nutritiongroups.org/))
- Investigate the potential for a nutrition group within the Lancet Commission on Adolescent Health.
- Reach out to and link the various initiatives gathering momentum on adolescents (such as this group, SPRING, WHO and Lancet).
- Organise a gathering every year or two in a similar vein to the Management of at risk Mothers and Infants (MAMI) Special Interest Group ([www.ennonline.net/ourwork/research/mami](http://www.ennonline.net/ourwork/research/mami)).
- Think about how to address the reasons why adolescent nutrition has been neglected and why little has moved forward to date, including: Who has responsibility for this age group? Who is championing their needs? What is the hierarchy of needs and where to start?

The full meeting report can be downloaded at [www.ennonline.net/adolescentmeeting2017](http://www.ennonline.net/adolescentmeeting2017)

For more information please contact Emily Mates at [emily@ennonline.net](mailto:emily@ennonline.net)

# Child wasting and stunting: Time to overcome the separation



**A** briefing note for policy-makers and programme implementers was released in June 2018 by the ENN-coordinated Wasting-Stunting Technical Interest Group (WaSt TIG). The brief, which is a culmination of their research and deliberations over the last four years, highlights that, in recent decades, the nutrition community has separated child wasting and stunting along the humanitarian/development divide. This has resulted in different policies, programmes, research and funding for these two manifestations of child undernutrition. For example, programmes treating wasting have been largely funded and managed separately from those focused on preventing stunting. In the brief, the WaSt TIG concludes that there are compelling scientific grounds for concluding that this separation is not justified and may even be detrimental. They group suggests that greater programming efficiency and effectiveness can be realised if both forms of undernutrition are jointly tackled. This will require a radical change in how we view, finance and intervene to reduce child wasting and stunting.

Recent research highlighted in the brief shows that wasting and stunting share common risk factors; are both important in most contexts; impact on each other; and share common consequences. There is also evidence that large numbers of children suffer from wasting and stunting at the same time; that boys are more vulnerable to both wasting and stunting; and that there are seasonal patterns in wasting and stunting that are related.

## Implications of the findings

1. We need to accelerate efforts to reduce wasting and stunting in all contexts where they are prevalent. This requires overcoming barriers which limit the focus in humanitarian response to the treatment of wasting and the prevention of stunting as the main focus of development efforts.
2. Because wasting and stunting share many of the same risk factors, we need greater integration of preventative activities and need to monitor and evaluate programme impacts on both manifestations of undernutrition and their crossover (concurrence).
3. The current low level of global coverage for the treatment of wasting is likely to be limiting the height growth of millions of infants and children by prolonging the period over which their growth slows down or halts completely; therefore scale-up of efficacious treatment should be a priority – not just for mortality reduction but for stunting reduction as well.
4. Traditional categories for targeting therapeutic and supplementary programmes need to be challenged, based on a better understanding of mortality risk. Infants and children who are at most risk (including the concurrently wasted and stunted) should be prioritised for intervention. These children can be identified with existing methods; however more work is needed on the optimal ways to detect and treat them

and on the resource and programme implications.

5. In view of the influence of season on wasting and stunting, timely interventions to prevent peaks are needed. Linking up services, whether social protection, health, nutrition or WASH, will better enable the multiple risk factors driving seasonal peaks in child under nutrition to be addressed simultaneously.
6. Given that maternal health and nutrition influence both weight and length at birth and subsequent child growth, we need to expand support to women not only for improved infant and child nutrition, but also to confer health and nutrition benefits directly on mothers.
7. In most contexts, boys are more wasted and stunted than girls. The reasons for this are unknown, but at a policy level this widespread finding indicates that common narratives around gender and heightened vulnerability of girls to malnutrition need to be revised.

The full policy brief is available from: [www.ennonline.net/resources/timetoovercometheseperation](http://www.ennonline.net/resources/timetoovercometheseperation)  
For more information please contact Tanya Khara at [tanya@ennonline.net](mailto:tanya@ennonline.net)

## Revised CMAM Training Guide

**T**he Food and Nutrition Technical Assistance III Project (FANTA), in collaboration with partners (Action Against Hunger, Alliance for International Medical Action (ALIMA), Concern Worldwide, Emergency Nutrition Network (ENN), International Medical Corps (IMC), International Rescue Committee (IRC), Management of At-risk Mothers and Infants under 6 months (MAMI) Special Interest Group, Save the Children, UNICEF, United States Agency for International Development (USAID), World Health Organization (WHO) and World Vision) have updated the CMAM Training Guide to reflect the latest guidance and emerging evidence on the management of acute malnutrition. The updated guide is designed for healthcare managers and healthcare providers who manage, supervise and implement CMAM in both emergency and non-emergency contexts.

The 2018 update reflects guidance and recommendations provided in the following publica-

tions and tools: Updates on the Management of Severe Acute Malnutrition in Infants and Children (WHO 2013); Updates on HIV and Infant Feeding (WHO 2016); Technical Note on Supplementary foods for the management of moderate acute malnutrition in infants and children 6–59 months of age (WHO 2012); Joint Statement on WHO child growth standards and the identification of SAM in infants and children (WHO/UNICEF 2009), and Community based management of at-risk mothers and infants under 6 months (C-MAMI) Tool version 2.0 (ENN, LSHTM, Save the Children, GOAL, MAMI Special Interest Group, July 2018). It also provides additional guidance based on the most recent evidence, lessons learned and best practice.

Below are highlights of the changes made to the Training Guide:

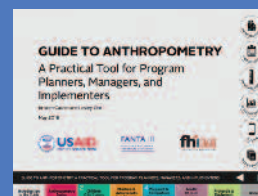
- Identification, admission and discharge of children aged six months to five years with acute malnutrition using mid-upper arm circumference (MUAC) and bilateral pitting oedema as the primary criteria in the community for the initial screening of acute malnutrition and referral for treatment. The use of weight-for-height/weight-for-length (WFH/WFL) for admission and discharge is also included.
- Training of mothers and caregivers on MUAC

- measurement and assessment of bilateral pitting oedema of their children to facilitate early case detection and referral for treatment.
- Vitamin A supplementation in the treatment of severe acute malnutrition (SAM).
- Management of HIV-infected children with SAM.
- Inclusion of assessment and case management of at-risk mothers and infants under six months of age.
- The use of the combined protocol for SAM and moderate acute malnutrition (MAM) treatment.
- Strengthening the health system, including planning and managing increased demand for acute malnutrition.

Ongoing research and emerging evidence on the management of acute malnutrition is anticipated to become available between 2018 and 2020. Where necessary, online links to research and global discussions on specific topic areas have been provided in each Training Guide module. Additional emerging issues not included in this revision will be documented for future revisions.

The Revised Training Guide for CMAM, 2018 can be download from the FANTA website at: [www.fantaproject.org/focus-areas/nutrition-emergencies-mam/cmam-training](http://www.fantaproject.org/focus-areas/nutrition-emergencies-mam/cmam-training)

## Guide to anthropometry: A practical tool for programme planners, managers and implementers



**F**ANTA has revised its *Guide to anthropometry: a practical tool for program planners, managers and implementers*.

This user-friendly resource offers up-to-date information and step-by-step instructions on using anthropometry to assess the nutritional status of individuals and communities. The guide, which replaces the 2003 Anthropometric indicators measurement guide, explains anthropometric measurements and indices and the nutrition conditions that they assess in different demo-

graphic groups. It also discusses how to interpret anthropometric data and offers guidance on selecting equipment for taking measurements in low-resource settings.

This resource can be used to better collect, understand and use anthropometric data as part of service provision, surveillance, surveys, monitoring and evaluation, and programme design. Its guidance is based on important developments in assessing nutritional status, including the 2006 World Health Organization (WHO) child growth

standards for children from birth to five years, the 2007 WHO Growth Reference for children aged 5 to 19 years, and the use of mid-upper arm circumference (MUAC) as a key indicator for acute malnutrition. The guide also covers adolescents and adults, reflecting growing attention on the health and nutrition of these groups in developing countries.

Access the guide from: [www.fantaproject.org/tools/anthropometry-guide](http://www.fantaproject.org/tools/anthropometry-guide)

## Global humanitarian assistance report 2018



**A**n estimated 201 million people in 134 countries needed international humanitarian assistance in 2017, a fifth of whom were in just three countries – Syria, Yemen and Turkey. A small number of complex crises continue to absorb the majority of humanitarian assistance: 60% of all assistance was channelled to ten countries only, with 14% going to Syria, the largest recipient, and 8% to Yemen, the second-largest. Conflict continues to feature as the main contributor to humanitarian need.

A record US\$ 27.3 billion was allocated to humanitarian response, yet the rate of growth of humanitarian assistance continues to slow, with only a 3% increase for the second consecutive year (following increases of 20% and 16% respectively in 2014 and 2015). Whilst contributions from governments and European Union institutions only grew by 1.4%, private donors increased their contributions by 9% (the largest proportion of which came from individuals).

The amount requested by 41 UN-coordinated appeals in 2017 reached a high of US\$25.2 billion, driven by ongoing crises in Syria, Yemen, Somalia and Nigeria, and new large appeals in Ethiopia and Pakistan. These appeals saw a record response of US\$14.9 billion, but a funding shortfall of 41%, the largest to date.

In 2016, US\$12.3 billion or 60% of all direct government funding went to multilat-

eral agencies (primarily United Nations agencies) in the first instance. Non-governmental organisations (NGOs) received US\$4.0 billion directly – 20% of the total. A growing majority of this went to international NGOs, who received 94% of all funding to NGOs in 2017, up from 85% in 2016. There was a slight increase in direct funding to national and local NGOs, from 1.7% of all NGO funding in 2016 to 2.7% in 2017. But local and national NGOs received just 0.4% directly of all international humanitarian assistance reported to the Financial Tracking Service in 2017, a rise of just 0.1% from 2016. Improved reporting, with lower volumes of funding being categorised as ‘undefined’, may in part explain the changes seen in 2017.

Funding volumes through the flexible funding mechanisms termed pooled funds continue to grow, reaching a record total of US\$1.3 billion in 2017. Consistent and comparable data on multi-year funding remains unavailable, but a review of UN-coordinated appeals suggests an increase in the volume of requirements for multi-year appeals, despite a reduction in their number. An estimated US\$2.8 billion of international humanitarian assistance was allocated to cash transfer programming in 2016, a 40% increase on 2015.

The full report and executive summary are available here: <https://reliefweb.int/report/world/global-humanitarian-assistance-report-2018>

## New country-level Nutridash data available on updated State of Acute Malnutrition website

The State of Acute Malnutrition website ([www.acutemalnutrition.org](http://www.acutemalnutrition.org)) aims to provide an overview of all available information related to severe and moderate acute malnutrition in both English and French, at a global and country-specific level.

We are delighted to announce that the new Nutridash data for 2016 is now available. Thanks to your feedback, the updated State of Acute Malnutrition site is also easier to use on both desktop and mobile, and includes over 1,800 resources, upcoming events and data from Nutridash, Joint Estimates and sub-national coverage monitoring sources. Explore what's new and let us know your thoughts.

Do you have resources, events, or ongoing research that should be included? We would love to hear from you. Contact us on [info@acutemalnutrition.org](mailto:info@acutemalnutrition.org)

To stay up to date on all the latest in acute malnutrition, sign-up to the bi-monthly newsletter for a digest of all the latest publications, events and news. Don't forget to also follow the new State of Acute Malnutrition Twitter account at @AcuteMalnut

*The State of Acute Malnutrition is supported by the No Wasted Lives Coalition, an interagency effort between Action Against Hunger, the Children's Investment Fund Foundation, the European Commission Directorate-General for Humanitarian Aid and Civil Protection (ECHO), the Innocent Foundation, the International Rescue Committee (IRC), the UK Department for International Development (DFID), UNICEF, and World Food Programme (WFP).*

# Making connections: Joint meeting of WaSt Technical Interest Group and MAMI Special Interest Group



**E**NN coordinates two international technical groups, the Management of at-risk Mothers and Infants under six months Special Interest Group (MAMI SIG) and the Wasting and Stunting Technical Interest Group (WaSt TIG), to help identify and address critical questions for nutrition policy, guidance, research and related programming. Member expertise includes nutrition, child growth, medicine, epidemiology, nutrition policy and programming. Each group has conducted several research and programme-oriented activities and periodically meets to discuss new findings and set priorities.

The MAMI SIG was set up to help address critical gaps in policy, research and programming in managing malnourished infants under six months of age; the scope has broadened to at-risk mothers and infants under six months of age. Members are programmers, researchers and policy-makers directly engaged in this area. The group supports evidence development (through informed research agendas, research and reviews), helps fill gaps in policy and guidance, and provides a forum for peer support to support programming.

The WaSt TIG was set up to explore the disconnect between wasting and stunting. Members are experienced researchers and experts in rele-

vant fields. The group aims to bring together existing knowledge and support evidence development (identifying and prioritising gaps and conducting research) to better understand the linkages between wasting and stunting and to consider these in relation to nutrition policies, programmes and future research.

On 16 January 2018, ENN opportunistically convened a shared MAMI SIG/WAST TIG meeting in Oxford (UK), funded by Irish Aid. Group members were joined by representatives from funders, agencies and researchers working in international nutrition. Sixty-six individuals participated. The aims of the meeting were to share headlines from the work undertaken by both groups; collectively examine programmes, policy and research implications; and nurture synergies.

The meeting began with a history of both groups and a brief overview of key work and latest research findings by group members (Box 1 and 2). An important common finding from several analyses/reviews by both groups was the value of both weight-for-age z-score (WAZ) and mid-upper arm circumference (MUAC) measurement in identifying high-risk infants < 6 months and children. Afternoon plenary discussion and working groups identified the need for a new policy narrative that reframes nutritional vulner-

ability, spanning types of malnutrition and age groups and encompassing both treatment and prevention.

Participants saw great potential to strengthen the synergies between WaSt and MAMI; several next steps were identified for further/shared analyses (e.g. implications for treatment, risk factors and seasonality using Gambia cohort data), and areas for attention (e.g. longer-term functional outcomes for MAMI interventions). Participants emphasised that country-level priorities must inform global initiatives and research priorities. Stronger research dissemination and related communication to catalyse uptake that builds on and connects existing platforms is needed and requires investment from bilateral donors and national governments.

A full report of the meeting is available at: [www.enonline.net/attachments/2820/WaSt-MAMI-2018\\_meeting-Report\\_FINAL.pdf](http://www.enonline.net/attachments/2820/WaSt-MAMI-2018_meeting-Report_FINAL.pdf)

## References

McDonald CM, Olofin I, Flaxman S, Fawzi WW, Spiegelman D, Caulfield LE, et al. The effect of multiple anthropometric deficits on child mortality: meta-analysis of individual data in 10 prospective studies from developing countries. *Am J Clin Nutr.* 2013;97(4):896-901. doi: 10.3945/ajcn.112.047639. PubMed PMID: 23426036.

## Box 1 The WaSt story so far

Tanya Khara (ENN) shared the evolution of the WaSt Group, which stemmed from a review of financing arrangements around Community-Based Management of Acute Malnutrition (CMAM) by ENN and has since developed through several phases of work. Phase 1 (2014 to 2016) centred on a review of the evidence of the links between wasting and stunting and a WaSt research prioritisation that subsequently informed phase 2 (2016 to 2017). Phase 2 included Global Nutrition Report panel analysis (2016), several published papers, and a briefing note. An 84-country meta-analysis of prevalence and burden of children aged 6 to 59 months concurrently wasted and stunted found concurrence is prevalent, especially in boys, and concluded that these children are at particularly high risk of death; concurrence should be reported routinely and there is a need to investigate whether these children are being reached. Influence of this work was reflected in the WHO/UNICEF 2016 Joint Estimates report recognising the issue for the first time and noting that a global estimate for the level of concurrence is not known.

A working group of the WaSt TIG was subsequently formed to examine two core questions: what is the risk associated with being concurrently wasted and stunted and how best to detect these children. Two datasets were examined, one consisting of 2,426 (SMART) surveys of almost 1.8 million children from 51 countries and a second from Niakhar, Senegal (McDonald et al). André Briend (University of Tampere) shared key findings from these analyses. This showed that all children who are wasted and stunted are also underweight; 'multiple anthropometric deficit' (wasting+stunting+ underweight) is not an independent category and this term should be abandoned; when a child experiences both wasting and stunting concurrently there is a strong multiplicative effect on mortality risk; both weight-for-age z-score (WAZ) and mid-upper arm circumference (MUAC) detect WaSt; MUAC and WAZ are both independently associated with risk of death (but not WHZ, HAZ or WaSt); and WAZ <-2.8 detects a group of high-risk children not detected by MUAC. These results suggest that WAZ could be considered as an additional criterion for identifying high-risk children not identified by MUAC for admission into CMAM programmes. Most immediately, testing of these

findings on other datasets and further modelling of caseload and programmatic implications are needed.

Pending research questions include: what is the optimal WAZ cut-off avoiding overloading programmes but detecting high-risk children missed by MUAC<115 mm; how to adjust WAZ in programmes using a higher MUAC cut-off; and whether the same findings are repeated when other mortality cohorts are analysed.

Also under the auspices of the WaSt TIG, Sophie Moore (Kings College, London) shared the results of a retrospective cohort analysis of longitudinal data in Gambian children from 1976-2016. This showed that wasting and stunting are closely linked (being wasted increases the likelihood of being stunted); increased susceptibility to wasting continues in a child even after they have recovered from a prior episode (indicating profound metabolic disturbances and/or environmental factors at play); the season in which a child is born strongly predicts their subsequent linear growth and weight gain; and boys are more wasted, stunted and concurrently wasted and stunted than girls.

## Box 2 The MAMI story so far

Marie McGrath (ENN) and Marko Kerac (London School of Hygiene and Tropical Medicine (LSHTM)) shared that infants <6m old are now on the international policy agenda, a consequence of MAMI SIG influence. However, country-level policy and programmes are lacking, fuelled by weak evidence. Key issues that still need to be addressed include: how to achieve optimal growth among nutritionally vulnerable infants; how to deal with complex underlying diagnosis through feasible programming; and what does the 'MAMI' package of care look like (breastfeeding support is necessary but not sufficient). A reframing of thinking should consider prevention and treatment as one (infant and young child feeding (IYCF) = primary prevention; MAMI = secondary prevention; inpatient care = tertiary prevention); building bridges between MAMI and IYCF approaches; and embedding interventions in wider health programmes, such as integrated management of neonatal and child illness (MNCI). To achieve this, we urgently need strong evidence in the form of phase 3 RCTs and a robust, coordinated network of learning and exchange. The potential around MAMI is huge, but the needs are outstripping current group capacity. Scale up to a Global MAMI Network is needed to galvanise and support collective, collaborative, harmonised efforts on research and policy informed by, and to inform, practice.

An overview of recent key MAMI research and reviews was presented by Martha Mwangome and Jay Berkley (KEMRI-Wellcome, Kenya). How to define SAM in infants < 6m, the top question identified in a 2015 CHNRI MAMI research prioritisation exercise, has been a key focal area for the group. An ENN/LSHTM/ CHAIN review in 2017 identified MUAC and WAZ as the best anthropometric indices to identify at-risk infants <6m. Analysis of data from Keneba, Gambia, found WLZ was a poor predictor of mortality in this age group, while MUAC performed better. Another community cohort study of 2,882 infants admitted in Kilifi hospital, Kenya, with remote follow-up at three month visits of 1,455 discharged infants, showed that WAZ performed slightly better than MUAC at predicting inpatient mortality.

Cohort data (birth to one year of age, anthropometry and mortality data) from Burkina Faso is currently under analysis by the original researcher/ ENN/LSHTM/KEMRI-Wellcome to investigate mortality outcomes in infants up to six months of age. This dataset includes anthropometry and mortality data and distinguishes low birth weight (LBW) infants, among whom mortality is significantly higher. Provisional analysis indicates that both MUAC and WAZ screening at vaccination time (two months of age) could pick up a particularly at-risk group.

An ongoing study by KEMRI/Wellcome is exploring the role of breastfeeding in support and recovery of malnourished infants < 6m (Improving Breastfeeding support to treat Acute Malnutrition amongst Infants under 6 months (IBAMI)). It aims to apply WHO treatment guidelines rigorously and evaluate impact on breastfeeding, growth, morbidity and mortality after discharge. Analysis of data to date found that infants discharged on the WHO breastfeeding discharge criteria had subsequent higher average MUAC, WLZ and WAZ than those who did not meet the criteria (though not statistically significant). A small study of the supplemental suckling technique in Malawi found perinatal depression was notable among mothers experiencing breastfeeding, which influenced breastfeeding effectiveness and early cessation.

Outstanding questions include: whether to use MUAC or LBW criteria to define risk at birth; the feasibility of introducing screening at every infant contact and how to link to growth monitoring; what package of support is needed for infants after discharge from severe acute malnutrition (SAM) treatment; how to manage infants without possibility to breastfeed; and gaps in guidance regarding non-feeding interventions (e.g. antibiotics, micronutrient supplementation).

## Paving the way from research to action: cash and nutrition

By **Stephanie Stern**

Stephanie Stern leads Action Against Hunger Knowledge LAB, which explores innovative ways to facilitate knowledge uptake. She works to ensure that evidence produced is tailored to users' needs, 'ready to use' and easily accessible, and facilitates and supports the design of innovative tools and methodologies to reinforce the link between research and programmes and policies.



**T**ranslating scientific evidence into tangible, useable information to support evidence-based programming is an ongoing challenge for researchers and humanitarian practitioners. Since 2007, when Action Against Hunger began to engage in research, it has continuously explored efficient ways of linking research to action. In 2017, it launched the R4ACT – Research 4 Action methodology – with two main goals: (1) to simplify the understanding of research findings by producing a ready-to-use synthetic state of evidence on a chosen topic in a limited time frame; and (2) to support key stakeholders in the process of using this evidence in policy and programming. Scientific, programmatic and uptake perspectives are systematically taken into account at all the key stages of the methodology to ensure that scientific evidence is robust, practical and accessible.

The first pilot was developed in 2017, in partnership with the World Food Programme (WFP), focusing on the impacts of cash on nutrition. The

'ready-to-use state of evidence' on cash and nutrition was produced in collaboration with a steering committee composed of technical, research and uptake experts on cash and nutrition. This report summarised available evidence on the impact of cash on anthropometric indicators and the impact of design and implementation of cash programmes on nutrition outcomes. Findings were presented in tables rather than in a long narrative to facilitate easy reading.

The second stage of the methodology focused on engaging with evidence. A group was set up of 12 key stakeholders engaged in cash and/or nutrition programming and policy formation. Stakeholders were selected with care to ensure diversity of points of view and stimulate cross-sector and cross-organisational synergies. Representatives were included from Action Against Hunger, WFP, the Cash Learning Partnership, CashCap, ENN, United Nations Food and Agricultural Organization, Ministry of Health Nigeria, International Committee of the Red Cross, John Hopkins University, Save the Children,

United Nations High Commission for Refugees and the United States Agency for International Development. The group discussed key findings of the state of evidence and each member produced three related recommendations. During a one-day workshop these recommendations were pulled together, discussed and prioritised. The resulting shortlist of key recommendations was then translated into practical actions.

The full report and executive summary describe the methodology and key findings of this first R4ACT pilot. It is available at: [www.actioncontrelafaim.org/publication/highlights-from-the-research-4-action-workshop-on-cash-and-nutrition/](http://www.actioncontrelafaim.org/publication/highlights-from-the-research-4-action-workshop-on-cash-and-nutrition/)

The next R4ACT will focus on the impacts of water, sanitation and hygiene (WASH) on nutrition outcomes, with a planned workshop in December 2018.

For more information, contact Stephanie Stern, Action Against Hunger Knowledge Lab lead manager [sstern@actioncontrelafaim.org](mailto:sstern@actioncontrelafaim.org)



# Food assistance for nutrition: Evidence Summit

By Lindsey Green

Maria Kasparian (Edesia) poses a question during audience Q&A, Washington D.C., 2018



Adam Lowe Creative

Ongoing food crises around the world underscore the need for effective food assistance (defined as in-kind food aid and/or cash and voucher programming). As the environments in which food assistance is delivered become more complex and challenging, the demand for sound evidence on which to base policy and operational decisions continues to grow. Financial and human resources are limited; it is therefore critically important that actions aimed at cost-effective impacts are informed by rigorous evidence.

An 'Evidence Summit' was convened to facilitate dialogue and the sharing of evidence on food assistance of nutrition programming under the auspices of the Food Aid Quality Review (FAQR) project, funded by the United States Agency for International Development (USAID) Office of Food for Peace (FFP). The event took place in Washington DC on 27 and 28 June 2018. Over 250 researchers, policy-makers and representatives from donors, industry and implementing partners gathered to take stock of and critique existing studies and examine critical evidence gaps. A mix of presentations, panel discussions, 'lightning talks', demonstrations, discussions and poster/table displays covered the following areas:

- Current evidence on food assistance programming with maternal and child nutrition or micronutrient deficiencies as explicit outcomes of interest;
- Future needs for assistance in terms of the development of nutritionally-enhanced products, programming and optimising resource allocations;
- Cost-effectiveness research;
- Innovations in packaging, ingredients, formulations and processing of food aid products;
- Research methods and metrics to determine nutrition impacts, cost-effective operations, and additional ancillary goals;
- Food aid supply chain optimisation; and
- Food aid safety and quality.

Action items emerged during the meeting, resulting in a set of broadly agreed priorities as discussed below.

## As much research attention is needed on the cost-effectiveness of programming modalities as on the efficacy of products

Presenters Patrick Webb (Tufts University), André Briend (University of Tampere and University of Copenhagen) and Nancy Aburto (World Food Programme (WFP)) noted that great strides have been made in the past decade on food assistance research. Much of that work was focused on opti-

mising the composition of food products to meet defined nutrient needs of malnourished children. Multiple innovations in ingredients, formulations and processing were highlighted during the summit to spur a conversation on the continued improvement of product quality. *Some important questions regarding composition remain – including both the nutrient-specific requirements for malnourished children and the overall quality of products to ensure nutrient absorption and utilisation.*

The presenters also recognised that the scope and type of food assistance evidence generated has shifted recently, moving from food product comparisons towards more comprehensive evaluations of programme implementation. *That said, it was recognised that there is still an urgent need for improved empirical evidence on effective programme design and implementation, particularly where multi-sector actions are involved.*

## The ways we measure success must be refined and possibly expanded

Researchers representing WFP, Tufts University, International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B), and the Institut de Recherche en Sciences de la Santé (IRSS), discussed best practices for improving the quality of research. There was broad agreement that *programmes should always plan for rigorous evaluation and, where possible, incorporate sound studies of the facilitators and constraints to effective implementation and achievement of impact.* Financial, technical and logistical barriers to robust data collection always exist, but these can be surmounted through innovation, programmatic prioritisation and incorporation of technical expertise from other parts of the humanitarian and private sector.

There was animated conversation on expanding the metrics of impact used, particularly in measuring nutrition and health beyond traditional anthropometric z-scores. It was widely agreed that, while conventional nutrition outcomes are important, good measurement of intermediate steps are also key and a more comprehensive picture of 'success' is often needed; i.e., rather than relying on discharge or exit criteria from programming (such as exceeding a cut-off point in weight, weight-for-height, or mid-upper arm circumference (MUAC)), the prevention of relapse into malnutrition requires attention to the sustainability of 'recovery'. Developing metrics and field-friendly techniques to measure outcomes such as body composition, nutritional biomarkers, cognitive function and long-term productivity or contribution to society are key indicators that should be used and further developed.

It was also widely noted that investments in data analytics and assessment tools can be very helpful to operational stakeholders. Speakers from WFP, USAID, Northeastern University, CapGemini, World Vision International and the UPS Foundation highlighted significant gains that can be made by *investing in infrastructure to optimise decision-making along the supply chain and ensuring that the right food assistance products reach the right beneficiary at the right time.* The infrastructure for such systems requires upfront investment (which makes it difficult to establish), but there is interest and willingness to use and share data that would make food assistance more efficient and cost-effective.

## Multi-sector collaboration is critical across the food assistance ecosystem

Food assistance interventions encompass many actors across multiple sectors, making up an "elegant ecosystem" (Diane Holland, UNICEF). Multi-sector collaboration is necessary to maximise resources and address problems effectively and efficiently, but can be challenging due to differences (e.g., language, operating standards) across actors, requiring continued efforts to enhance collaboration. In addition to multiple actors, the ecosystem of food assistance includes many intervention points along the supply chain. *Innovations must be implemented using a 'systems-thinking perspective', considering feasibility across stakeholders, beneficiary perspectives and varied implementation contexts.*

The food assistance ecosystem can be nurtured through a well-stocked toolbox of food assistance modalities. Evidence on the effectiveness of cash and vouchers in achieving nutrition outcomes from the Cash Learning Partnership (CaLP) and Research on Food Assistance for Nutritional Impact (REFANI) was shared. There is also new evidence on the integration of complementary activities in the programming of food assistance. *Further evidence generation is needed in these areas, including how different modalities making up the food assistance ecosystem can work together and complement each other to support improved nutrition outcomes.*

## Constrained resources require nimble thought and action

Opening and closing keynote speakers Thomas Staal (USAID), Roger Thurow (The Chicago Council) and United States Representative Jim McGovern all noted that food assistance needs are not declining. Despite this, the speakers recognised that there is a lack of evidence on how best to use food assistance in emergencies, as well as how

best to transition food assistance from an emergency to development response. *These are key research priorities moving forward.*

With finite resources, food assistance efforts must be efficient, providing the best value for money; cost effectiveness must therefore always be considered in food aid programming. Results from recent field research and cost-effectiveness modelling from the iLNS, MINIMOD, FAQR, SPRING, CompAS and FANTA PM2A studies were reviewed. *Robust cost-effectiveness evidence should drive policy and programme decision-making.* Evidence on how food assistance can be used most efficiently and effectively to achieve nutrition outcomes has come a long way and much has been accomplished. Important research gaps persist and must be prioritised and sufficiently funded. Ultimately, as stated by Representative McGovern, hunger is

a political condition and addressing it requires political will and public interest.

### Collective learning must continue

There was a clear consensus that continued opportunities for sharing research updates and discussing the implications of emerging evidence on policy and programmes across stakeholder groups is vitally important. Rigorous evidence is clearly in high demand and there must be continued commitment to generating and sharing evidence to achieve common goals.

Materials from the evidence summit can be downloaded from: <https://foodaidquality.org/food-assistance-nutrition-evidence-summit>

For more information, please contact Lindsey Green at [Lindsey.Green@tufts.edu](mailto:Lindsey.Green@tufts.edu)

Evidence Summit speakers Washington D.C., 2018



Adam Lowe Creative

## Access to Nutrition Index

The Global Access to Nutrition Index (ATNI) 2018 aims to track the contribution of food and beverage (F&B) manufacturers to address global nutrition challenges by helping to improve diets worldwide. As incomes increase, consumers tend to eat and drink more packaged foods and beverages, driving growth in the F&B industry, particularly in emerging markets. The 22 F&B manufacturers assessed in the 2018 ATNI operate in over 200 countries and generate approximately US\$500 billion in sales. They therefore have a huge impact on the diets of consumers and the lives of their employees and have an important role to play in addressing the world's nutrition challenges.

In his blog Development Horizons ([www.developmenthorizons.com](http://www.developmenthorizons.com)) Lawrence Haddad summarises the findings of the 2018 ATNI. The “good news” is that most companies are “upping their game” in terms of their ATNI scores, possibly because of the index itself, with Nestlé leading the way as the highest-scoring company with 6.8 out of 10, up from 5.9 in 2016. The average score across all companies, however, is low at 3.3 and some companies' scores declined. Of the companies that defined targets to reformulate their products (n=16), all only did so for some of their products for some nutritional components, with little clarity on baselines and timelines.

Improvements are also needed in terms of targets relating to positive components of a healthy

diet (such as fruits and vegetables); responsible marketing to children and adolescents in all media; offering facilities to express and store breast milk and paid parental leave; commitment to label all nutrients globally; commitment to lobby in support of measures to prevent and address obesity; and to have global policies to make nutritious food more available and accessible to all. The report recommends that companies commit to reformulate all products (reducing salt, sugar and fat where needed and increase nutrients and fibre-rich ingredients); have a programme to support breastfeeding parents; market responsibly to all children 0-18 years of age in all media, with no exceptions; and agree not to lobby against the introduction of diet-related public health measures for which there is a scientific consensus. Lawrence states: “Food companies must be celebrated when they get it right and show progress and be called out when they do not. This report does this in a clear, balanced and therefore powerful way”.

## HIV and infant feeding in emergencies operational guidance

In 2016 the World Health Organization (WHO) and UNICEF published the guideline *Updates on HIV and infant feeding*<sup>1</sup>, where the relevance of these recommendations in emergencies was recognised. The purpose of a recently launched guidance document is to provide operational guidance on HIV and infant feeding in emergencies. It is intended to be used to complement emergency and sectoral guidelines on health, nutrition and HIV, including specifically infant feeding, prevention of mother-to-mother transmission of HIV and paediatric antiretroviral treatment. The envisaged target audience consists of decision-makers, policy-makers, national and sub-national government managers and planners,

managers for refugee camps and similar settlements for displaced persons, and managers and planners in United Nations (UN) agencies, non-governmental organisations (NGOs) and other groups responding to humanitarian situations.

This operational guidance is based on a consultation convened by WHO, UNICEF and ENN in Geneva in September 2016, which brought together a cross-section of senior participants from UN agencies, government, NGOs, academia and other agencies working in nutrition and HIV in emergencies. The document sets out basic principles related to HIV and infant feeding in emergency settings and the actions that government and other stakeholders can take to prepare for emergencies.

Specific actions are set out according to three scenarios: (i) national policy is breastfeeding plus antiretroviral drugs; (ii) national policy is replacement feeding; and (iii) HIV and infant feeding policy is unclear or not up to date. Countries are encouraged to hold key stakeholder discussions to inform decision-making on the use and introduction of the guidance into national programmes before an actual emergency situation.

The guidance is available from [www.who.int/nutrition/publications/hivaids/hiv-if-emergencies-guidance/en/](http://www.who.int/nutrition/publications/hivaids/hiv-if-emergencies-guidance/en/)

<sup>1</sup> [http://www.who.int/maternal\\_child\\_adolescent/documents/hiv-infant-feeding-2016/en/](http://www.who.int/maternal_child_adolescent/documents/hiv-infant-feeding-2016/en/)



# 10th edition of Nutrition Exchange



*Nutrition Exchange*, produced by ENN, has reached a milestone with its tenth edition! Issue 10, released in July 2018, features original articles by frontline practitioners working at country level in Bangladesh, India & Pakistan, as well as Somalia, Burundi and Myanmar. Articles from the Middle East & Latin America offer a regional perspective on how to improve nutrition.

*Nutrition Exchange* is available in English, French, Arabic and Spanish. Articles are complemented by podcasts from the editors and author interview shared on the ENNs Media Hub <https://www.enonline.net/mediahub>

Through active support to authors in the writing process, NEX provides an opportunity

for those working on the ground to share their stories and lessons learnt with a wider audience. The Nutrition Exchange editorial team are keen to work with more national and sub-national actors – the primary target group of this publication. Please share this resource widely with your partners at national and sub-national level and encourage them to contact the team with ideas.

Contact Carmel Dolan, Nutrition Exchange Co-editor at [carmel@enonline.net](mailto:carmel@enonline.net) and Judith Hodge, Nutrition Exchange Co-editor at [Judith.Hodge@enonline.net](mailto:Judith.Hodge@enonline.net)

Access Nutrition Exchange online at [www.enonline.net/nex](http://www.enonline.net/nex)



## en-net update: June to August 2018 inclusive

Over the past three months 42 questions have been posted on en-net, generating 78 responses. The forum areas for Assessment and Prevention and management of severe acute malnutrition generated most discussions, closely followed by the newly launched Adolescent nutrition area. Thirty-six vacancy announcements have been posted, which have accumulated 8,344 views on the website.

Discussions in the new Adolescent nutrition area have revolved around how to reach adolescents, particularly those who are out of school; and how to conduct nutrition education with this group.

It was reported that much of the available literature profiles programming conducted in East and South Asia. For example, Thailand has a health education programme for out-of-school adolescents that utilises community theatre to convey messages about sexual and reproductive health and rights. In Malaysia, the Ministry of Health partnered with UNICEF and the Programme for Staying Healthy without AIDS for Youth (PROSTAR) to provide life skills building information, including nutrition information, through peer education.

A systematic review ([http://allinschool.org/wp-content/uploads/2015/04/LiteratureReview\\_InterventionsToReach\\_OOSC\\_UNICEF-ROSA.pdf](http://allinschool.org/wp-content/uploads/2015/04/LiteratureReview_InterventionsToReach_OOSC_UNICEF-ROSA.pdf)) looking at effective interventions aimed at reaching out-of-school children in South Asia outlines the impact of pro-poor economic incentives, such as cash transfers, as well as non-formal education solutions, such as community-led programmes and vocational and skills training, for educating these youth. The paper concludes that, in this region, approaches to reach out-of-school children need to be tailored to reflect the situation analysis of communities, households, development partners, and governments, including the education sector. Success of incentive programmes, like cash transfers or food-for-education programmes, rely on effective targeting of families and children who are in need; while communities that are located in remote areas require additional support. In Myanmar, the development and success of Community Learning Centres for providing basic literacy and post-literacy activities could be a model for other isolated communities.

While the mention of out-of-school adolescents has begun to show up more frequently in strategic plans, specific nutrition programmes to reach

this population are less well established and evaluations of these programmes are even less prominent. In 2016, International Medical Corps described the inclusion of adolescent girls in community Care Groups in northern Nigeria, <https://www.enonline.net/fex/52/adolescecare-group>, which demonstrated how women's groups or peer support group models might be applied to reaching out-of-school adolescents. WFP Niger has recently scaled-up its adolescent nutrition programming and adapted its targeting strategy to ensure that all girls between 10 and 19 years of age in target households receive nutrition support, including daily iron and folic acid supplements. An article on this effort is included in this edition of Field Exchange.

Effective adolescent health interventions, including micronutrient supplementation and nutrition interventions for pregnant adolescents, are summarised along with priorities for further research in a 2016 paper in the *Journal of Adolescent Health* (Salam RA, Das JK, Lassi ZS, Bhutta ZA. Adolescent Health Interventions: Conclusions, Evidence Gaps, and Research Priorities. *J Adolesc Health*. 2016 Oct;59(4S):S88-S92).

WFP and Anthrologica have recently launched a report on adolescent health and nutrition based on research in Kenya, Uganda, Guatemala, and Cambodia, funded by Unilever. The synthesis report and country summaries are available here: <http://bit.ly/2GHNRcz>

To read more or join this discussion, go to <https://www.en-net.org/forum/29.aspx>  
To join any discussion on en-net, share your experience or post a question, visit [www.en-net.org.uk](http://www.en-net.org.uk) or [www.fr.en-net.org](http://www.fr.en-net.org)  
For any feedback on the site, please write to [post@en-net.org](mailto:post@en-net.org)

### Contributions

Mica Jenkins, Emily Keats, Natasha Lelijveld, Jo Lofthouse, Emily Mates, Ruth.



WFP/Nathan Sarker

# Special Section on MAMI: Management of at risk mothers and infants under six months



Field research officers measure the MUAC of an infant under six months in Barisal, Bangladesh, 2016

Save the Children

This issue of *Field Exchange* features six articles on managing nutritionally vulnerable infants under six months of age. This MAMI<sup>1</sup> section provides a snapshot of developments involving research, evaluation, programme experience and guidance development. Together they tell a story of progress, challenges and direction of travel that we reflect on here.

In 2015 Emergency Nutrition Network (ENN), London School of Hygiene and Tropical Medicine (LSHTM), Save the Children and a group of agencies and researchers developed the C-MAMI<sup>2</sup> Tool; a much-needed framework and approach to help guide programmers on how to manage malnourished infants under six months of age. Agencies have been utilising the Tool, notably Save the Children in Bangladesh and GOAL in Ethiopia. The C-MAMI Tool has now been updated to produce Version 2, shared in this issue, greatly informed by these and other programming experiences, most notably an evaluation of the Bangladesh and Ethiopia programmes also summarised in this issue. Key developments in the latest version include strengthened content on managing at-risk mothers as part of an infant-mother pair; assessment of nutritionally vulnerable infants under six months old beyond acute malnutrition parameters; and greater emphasis on health considerations. These reflect an understanding that assessment and management of vulnerability must include adequacy of infant growth, clinical care and the wellbeing of mothers.

Significant gaps of knowledge remain around the caseload of at-risk infants in different contexts and how to quantify caseload accurately. Research by Save the Children in Barisal district, Bangladesh, also summarised in this edition, examined this, investigating prevalence, risk factors and outcomes of infants with severe acute malnutrition (SAM) in a prospective cohort study. Unsurprisingly, the researchers found that existing treatment services that rely on inpatient care were poorly accessed – only 17% of severely malnourished infants reported for care. While at first glance it looks like a high proportion of infants had ‘recovered’ by six months of age, it emerged that nearly one quarter were still severely malnourished, 3.9% had died and, compared to the cohort of non-SAM infants, the SAM group was significantly more stunted and underweight at six months. These findings highlight the limitations of only considering SAM as a measure of risk (and recovery) and support the need for early identification and accessible interventions for nutritionally vulnerable infants. Informed by this study, Save the Children is now

trialling the C-MAMI Tool in this setting, with results due late 2018.

Save the Children's research in a stable context in Bangladesh proved a valuable springboard for its response to the Rohingya crisis in 2017/18. Infants under six months old were identified as a concern on the ground and the C-MAMI Tool was adapted and piloted in the response with UNICEF support; lessons learned are shared in a field article and have informed both Version 2 of the C-MAMI Tool and programme adaptation. A critical impediment to programme planning, monitoring and scale-up, highlighted in this experience, is a lack of field-friendly indicators to identify at-risk infants at community level, both in surveillance and for assessment by community level workers – there are no MUAC thresholds for this age group and weight-for-length (the current measure recommended for risk assessment) is impractical. Scale-up is being planned as part of the response, but without clear quantification of caseload, making planning and impact assessment problematic.

As programmers get deeper into MAMI programming, they encounter challenging cases. When it comes to vulnerability, we know that low birth weight (LBW), premature and disabled infants are at greater risk of malnutrition and death, but this is poorly quantified and typically becomes a hidden burden. Neonatal interventions focus on survival of these infants, but what happens afterwards to their growth and development? When a child is admitted to a CMAM programme at seven months of age, we have no idea of their birth history and growth trajectory up to that point. An article by Partners in Health (PIH) in Rwanda gives some insight into the burden and challenges of managing this subset of infants and again highlights the need for earlier intervention than is currently typical. District hospitals in Rwanda are increasingly including neonatal care units (NCUs), which means there is increasing survival of LBW/premature infants and infants born with disability. Cross-sectional follow-up data by PIH on infants discharged from NCUs found prevalence of malnutrition way above that of the general child population; children had significant feeding difficulties and were anaemic, stunted and wasted. In response, several paediatric development clinics (PDCs) were developed – a medical-home model to provide more comprehensive and specific medical/nutritional follow-up. Subsequent analysis of follow-up data on referred cases again showed they still weren't doing well, which has led to significant programme developments to address gaps around skilled capacity and assessment.

This intervention is unusual in a low-resource setting in terms of the specialist input and capacity needed to deliver this level of service. If it might be difficult to implement or sustain in many settings, why have we included it in this issue? Its relevance is that it provides a valuable insight into the burden, complexities of management and possible approaches to address management of a complex sub-set of infants that currently are invisible but that programmes will increasingly encounter once they start to manage infants under six months of age. We know that the burden of LBW/prematurity/disability in developing countries is high and underestimated. These infants are contributing to the CMAM programme burden, the stunted population, sick children and those who die. Shouldn't we be intervening early and figuring out how we do that? There is no magic bullet and it does need skilled support that takes investment in staff and time. One key challenge is to determine a quick and simple means of identifying the most at-risk of these infants, so that interventions are targeted to those where it will make the greatest difference – a focus area of the MAMI Special Interest Group<sup>3</sup>. In Rwanda they are ‘feeling’ their way through an approach that can work in their context; we can learn from them. Different approaches will be needed in other settings.

A critical question is whether MAMI interventions are cost-efficient and cost-effective. Save the Children calculated the cost-efficiency of a protocol based on the C-MAMI Tool in Bangladesh compared to the standard, inpatient-based protocol. The cost of C-MAMI to the healthcare provider was higher than the standard, but more cost-efficient per infant treated. If fully integrated into the national health system, the cost of C-MAMI would be halved. Costs to caregivers were lower for the C-MAMI Tool. More data are needed on the costs of such interventions that include the societal costs of not intervening – sick, chronically undernourished and developmentally delayed infants cost systems and lives.

Marie McGrath  
*Field Exchange Co-Editor and MAMI Special Interest Group Co-ordinator*

<sup>1</sup> Management of At risk Mothers and Infants under 6 months. Formerly ‘Management of Acute Malnutrition in Infants under 6 months’, this was revised in 2017 by the MAMI Special Interest Group to reflect the profile of infant-mother pairs being identified, their associated risks, and consequently the wider scope of interventions needed to cater for/support them; these include but are not limited to nutrition.

<sup>2</sup> Community Management of At Risk Mothers and Infants under six months.

<sup>3</sup> [www.enonline.net/ourwork/research/mami](http://www.enonline.net/ourwork/research/mami)

# The Paediatric Development Clinic: A model to improve outcomes for high-risk children aged under-five in Rural Rwanda



Mothers playing with their babies in the Rwinkwavu Hospital PDC

By Kathryn Beck, Catherine M Kirk, Jessica Bradford, Christine Mutaganzwa, Evrard Nahimana and Olivier Bigirimwami



Kathryn Beck is the Nutrition Specialist at Partners In Health/Inshuti Mu Buzima, Rwanda. She is a registered dietitian with over seven years' experience of clinical nutrition practice and three years working internationally on paediatric nutrition programming, with a specific focus on improving the quality of programmes to detect and manage acute

malnutrition in infants and children.



Catherine M Kirk is the Director of Maternal and Child Health at Partners In Health/Inshuti Mu Buzima, Rwanda. She has over six years' experience in child health programming and evaluation and is Principle Investigator of a Saving Lives at Birth grant evaluating scale-up of a neonatal quality improvement programme with the Ministry of Health and advisor on and development evaluations with UNICEF Rwanda.

three child nutrition



Christine Mutaganzwa is a general practitioner and was the Paediatric Development Clinic lead from 2015 to 2018. She has seven years' experience of paediatric clinical care provision and programme implementation and three years' research experience in chronic diseases and child health.



Jessica Bradford is the Pediatrician Specialist at Partners In Health/Inshuti Mu Buzima, Rwanda. She is a pediatrician and internist with over eight years' experience working in East Africa. In her current role she is a clinical advisor in district hospital neonatal and paediatric units, as well as the Paediatric Development Clinic.



Evrard Nahimana, the Deputy Chief Medical Officer in charge of primary healthcare at Partners In Health/Inshuti Mu Buzima, is a clinician and public health researcher with over ten years' experience. His research has focused on how to strengthen capacity for delivering high-quality neonatal services across the continuum of care in rural Rwanda.



Olivier Bigirimwami is a non-communicable disease trained nurse at Rwinkwavu District Hospital in eastern Rwanda. He has been working in the Paediatric Development Clinic (PDC) for the past four years and is a mentor in the Kayonza District catchment area to other PDC nurses.

The authors would like to thank the contribution of the entire Paediatric Development Clinic team, including clinicians, advisors, researchers and data analysts, who contributed to this work and the day-to-day operation of the PDCs. We would also like to thank the patients and caregivers for entrusting us and the entire PDC team with their healthcare and the Ministry of Health Rwanda and UNICEF for their support to the PDCs and MAITS, D-Tree International, and Boston Children's Hospital for their collaboration to improve quality of care.

## Location: Rwanda

**What we know:** In Rwanda 9.5% of newborns are born prematurely and 6% are born low birth weight (LBW). Identifying and managing growth failure in LBW infants is challenging.

**What this article adds:** Preterm and LBW survival is increasing in Rwanda, partly due to opening of neonatal care units (NCUs) in district hospitals. Review of progress of a cross-section of infants aged 1-3 years post-discharge found prevalent feeding difficulties, anaemia and stunting and wasting rates well above that of the general infant/child population. In response Paediatric Development Clinics (PDCs) were developed by Ministry of Health/UNICEF/Partners in Health (PIH) to provide more comprehensive and specific medical/nutritional follow-up. Subsequent review of a cohort of 316 enrolled infants less than six months old indicated ongoing poor nutritional status (25% severely underweight, 5% severely malnourished). Implementation challenges included difficulties calculating corrected age and gaps in capacity to assess and support feeding difficulties. Actions taken include specialist training for staff on managing infant feeding difficulties in low-resource settings, identification and training of expert mothers, strengthened breastfeeding support in the NCUs, adaptation of the C-MAMI tool to manage malnourished cases, and development of a mobile app to help anthropometric/growth assessment. Further experiences will be documented. Research is examining contributing factors to malnutrition in this age group.

## Background

Postnatal medical, nutritional and developmental needs of infants born preterm, low birth weight (LBW), with hypoxic ischemic encephalopathy (HIE) (a brain injury following asphyxia), central nervous system (CNS) infections and other disabilities, including trisomy 21, are different from those of normal weight, full-term infants without developmental disabilities and have a higher risk of respiratory, hematologic, infectious, sensory and neurologic complications and require regular monitoring and early intervention. Optimal nutrition and growth requires monitoring growth velocity over time, including weight, length and head circumference, and adequate interpretation of z-scores to assess for malnutrition. Identifying growth failure in LBW infants is particularly challenging as this group includes a mix of preterm infants, small for gestational age (SGA) infants, and infants who are both preterm and

SGA. Current World Health Organization (WHO) growth charts to assess nutritional status (weight-for-length) exclude infants <45 cm. Intergrowth 21 has recently published international growth standards based on appropriate gestational age (AGA) for preterm infants, yet detailed information on gestational age and birth weight is often lacking in low- and middle-income countries (LMICs).

Infants born preterm may also have difficulties breastfeeding due to potential for an immature suck pattern, difficulties coordinating breathing and vomiting during or after feeding, and have reduced milk intake. This requires strategies to regulate the infant, including providing Kangaroo Mother Care (KMC) for thermoregulation and bonding and strategies to improve suck and reduce vomiting. Infants born with syndromes such as trisomy 21 may have low muscle tone or exhibit “floppiness,” causing the infant to be less alert and have decreased tone and sensation in the mouth and throat, resulting in difficulty swallowing. Infants born with HIE may demonstrate high muscle tone, causing stiffness and resulting in difficulty in positioning for breastfeeding, and “tight” jaws, causing difficulty in latching.

To address these challenges, specialised feeding support by trained personnel is needed to ensure adequate breastfeeding and therefore appropriate growth. In addition, higher risk of developmental delay in these newborns requires early stimulation and developmental monitoring over time.

### Country context

In Rwanda 9.5% of newborns are born prematurely and 6% are born LBW (Every Preemie Scale, 2017). Preterm and LBW survival is increasing in Rwanda, in part due to the opening of neonatal care units (NCUs) in district hospitals. Postnatal follow-up of healthy newborns is performed at the community level by Agent de Santé Maternelle et Infantile de Santé (ASM), who are Community Health Workers (CHWs) in charge of maternal and newborn health. After facility discharge following delivery, ASMs conduct postnatal home visits that include identification of danger signs, with referral to health facilities if needed, breastfeeding education, encouragement of KMC for LBW infants, and weighing newborns. However, no national system is in place for targeted postnatal follow-up of high-risk newborns including preterm, LBW, or infants with other vulnerable medical conditions. In a study conducted in Kayanza district in eastern Rwanda, LBW and preterm infants discharged from the hospital NCU were followed up at one to three years post-discharge to determine their nutritional, medical and developmental status in the absence of routine follow-up (Kirk et al, 2017). Caregivers reported 47% of children had feeding difficulties and 40% reported signs of anaemia; 67% had an abnormal development screening on the Ages and Stages Questionnaire-3 (ASQ-3). Notably, malnutrition parameters were more than double or triple the 2014/2015 Demographic Health Survey (RDHS, 2014/15) national averages: 79% stunted, 9% wasted and 38% underweight, vs. 38%, 2%, and 9% nationally, respectively. Lack

of comprehensive and consistent follow-up can have detrimental impacts on the health and well-being of high-risk newborns, which has lasting implications beyond the neonatal and infant periods.

### Paediatric Development Clinics

In 2014 Partners In Health (PIH), in collaboration with the Rwanda Ministry of Health (MoH) and UNICEF, implemented Paediatric Developmental Clinics (PDCs) to provide integrated early-intervention clinical, nutritional, social and developmental services to infants born with perinatal complications in rural Rwanda. Currently there are eight PDCs across two districts in the eastern province of Rwanda. To our knowledge, this is the only clinic of its kind in sub-Saharan Africa. PDC provides integrated care to at-risk infants and children under-five years old in a medical-home model, using a comprehensive and continuous team-based approach. Nearly 90% of infants admitted to the PDCs are neonates discharged post-NCU admission for prematurity, birth weight <2000 grams, HIE, cleft lip/palate, or trisomy 21. Other reasons for admission include developmental delay, hydrocephalus and those <12 months old who had required hospitalisation for complicated severe acute malnutrition. PDCs are funded by the MoH with support from PIH. A costing study is underway to assess the cost of providing PDC care.

### PDC interventions

At each PDC visit caregivers participate in a group education session followed by individual consultation, where the nurse screens the patient for danger signs following Integrated Management of Childhood Illness (IMCI) guidelines (and refers to IMCI if needed), weighs the patient, measures the length/height and head circumference, and calculates corrected age up to two years in infants born premature, interval growth in children <2 years (targets include  $\geq 20$  grams/day <3 months and  $\geq 15$  grams/day 3-6 months) and z-scores using WHO growth charts. A feeding assessment is conducted to assess appropriateness of the diet at home and the child's appetite. Certain conditions require medical management; for example, providing iron to premature infants up to 12 months old or provision of anticonvulsants to infants with seizures. Referrals are made to specialists where needed, including physiotherapy, cardiology and optometry to address medical complications. Children are screened for developmental problems at specific ages (including 6, 12 and 18 months), using the ASQ-3. Counselling is provided to the caregiver by the nurse and/or social worker regarding medical conditions, growth assessment, nutrition and feeding, and/or developmental status. Social workers may conduct home visits to those most vulnerable patients.

Food supplementation is provided to mothers of infants with growth faltering and counselling to breastfeeding mothers where needed. Those with medical complications are referred to district hospitals.

### PDC staff training and mentorship

Nurses in PDCs are usually general nurses with a post-secondary diploma in nursing. Social workers typically also have a post-secondary diploma.

Both nurses and social workers have been trained in the PDC protocol annually since 2014, with new PDC staff trained as new clinics open.

PDC has adopted the Mentoring and Enhanced Supervision for Healthcare (MESH) model (Anatole et al, 2013), developed by PIH and MoH, and utilises one-on-one provider mentorship as a method for continuous quality improvement. PDC mentors are district hospital-based nurses in charge of hospital PDCs who have demonstrated exceptional provision of quality care. They are trained in mentorship methods and are facilitators during annual PDC trainings. Mentors utilise checklists to assess quality of care during mentorship visits, which inform targeted feedback to the mentee.

Additionally, the PDC receives mentorship support from the PDC Manager (who is a clinician), a pediatrician/internist doctor trained in the United States and nutritionists from PIH and district hospitals.

### Nutrition outcomes in the PDCs

Nutritional status of infants under six months old was assessed over the period January 2015 to December 2016. During this period, 316 infants under six months old completed follow-up (52% female) and had 2,117 individual PDC visits. They were enrolled with the following diagnoses: prematurity or LBW (70%), HIE (28%) and other conditions (9%). About half (43%) were born <37 weeks (32% with missing gestational age data), 53% had a low weight at birth (14% VLBW (very low birth weight)), and 32% were SGA (36% with missing data).

Prevalence of weight-for-age (WAZ) and weight-for-length (WHZ) were used to assess nutritional status at 3 and 6 months old. When a gestational age was available, corrected age was used. Prevalence data show that, at three months, 9% had moderate acute malnutrition (MAM: WHZ <-2) and 5% had severe acute malnutrition (SAM: WHZ <-3). Seventeen per cent were moderately underweight (WAZ <-2) and 25% were severely underweight (WAZ <-3). By six months, SAM increased slightly to 6% and MAM almost doubled (16%). By six months, WAZ <-2 increased to 22% and WAZ <-3 decreased to 23%. WAZ <-2 at six months is more than five times the national prevalence (4.3%), while WHZ <-2 at six months is three times the national prevalence (5.4%). The same infants were not used to assess growth trajectory over time in these data, which only show prevalence of malnutrition at three and six months of age.

### Nutrition-related challenges and solutions developed in PDCs

Although the PDC has provided a much-needed service in the absence of high-level postnatal follow-up for high-risk infants, some challenges remain.

#### Nutrition assessment

Identification of accurate gestational age at birth remains a challenge in many low and middle-income countries (LMICs). This prevents differentiating prematurity, SGA and LBW, which has implications for growth trajectory and achieving optimal growth targets.

For infants with a known gestational age, nurses calculate corrected age up to two years old, which is used to determine z-scores and (ideally) in counselling on timing for introduction of complementary feeding. Calculation of corrected age and interval growth, or growth velocity, is a challenge in the PDCs. Corrected age requires calculation of chronological age and subtracting weeks premature from the chronological age. For interval growth, nurses determine the number of days since the last PDC visit and divide this by the difference between the child's current weight and previous weight. Errors in calculations lead to discrepancies in both corrected age and interval growth. Initial data showed that corrected age was not calculated for around three quarters of infant visits and interval growth was missing for one quarter (Ngabireyimana et al, 2018).

Plotting WHO z-scores has also remained a challenge for nurses, particularly with those infants who fall on the lower end of the growth curve, where distinguishing between one growth centile and another is challenging.

For those infants whose gestational age is known, an mHealth application has been developed through a collaboration with Dtree International. This tool assists PDC nurses in the calculation of corrected age and chronological age. Additionally, it calculates interval growth and z-scores for all children, regardless of availability of gestational age. The decision-support tool links nutritional calculations to further nutritional assessments and/or counselling through messages to the provider. Staff in one of the PDC catchment areas have been trained and effectiveness of the tool will be assessed before scaling up to the remaining PDCs. The hope is that this tool will aid PDC nurses with earlier recognition of growth faltering/failure and appropriate guidance on how to manage it.

### Infant feeding assessment and breastfeeding support

Adequate and safe exclusive breastfeeding starts in neonatology and continues in the home and outpatient setting. In the two district hospitals from where PDC patients are referred, at baseline (October–December 2017), only 6% of infants born VLBW, 60% of infants born LBW, 72% of infants with HIE, and 65% of neonates overall were exclusively breastfed from the breast at time of discharge (compared to a national breastfeeding prevalence of 87%). Adequate growth in these infants during admission was also a challenge: average interval growth during admission was 0.6 grams/day for VLBW infants, 5.0 grams/day for LBW infants, and 15.4 grams/day for infants with HIE, compared to the recommended 15 grams/day.

Knowledge and practice in addressing feeding challenges in this population is a challenge in PDCs and the challenges often increase after hospital discharge, when there are fewer opportunities to receive counselling and support at home. Accurately and comprehensively assessing feeding difficulties requires expertise (often lacking at community level), as does the provision of counselling to mothers in this population, which also requires time to 'trial and error' positioning and

other interventions. Often infant formula was provided in PDCs to mothers experiencing difficulties with breastfeeding; however, provision of artificial milk, particularly in rural, LMIC settings, may pose risks to the infant that outweigh any benefit, including use of unclean water, expense of infant formula and the burden of preparing artificial milk feedings, in addition to missing the well established benefits of exclusive breastfeeding.

To address these issues a partnership was formed with MAITS, a UK-based non-governmental organisation (NGO) that aims to improve the lives of individuals living with disabilities through access to family support, quality healthcare and education. MAITS teams of healthcare and education experts travel to low-resource settings to share their skills with other health providers. In February 2018 two speech and language therapists, who are international MAITS trainers, travelled to Rwanda to train 24 nutritionists, neonatal nurses and midwives working in maternity and post-partum wards and PDC nurses and social workers on their self-developed two-day training, Working with Infants with Feeding Difficulties in Low Resource Settings. The purpose of the training is to improve the knowledge and skills of healthcare providers working with infants with feeding difficulties, and their caregivers, to support breastfeeding and nutrition. Through a training-of-trainers model, three local 'Master Trainers' were trained to be able to continue delivery of this training in Rwanda and continue to be supported by MAITS trainers through ongoing phone calls and case studies. To date, the three Master Trainers have gone on to train 36 additional healthcare providers from seven district hospitals in Rwanda.

In addition, a new position has been created in both district hospital NCUs in the PDC catchment areas called, 'Umujejanama mu konsa' or 'Expert Mothers'. These are women who had a baby discharged from the hospital NCU who is now enrolled in PDC and serve as peer counsellors to other mothers, helping them learn how to breastfeed and promoting early and exclusive breastfeeding through counselling, education and emotional support. The Expert Mothers have been trained by the Master Trainers in a three-day version of the MAITS training and components of the WHO Breastfeeding Counselling training course. They continue to receive on-going mentorship from the Master Trainers.

Other strategies to promote early and exclusive breastfeeding include availability of refrigerators in the hospital NCUs for breastmilk storage, KMC chairs and breastfeeding u-shaped pillows to support comfortable breastfeeding positions, privacy screens for mothers who do not want to breastfeed or express breastmilk in an open ward, and education materials, including tablets and projectors to play Global Health Media Videos for mothers. The impact of these measures will be assessed through ongoing and continuous monitoring and evaluation.

Addressing both the issue of accurate nutritional assessment and feeding assessment, in Au-

gust 2017 the PDC protocol was revised to include more clear and comprehensive guidance on assessing and managing malnutrition in infants <6m old and their caregivers through integration of the Community Management of Malnutrition in Infants and At-Risk Mothers (C-MAMI) tool into the PDC protocol. This shifted treatment of uncomplicated acute malnutrition in infants <6m old to PDC, instead of referring these infants to the district hospital. A complementary algorithm was developed to guide nurses and social workers in growth failure and malnutrition assessment and management. The C-MAMI counselling tool was translated into the local language, Kinyarwanda, and staff were trained in September 2017. Ongoing facility-based mentorship has continued since that time by PDC mentors and nutritionists.

### Conclusion and way forward

This experience demonstrates that LBW/premature/disabled infants are at high-risk of malnutrition, and that active follow-up and intervention is necessary to address this. In this rural Rwandan context, PDCs are a medical-home model that are being implemented in the Ministry of Health system with additional external support (PIH and supplementary funding from donors). While nutrition outcomes from initial implementation of this model were not satisfactory, we have identified critical areas for improvement among this high-risk population that are being acted on through several strategies. Ongoing assessment of PDC interventions will continue in all clinic sites, with continuous quality improvement to enhance the nutritional, medical, and developmental outcomes of infants admitted to PDCs. We will continue to develop and share our model for outpatient follow-up in a rural setting of infants born preterm, LBW, or with other conditions, and to raise awareness of the special needs of this population in developing policies and practices to meet their needs. There are ongoing research studies to assess the factors associated with malnutrition in PDC patients <6m, as well as those 6–59 months, cost-effectiveness, and overall impact of PDC on children's health, nutrition and development to further inform the way forward.

For more information, contact: Katie Beck at kbeck@pih.org

### References

- Anatole M, Magge H, Redditt V, et al. Nurse mentorship to improve the quality of health care delivery in rural Rwanda. *Nurs Outlook*. 2013;61(3):137–144.
- Every Premie Scale. Rwanda: Profile of Preterm and Low Birth Weight Prevention and Care. 2017.
- National Institute of Statistics of Rwanda. (2015). *Rwanda Demographic and Health Survey Final Report 2014–2015*. Republic of Rwanda: Kigali, Rwanda.
- Ngabireyimana E, Mutaganzwa C, Kirk CM, et al. A retrospective review of the Paediatric Development Clinic implementation: A model to improve medical, nutritional and developmental outcomes of at-risk under-five children in rural Rwanda. *Maternal Health, Neonatology and Perinatology*. 2017; 3(13).
- Kirk CM, Uwamungu JC, Wilson K, et al. Health, nutrition, and development of children born preterm and low birth weight in rural Rwanda: a cross-sectional study. *BMC Pediatrics*. 2017; 17:191.

# Piloting the C-MAMI approach in the Rohingya response in Bangladesh



A MAMI counsellor measures the MUAC of a mother whilst she holds her baby at a C-MAMI site, Cox's Bazar, Bangladesh, 2018

Daphnee Cook/Save the Children

By Anne Marie Kueter, Alice Burrell, Sarah Butler, Mostofa Sarwar and Habibur Rahaman



Anne Marie Kueter is a nutritionist with over five years' experience in humanitarian nutrition in various countries in Africa, Asia and the Middle East with GOAL, Action Against

Hunger and Save the Children UK.



Alice Burrell is a Nutrition Adviser with Save the Children's Humanitarian Surge Team. She has substantial experience leading on infant and young child feeding in

emergencies interventions in the European migrant response, South Sudan, Bangladesh and Syria.



Sarah Butler is the Director of Emergency Nutrition at Save the Children, USA. She has more than ten years' experience in nutrition across multiple contexts,

supporting quality programming and innovation for children.



Mostofa Sarwar is a medical doctor with five years' experience in maternal and child health and nutrition in development and emergency contexts with

leading non-governmental organisations. He is currently the Deputy Manager, Health, Nutrition and HIV/AIDS for Save the Children in Bangladesh.



Habibur Rahaman has a public health background, with over eight years' experience in emergency and development contexts in Bangladesh. He has

previously worked with Action Against Hunger and UNICEF and is currently the Technical Manager Nutrition for Save the Children for the Rohingya response in Cox's Bazar.

The C-MAMI programme in Cox's Bazar, Bangladesh, was made possible with the generous funding of DFID (through UNOPS) and UNICEF.

## Location: Bangladesh

**What we know:** Community-based management of uncomplicated severe acute malnutrition in infants under six months is recommended by WHO; the community-based management of at risk mothers and infants less than 6 months (C-MAMI) Tool was developed to help put this into practice.

**What this article adds:** A pilot programme was implemented by Save the Children and UNICEF in the Rohingya response to identify and manage nutritionally vulnerable infants <6m using an adapted C-MAMI Tool. Seven C-MAMI sites were established between November 2017 and July 2018, integrated/aligned with existing programmes. Infants <6 months and their caregivers were referred via multi-sector community mobilisers for screening and management or referral. By mid-June 2018, 1,964 infant-mother pairs were referred to C-MAMI sites, of whom 762 were enrolled in outpatient care and 78 complicated cases referred for inpatient treatment. Programme challenges included lack of baseline caseload data (anthropometry of infants <6m not included in surveys conducted); the recruitment of suitably qualified staff (MAMI counsellors); high caseload numbers; assessment difficulties (including of low birth weight infants and maternal mental health problems); harsh conditions; data collection difficulties linked to Commcare platform; and some limitations in adaptation of the C-MAMI Tool for this context (discharge criteria). Developments planned include management of simpler cases by existing infant and young child feeding (IYCF) programme to reduce MAMI caseload and transfer to KOBO platform for data collection. Experiences have informed the latest C-MAMI Tool (Version 2). Plans are to scale up MAMI across the Rohingya response.

## Background

### Acute malnutrition in infants under six months old

In 2017, wasting (both moderate and severe) continued to threaten the lives of an estimated 50.5 million (7.5% of) children under five years old globally. Of these, 16 million were severely wasted (UNICEF/WHO/World Bank Group, 2018). It is estimated that malnutrition was an underlying factor in almost half of the 5.6 million under-five child deaths in 2016 (UNICEF, WHO and World Bank, 2017). These global estimates are largely based on country-level data sets comprised of representative household surveys, within which disaggregated data for infants under six months (infants <6m) are not always available or usually presented. Infants <6m have traditionally been considered less vulnerable to malnutrition due to the protective factors of exclusive breastfeeding; however, only two in five infants <6m are exclusively breastfed globally (UNICEF, 2018) and infants in this age group are often

exposed to risky feeding practices (such as unsafe artificial feeding, pre-lacteal feeds and early introduction of complementary foods).

There is now evidence that acute malnutrition is a serious public health concern in the <6m age group. A 2011 secondary data analysis in 26 high-burden countries estimated that 23% of overall SAM cases were infants <6m (Kerac et al, 2011), while a recent secondary data analysis found that infants <6m were at greater risk of death during inpatient treatment than older age groups (Grijalva-Eternod, 2017). Commonly used survey methodologies, such as SMART, typically only collect anthropometric data for children 6-59 months old. One of the complications in getting data for the <6m age group is that there is no internationally agreed cut-off threshold for MUAC to identify at-risk infants. Weight-for-length z-score (WLZ) is the current recommended anthropometric criterion for severe acute malnutrition (SAM) in infants <6m. However, weight and length are more difficult to measure accurately in younger infants and WLZ is not available for lengths under 45cm;



therefore this age group is often overlooked in community screenings and nutrition surveys (Lopriore et al, 2007).

### Community based management of acute malnutrition in infants

Over the last decade, the management of acute malnutrition in children aged 6-59 months has greatly improved following the introduction of Community-based Management of Acute Malnutrition (CMAM). However, management of acute malnutrition in infants <6m has not kept pace. The 2013 World Health Organization (WHO) Updates on the Management of Severe Acute Malnutrition in Infants and Children recommends for the first time that infants <6m with uncomplicated malnutrition are managed as outpatients, while also acknowledging the low level of evidence to identify and manage cases.

Save the Children pioneered research on the management of acute malnutrition in infants <6m at the community level in Bangladesh from 2013-2016. In 2015 Save the Children collaborated closely with ENN and the London School of Hygiene and Tropical Medicine (LSHTM) in the development of an innovative C-MAMI (Community Management of At risk Mothers and Infants) Tool to help harmonise and catalyse case management (Box 1). The need to address infants <6m in the Rohingya response, coupled with Save the Children's experience with C-MAMI in Barisal District, Bangladesh, led to the piloting of the C-MAMI approach in this emergency from 2017 to 2018, the results of which are described in this article. These experiences were used to inform the development of the recently released version 2.0 of the C-MAMI Tool<sup>1</sup> (see article in this issue).

## C-MAMI in the Rohingya response in Bangladesh

### Nutrition situation in the Rohingya population in Bangladesh

According to the Inter Sector Coordination Group report from June 2018, 706,364 Rohingya people have crossed into Bangladesh since 25 August 2017, fleeing large-scale violence in Rakhine State, Myanmar. The Rohingya people have sought safety in Cox's Bazar (where the total Rohingya population is now 914,678) and are concentrated within Ukhiya and Teknaf, where most refugees live in makeshift shelters in congested camps and settlements. SMART surveys conducted between October and November 2017 measured the prevalence of acute malnutrition in children aged 6-59 months by WHZ and found a prevalence of SAM of 7.5 % (95% CI 4.9-11.2) in Kutupalong camp; 3.0% (95%

CI 2.2-4.2) in the Makeshift camps; and 1.3% (95% CI 0.5-2.9) in Nayapara camp. WHZ was not measured in infants <6m; however MUAC was assessed to help build the evidence base for this indicator in this age group. Average MUAC for infants <6m was 118 mm in Kutupalong, 119 mm in makeshift camps, and 118mm in Nayapara. IYCF indicators assessed during the SMART surveys were found to be poor, with only 56.1% of infants <6m being exclusively breastfed in makeshift camps. In Nayapara, exclusive breastfeeding rates for infants <6m were found to be slightly better at 72.2%. The results of the SMART surveys showed that the high levels of malnutrition and poor IYCF practices were further compounded by poor care practices and micronutrient deficiencies.

An estimated 8,129 infants <6m were among the Rohingya camp population, according to a UNHCR family count in late 2017. Despite the absence of survey data on infants <6m to estimate the actual caseload, the relatively high number of infants <6m in the population, coupled with poor IYCF practices and the lack of interventions addressing this particular group, led the Nutrition Sector in Cox's Bazar to identify the management of vulnerable infants <6m as a gap. A pilot of the C-MAMI approach was endorsed to address this. In November 2017 Save the Children, in partnership with UNICEF, began to implement C-MAMI to address the need for outpatient treatment of nutritionally vulnerable infants <6m, starting with a pilot phase to adapt the methodology to this particular emergency context.

## Intervention

The key objectives of the C-MAMI pilot were to test the suitability of the existing tools for use in the Rohingya response to get a better understanding of specific breastfeeding challenges in this context and to determine staffing needs to further inform the training package needed. Supervision visits and lessons-learned meetings were held at each of the C-MAMI sites.

During the original pilot phase (November 2017 to February 2018), four C-MAMI sites were established by Save the Children in Cox's Bazar. The implementation of the C-MAMI project continued beyond the pilot phase and an additional three C-MAMI sites were opened between March and May 2018, bringing the total of active C-MAMI sites to seven (as of July 2018). All C-MAMI sites are integrated within Save the Children's wider health and nutrition programme; all sites were set up within mother-baby areas (MBAs) and adjacent to outpatient therapeutic pro-

grammes (OTPs) (in all but one of the sites) and health posts. This integrated set-up facilitated the identification and referral of infants <6m and their mothers at facility level; for example, referral of infants and their mothers to the C-MAMI sites from postnatal care services.

The C-MAMI project in Cox's Bazar is managed by an international senior programme manager and two national programme managers, with support from an international technical adviser. Each C-MAMI site is staffed by two MAMI counsellors (all female) and each site has a MAMI supervisor (both male and female). MAMI counsellors are responsible for screening, anthropometry (weight-for-length (to identify acute malnutrition) and MUAC (for data purposes)), enrollment and registration of mother-infant pairs, and management of enrolled cases including one-to-one counselling. MAMI supervisors are responsible for daily supervision, quality monitoring and on-the-job training and support, as well as reporting of data. An initial training of trainers (ToT) was conducted by an experienced Save the Children staff member from the research project in Barisal. Staff trained during this ToT were then responsible for training new staff as new sites opened.

Identification and referral of nutritionally vulnerable infants <6m and their mothers at the community is supported by multi-sector community mobilisers. Due to the high workload of the community mobilisers and difficulty in identifying vulnerable infants <6m (lack of MUAC cut-off threshold to identify acute malnutrition in infants <6m and assessment of mother-infant pairs for nutritional vulnerability being time-consuming), it was decided that community mobilisers should refer all infants under <6m in the catchment areas of the C-MAMI sites for assessment at facility level. Infants <6m and their mothers were also referred from the health and nutrition posts, especially from the reproductive health units and MBAs. Maternal and child health and nutrition (MCHN) promotors supported the MAMI counsellors with home visits, follow-up, and community health and nutrition education.

Identified nutritionally vulnerable/at risk infants <6m and their mothers were enrolled in the C-MAMI programme. Low-risk infants and their mothers were referred to the IYCF services in the MBAs. In areas where blanket supplementary feeding programmes (BSFP) were available, caregivers of infants <6m were referred to enroll for a supplementary food ration. When infants in the C-MAMI programme turned six months of age they were referred to the appropriate nutrition services (CMAM) for further treatment if necessary.

## Results

From November 2017 until mid-June 2018, 1,964 infants <6m old across the seven sites in Save the Children's catchment area were referred for rapid assessment at the C-MAMI sites. A total of 847 infants <6m underwent the full mother-infant pair assessment, from which 762 mother-infant pairs were enrolled in the C-MAMI programme. See Tables 1, 2 and 3 below for further details.

## Box 1 C-MAMI Tool in Bangladesh

The C-MAMI Tool was developed to identify vulnerable infants <6m and their mothers at risk of malnutrition. Assessment and classification of vulnerability do not solely rely on anthropometry as seen in older children, but include feeding, clinical and maternal mental health status to reflect associated risks of mother-infant pair and wider scope of interventions needed to cater for/support them.

Save the Children's C-MAMI project uses a mobile based application called Commcare to collect and transfer data from the C-MAMI sites to a central, cloud-based database. This application is used for case screening, step-by-step case management and reporting for real-time data collection and monitoring.

The mobile-based system for the assessments automatically classifies the infant and mother according to four colour-coded categories, from severe problem (pink) to moderate and some problem (yellow 1 and yellow 2) to not urgent (green). Infants and mothers classified as pink are referred for inpatient care. Yellow cases are enrolled in the C-MAMI programme and green cases are discharged with general advice only.

<sup>1</sup> Available at [www.enonline.net/c-mami](http://www.enonline.net/c-mami)

**Table 1** Classification of mother-infant pairs who underwent full assessment

Classification	Male	Female	Total
Pink*	47	31	78
Yellow 1	382	377	759
Yellow 2	2	1	3
Green	3	4	7
Total	434	413	847

\* Mother-infant pairs classified as pink (identified with severe problems) were referred for inpatient care at the nearest stabilisation centre.

**Table 2** Number of infants per age group and average MUAC per age group of infants <6m who underwent full assessment

Age group	Number	Average MUAC (mean)
Less than 8 weeks	419	102.6
9 to 16 weeks	271	115.3
17 to 24 weeks	157	121.5
Total	847	110.1

**Table 3** WLZ of infants <6m who underwent full assessment

Category	Number	Percentage
SAM	76	9.0%
MAM	95	11.2%
Normal	676	79%
Total	847	100%

Until mid-June, 65 mother-infant pairs enrolled recovered, where recovery was based on having all components of the assessment for both infant and mother classified as green (clinical, feeding and anthropometric assessment for both infant and mother, and additional mental health assessment for mother). Recovery was low due to discharge criteria not being fit for the emergency response (see Challenges below). A total of 43 mother-infant pairs defaulted and one infant died.

From 78 infants referred for inpatient care, 14 were identified with SAM and eight with MAM based on WLZ criteria (remaining 58 cases had other clinical complications necessitating inpatient care).

All but one of the 847 infants were breastfed; however common breastfeeding problems such as infants not being well attached and not suckling well and infants receiving less than eight breastfeeds a day were commonly reported and contributed to a large proportion of mother-infant pairs being classified as having a 'moderate' problem. According to the assessment of maternal mental health, 3.1% (n=26) of mothers showed signs of depression/anxiety and 3.9% (n=33) indicated having a marital conflict contributing to poor mental health.

## Challenges

Field teams identified several challenges during the pilot phase of the C-MAMI approach in the Rohingya response. Firstly, it was challenging to recruit qualified staff – MAMI counsellors in particular – who had to be experienced IYCF counsellors, female and able to speak the local language. Competition with other NGOs for qualified staff further hampered this process and led to a delay

in opening of some sites. To help overcome this, during later stages of the project when new C-MAMI sites were opened, Save the Children 'transferred' high-performing IYCF counsellors from the IYCF programme to become MAMI counsellors.

High caseload numbers per site were challenging for the MAMI counsellors, especially because of the time needed for close follow-up and weekly monitoring. Enrollment was often found to be due to breastfeeding issues that could be addressed through less intensive IYCF programming in MBAs; i.e. one-to-one breastfeeding counselling providing skilled support with good positioning and attachment. Referral of severe cases was hampered by lack of accessible inpatient services and a general unwillingness of caregivers to stay in the stabilisation centres.

Specific challenges were identified related to the assessment of both mothers and infants. It was difficult to measure/identify low birth weight (LBW) infants due to the lack of health cards and the lack of a growth-monitoring programme, especially at the beginning of the response. MAMI counsellors had limited capacity (knowledge and experience) to identify risk of HIV and tuberculosis and integrated management of childhood illness (IMCI) danger signs. It was also challenging for MAMI counsellors to conduct depression/anxiety assessments and classify this appropriately; some of the standard classifications were felt to be inappropriate for this emergency context. At the time of the pilot, few mental health and psychosocial support (MHPSS) services had been put in place, limiting referral pathways for at-risk mothers. It was sometimes difficult to measure mothers' MUAC due to a lack of sufficiently private space to remove clothing.

The harsh conditions in the camp (sun, heat, dust during the dry season, and rain and mud during the monsoon season) affected the electronic weighing scales and good-quality anthropometric equipment was not available in the local market.

Despite good community mobilisation, the programme suffered from high numbers of absentees due to the programme not providing any material goods or incentives and it was often difficult for the community mobilisers and MCHN promoters to locate and follow-up all absentees/defaulters (reliable data on defaulters are unavailable due to data errors).

Commcare software was used in the programme to gather MAMI data. However, the free version of the software used did not facilitate easy analysis of data and created discrepancies with the other nutrition programmes, which all used Kobo for data entry and reporting. Additionally, the level of data collected through the Commcare system was excessive for an emergency response, with the extensive variables collected on a weekly basis for each mother and infant more suited to a stable/research setting.

In adapting the C-MAMI Tool for the response, several limitations of the tool itself were identified. The C-MAMI Tool did not accommodate the registration of orphaned infants; the only option provided is to register the infant as 'with mother'. Re-enrollment is not recorded in the C-MAMI Tool. The discharge criteria were unclear and difficult to implement in the context of this emergency. For example, the C-MAMI Tool specified that the mother's nutritional status needs to be improved before the mother-infant pair can be discharged; however, food and nutrition security was a problem in the Rohingya response, which was beyond the scope of the C-MAMI programme (aside from education and messaging). This meant that infants and their mothers were kept in the programme for a long period of time. The requirement for an infant to be feeding at least eight times per day pre-discharge also extended stay. This meant it was challenging for the MAMI counsellors to decide when to discharge and contributed to long lengths of stay, which increased risk of defaulting.

More broadly, a key challenge with the C-MAMI intervention is lack of baseline caseload data for this age group. WHZ was not assessed in this age group in the SMART surveys (it is highly challenging for community-level assessment in this age group), and while MUAC is practical and was measured, there are no recommended MUAC thresholds for infants <6m. No additional anthropometric data have been collected on this age group in the latest SMART survey. An in-depth IYCF-E assessment is being planned for September/October 2018, looking at both qualitative and quantitative indicators; there may be potential to gather data that can inform the C-MAMI plans and programmes.

## Lessons learned

Despite the gaps in quantitative caseload information, the number of SAM cases identified (9.2% of infants <6m who underwent a full assessment) and the number of mother-infant pairs at high risk who were referred for inpatient management

A MAMI counsellor admits an infant to the C-MAMI programme, Cox's Bazar, Bangladesh, 2018



Shapaine Kooik/Save the Children

clearly showed the need for an intervention at community level for this vulnerable age group.

The pilot revealed the need to adapt the C-MAMI programme to work alongside an IYCF programme with prioritisation of cases needing specialised support for enrollment in the C-MAMI programme, and other simpler cases managed under the IYCF programme.

Due to several issues with the CommCare platform during the pilot phase, the programme is transferring to KOBO Collect, a more user-friendly platform for which there existed in-house expertise and which is already used in Save the Children's nutrition programme.

The pilot in the Rohingya response in Bangladesh has directly informed adaptations to

the C-MAMI Tool, now reflected in version 2.0, to address gaps (such as discharge criteria), and to help to adapt and apply the tool in an emergency setting. Version 2.0 will be used to simplify the database to gather only crucial data found useful during the pilot phase and for future emergency response settings.

## Ways forward

The goal of the pilot phase was to develop a context-specific approach for the identification, management and follow-up of nutritionally vulnerable infants <6m in the Rohingya response. Given the burden identified through the pilot programme, Save the Children in collaboration with UNICEF are planning a response-wide roll-out of the C-MAMI approach across the Rohingya refugee camps, including identification of other health and nutrition actors capable of implementing C-MAMI. To facilitate this, a Save the Children C-MAMI consultant will design a comprehensive roll-out strategy in line with Cox's Bazar Nutrition Sector priorities, including plans for response-wide monitoring and evaluation, and develop and conduct a ToT for partner staff adapted to the C-MAMI Tool Version 2 and to the emergency context, based on the lessons learned from the pilot phase. The consultant will also document lessons learnt from Save the Children's ongoing C-MAMI programme and provide suggestions to improve quality.

An outstanding critical impediment to programming planning, monitoring and scale-up is

lack of community-friendly indicators to identify at-risk infants in the community, both in surveillance and for assessment by community-level workers.

For more information, email Anne Marie Kueter: [akueter@savechildren.org](mailto:akueter@savechildren.org)

## References

- UNICEF/WHO/World Bank Group *Joint Child Nutrition Estimates (2018) Levels and trends in child malnutrition*. Available from: [www.who.int/nutgrowthdb/estimates2017/en/](http://www.who.int/nutgrowthdb/estimates2017/en/)
- UNICEF, WHO and World Bank UN Inter-Agency Group for Child Mortality Estimation 2017. *Levels and Trends in Child Mortality Report 2017*. Available from: [www.unicef.org/publications/index\\_101071.html](http://www.unicef.org/publications/index_101071.html)
- Lopriore C, Dop MC, Solal-Celigny A and Lagnado G. (2007) *Excluding infants under 6 months of age from surveys: impact on prevalence of pre-school undernutrition*; Public Health Nutr. 2007 Jan;10(1):79-87.
- Kerac M, Blencowe H, Grijalva-Eternod C, McGrath M, Shoham J, Cole, TJ and Seal A. (2011) *Prevalence of wasting among under 6-month-old infants in developing countries and implications of new case definitions using WHO growth standards: a secondary data analysis*. Arch Dis Child 2011;96:1008-1013.
- Grijalva-Eternod CS, Kerac M, McGrath M, Wilkinson C, Hirsch JC, Delchevalerie P, Seal AJ. *Admission profile and discharge outcomes for infants aged less than 6 months admitted to inpatient therapeutic care in 10 countries. A secondary data analysis*. Matern Child Nutr. 2017 Jul 25. doi: 10.1111/mcn.12345.
- UNICEF (2018) *Adopting optimal feeding practices is fundamental to a child's survival, growth and development, but too few children benefit*. Available from: <https://data.unicef.org/topic/nutrition/infant-and-young-child-feeding/#>



# Updated C-MAMI Tool now available

The C-MAMI (Community Management of At Risk Mothers and Infants under six months of age) Tool provides a health worker with a format to assess and manage at risk mothers and infants under six months of age in the community<sup>1</sup> who are nutritionally vulnerable. Version 1 was developed by ENN, LSHTM, Save the Children and collaborators in 2015 to help fill a gap in programming guidance and catalyse case management. It has been used in several contexts since; these experiences and expert peer review have informed an update by ENN, LSHTM, Save the Children, GOAL and collaborators<sup>2</sup> to produce Version 2.0 (July 2018), funded by Save the Children and ENN (Irish Aid).

The format of the tool is modelled on the Integrated Management of Childhood Illness (IMCI) approach to facilitate integration. It may require adaptation, development of programme-specific materials and different levels of

training for implementation. It is applicable in both humanitarian and development settings.

Guiding principles governing the C-MAMI Tool management approach include:

- The term 'enrolment' rather than 'admission' is used, to avoid medicalising community level support to these infants.
- Feeding support and social support is central to outpatient management.
- The MAMI approach always considers the mother-infant pair.
- Anthropometric criteria are useful but have limitations in this age group. Feeding, clinical and maternal factors are more important to assess, guide actions and to determine discharge.
- Clinical status of infants and their medical management is particularly critical; first line action is triage to identify and refer 'complicated' cases.
- The terms 'severe' and 'moderate' acute mal

nutrition are not applied to this age group.

- Skilled breastfeeding support, is critical to case management. Non-breastfed infants need special support and follow-up.
- Currently there are no agreed MUAC cut-offs for infants < 6 months. The tool recommends collecting MUAC data to help build the evidence base.

The C-MAMI package comprises:

- C-MAMI Tool v2.0
- Counselling and support actions booklet
- Counselling cards
- C-MAMI enrolment and management card

The C-MAMI Tool is available in English at: <https://www.ennonline.net//c-mami> A word version, to facilitate adaptation, is available on request. Please contact us with feedback and experiences of using the tool, and if you are interested in/planning field testing or translation. Contact: Marie McGrath, ENN, email: [marie@ennonline.net](mailto:marie@ennonline.net)

<sup>1</sup> In 2017, MAMI was redefined from 'management of acute malnutrition in infants U6m' to 'management of at risk mothers and infants U6m' to reflect the profile of infant-mother pairs being identified, their associated risks, and consequently the wider scope of interventions needed to cater for/support them; these include but are not limited to nutrition.

<sup>2</sup> Content update was coordinated by ENN (Marie McGrath), led by Save the Children consultants (Mary Lung'aho & Maryanne Stone Jimenez (Nutrition Policy and Practice)), in close collaboration with Marko Kerac (LSHTM); Nicki Connell, Sarah Butler (Save the Children), Hatty Barthorp (GOAL) and with input from working groups formed within the MAMI Special Interest Group and expert contributors, namely: Alice

Burrell (Save the Children), Alison Talbert (KEMRI-Wellcome, Kenya), Cecile Bizouerne (ACF), Elizabetha Dozio (ACF), Indi Trehan, Jay Berkley (KEMRI-Wellcome, Kenya), Karine le Roch (ACF), Katie Beck (Partners in Health), Kirrily de Polnay (MSF), Louise Day (LSHTM), Martha Mwangowe (KEMRI-Wellcome, Kenya), Natalie (MSF), Nigel Rollins (WHO), Robert Stewart (University of Edinburgh), Zita Weise Prinzo (WHO).

# The cost of implementing the C-MAMI tool to treat nutritionally vulnerable infants in Bangladesh



Monera and her infant Samiba, Barisal, Bangladesh, 2016

Save the Children

By Natasha Lelijveld, Mostofa Sarwar, Golam Mothabbir, Sarah Butler and Nicki Connell



Natasha Lelijveld is a Research Fellow at the Centre for Global Child Health at the Hospital for Sick Kids in Toronto. She has previously worked on acute and chronic malnutrition research at University College London,

London School of Hygiene and Tropical Medicine and the No Wasted Lives initiative at Action Against Hunger.



Mostofa Sarwar is a medical doctor with five years' experience in maternal and child health and nutrition in development and emergency contexts with leading non-governmental organisations

(NGOs). He is currently the Deputy Manager- Health, Nutrition and HIV/AIDS for Save the Children in Bangladesh.



Golam Mothabbir is the Senior Advisor for Health and Nutrition at Save the Children International, Bangladesh Country Office. He has been providing technical and strategic guidance to the MAMI field research team in Bangladesh since August 2014.



Sarah Butler is the Director of Emergency Nutrition at Save the Children, US. She has more than ten years' experience in nutrition and has been leading the team since Save the Children began implementation research into C-MAMI in 2013.



Nicki Connell is currently the Eleanor Crook Foundation's Nutrition Technical Director. Nicki was previously an Emergency Nutrition Advisor for Save the Children, and served as Project Manager for this work.

She has ten years' experience in emergency nutrition, with much experience in the management of at-risk mothers and infants (MAMI).

The authors would like to thank Dr Marko Kerac from London School of Hygiene and Tropical Medicine for his academic support, Save the Children for hosting the fieldwork within their programmes, and the in-kind expertise provided by the No Wasted Lives initiative at Action Against Hunger UK.

## Location: *Bangladesh*

**What we know:** The C-MAMI tool was developed to guide the community-based management of uncomplicated cases of severe acute malnutrition (SAM) in infants under six months, as per the WHO 2013 guideline.

**What this article adds:** Save the Children carried out a calculation of the cost-efficiency of a protocol based on the C-MAMI tool in Bangladesh, compared to the standard, inpatient-based protocol. Costs were identified for both protocols, including inputs, health system costs, efficiency data (such as number of admissions/month), scale-up costs and costs to caregivers. The cost of C-MAMI to the healthcare provider (per clinic/month) was higher than the standard (USD1,007 vs USD466); however, it was found to be more cost efficient per infant treated (USD289 vs USD685). If fully integrated into the national health system, the cost of C-MAMI would reduce to an estimated USD536 per clinic/month and USD154 per infant treated. The cost for caregivers was found to be lower for C-MAMI compared to the standard (USD53 vs USD74 per caregiver/six months). Overall, the societal costs (healthcare provider + caregiver) were significantly lower in C-MAMI compared to standard (USD342 vs USD759), although both were judged to be cost-efficient.

## Background

Current treatment guidelines for severe acute malnutrition (SAM) in infants under six months are based on very weak evidence and focused on inpatient care; WHO guidance recommends community-based management for uncomplicated cases (WHO, 2013). To help fill a gap in programming guidance, the C-MAMI tool ([www.ennonline.net/c-mami](http://www.ennonline.net/c-mami)) was developed to help catalyse community-based case management. Save the Children (SC) recently tested a protocol based on the C-MAMI tool for the treatment of "nutritional at-risk" infants in Barisal district, Bangladesh, estimating its effectiveness compared to the current standard inpatient protocol (results pending).

A secondary aim of the research was to calculate the cost and cost-efficiency of this new treatment method. This economic sub-study aimed to highlight major considerations in cost differences between standard

inpatient protocol and the C-MAMI model from a societal prospective, considering costs to both the healthcare provider and caregivers.

## Method

The C-MAMI model (intervention) and standard inpatient protocol (control) were implemented in 24 community clinics in Barisal district within the Ministry of Health (MoH) system, with support from SC staff. All infants receiving C-MAMI support were requested to attend weekly counselling appointments at the clinic and received home visits as necessary.

To estimate costs, programme inputs ("ingredients") were identified and quantified and costs were assigned against these, informed by the study protocol, accounting data and expert observation. A simple decision tree was built to map the various treatment pathways in each study arm and guide the mapping of major resources for

**Table 1** Summary of cost to the health provider for the intervention and the control models

	Cost per clinic per month USD		Cost per infant screening USD		Cost per infant treated USD	
	C-MAMI N=12	Standard N=12	C-MAMI N=630	Standard N=595	C-MAMI N=251	Standard N=49
Staff at clinic	778.13	306.06	14.82	6.17	223.21	449.72
Hospital admission	80.88	102.8	1.54	2.07	23.20	151.09
Supplies	26.58	22.06	0.51	0.44	7.62	32.41
Buildings and equipment	80.86	35.07	1.54	0.71	23.20	51.53
Specialist Training	40.45	0.00	0.77	0.00	11.60	0.00
<b>Total</b>	<b>1006.91</b>	<b>466.02</b>	<b>19.18</b>	<b>9.40</b>	<b>288.83</b>	<b>684.76</b>

**Table 2** Estimated cost of a fully integrated MoH C-MAMI intervention model

	Cost per clinic per month USD	Cost per infant screening USD	Cost per infant treated USD
Staff at clinic	347.56	6.62	99.70
Hospital admission	40.08	0.76	11.50
Supplies	26.58	0.51	7.62
Buildings and equipment	80.86	1.54	23.20
Training	40.45	0.77	11.60
<b>Total</b>	<b>535.53</b>	<b>10.20</b>	<b>153.62</b>

\* Assumes that the same level of screening and treatment rates are achieved as in the current SC-supported intervention.

**Table 3** Cost to caregivers of the intervention vs control treatment protocols

Activities	Cost to Caregivers from 0-6 months USD			
	C-MAMI protocol		Standard protocol	
	Maximum*	Average per child treated	Maximum*	Average per child treated
Transport to clinic	6.51	5.41	3.77	3.16
Cost of time spent at clinics	8.03	3.01	3.57	1.33
Cost of admission for SAM	119.28	3.94	119.28	9.82
Cost of other health seeking	13.97	2.80	26.02	5.08
Cost of BMS	159.03	38.17	159.03	54.07
<b>Total</b>	<b>306.82</b>	<b>53.33</b>	<b>311.67</b>	<b>73.95</b>
Total (excluding BMS)	147.79	15.17	152.63	19.88

\* Maximum describes the scenario for a mother who is not exclusively breastfeeding and is admitted for inpatient SAM treatment. The "averaged" costs cannot be applied to individual cases as they represent the average across the whole group of mothers, including those with healthier infants who required limited intervention.

inclusion in cost calculations (Figure 1). Due to the integrated nature of the programmes, other health system costs were estimated through key informant interviews and published WHO-CHOICE values ([www.who.int/choice/costs/en/](http://www.who.int/choice/costs/en/))<sup>1</sup>. Efficiency data, such as the number of admissions per month, were calculated from interim values at the time of costing data collection.

Using information from the FANTA II Profiles results for Bangladesh, we also present the estimated cost for scaling up the implementation of the tool within an integrated health system, and this cost in relation to published government spending (Howlader, 2012).

Costs to caregivers, including direct costs and indirect time costs, were estimated through informal, anonymous interviews with a range of caregivers; programme defaulters are likely underrepresented.

## Results

There are several key differences between the C-MAMI model and the standard protocol which need to be considered from a cost perspective. The C-MAMI model has a wider range of admission criteria, including maternal health indicators, and the treatment consists largely of weekly counselling and specialised lactation advice, compared to inpatient-feeding based on infant anthropometry only in the standard protocol.

### Cost to healthcare providers

For the healthcare provider, the cost of the C-MAMI intervention was higher than the standard intervention (USD1007 vs USD466 per clinic per month), due to additional staff, staff training, tablet computers (for the MAMI app which accompanied the protocol), and capital costs of creating breastfeeding corners (Table 1). However, when this cost is applied to the number of children

treated by each clinic each month (3.5 vs 0.7), the C-MAMI intervention becomes more cost-efficient than the standard model (USD289 vs USD685 per child treated).

### Estimated cost if the C-MAMI intervention was fully integrated with national MoH

The above costs are based on the current system, which is supported by SC staff. If the C-MAMI protocol were to be fully integrated into the national health system, it would streamline and save costs. These hypothetical cost calculations include more Community Health Volunteers (CHVs) in place of Field Officers for screening, training Health Assistants to make referrals and home visits, and utilising Family Welfare Assistants to replace the role of SC Technical Officers as lactation specialists. The tablet computers would still be necessary to use the C-MAMI app. High-level staff training is still required; although associated cost and time is high, it is fundamental to the successful treatment of infants <6m and could be more cost-effectively implemented if conducted on a larger scale. Table 2 presents the summary of costs for this hypothetical "streamlined" and "fully integrated" intervention model.

If considering the scale-up to national level, based on an estimate of 17,700 community clinics in Bangladesh, the cost of implementing C-MAMI for one year at a national level would be USD114 million.

### Cost to caregivers

Despite the additional time and money spent on weekly clinic visits, the overall cost is lower for caregivers in the C-MAMI intervention than the standard protocol (average USD53 vs USD74 per caregiver for six months). The C-MAMI programme saved some caregivers the high cost of lengthy inpatient admissions and the need to seek additional private health advice. Successful relactation through the C-MAMI lactation support also saved the cost of breastmilk substitute (BMS) where applicable.

### Costs from a societal perspective

The societal cost per child treated (health provider + caregiver) by either the C-MAMI intervention (USD342) or the standard protocol (USD759) was less than the Bangladesh 2016 per capita GDP (USD1,358.8), which suggests that both models are "cost-effective". Based on estimates from a FANTA report, the cost of implementing the "integrated" C-MAMI protocol for one year at a national level (USD114million) is approximately 11% of the Bangladesh 2012 Health Promotion and Nutrition budget, which seems attainable.

This study could not calculate any additional cost-savings of the intervention in potentially preventing infant SAM cases, preventing child stunting, and reducing the burden of severe wasting in children aged 6-59 months; however, these factors should be considered by policy-makers. In addition,

<sup>1</sup> The WHO-CHOICE project (CHOosing Interventions that are Cost-Effective) has a database of region-specific costs for common health interventions to help policy-makers assess cost-effectiveness of health programmes, including for Bangladesh specifically.



Field research officers measure the weight of an infant under six months in Barisal, Bangladesh, 2016

Save the Children

it will be important to calculate the “cost per recovered” once the main study results have been analysed.

**Conclusion**

The absolute cost per clinic of the C-MAMI intervention is higher from a healthcare provider perspective than the cost of the standard control protocol, but is more cost-efficient per child treated and less costly to caregivers. A national, integrated C-MAMI intervention is potentially viable at scale. It is important to reassess cost-effectiveness of treatment approaches in light of potential SAM cases averted, if data is available. Additional cost-savings in preventing malnutrition and in reducing severe wasting burden in children aged 6-59 months should also be considered when evaluating the cost-effectiveness of the C-MAMI intervention.

For more information please contact Natasha Lelijveld at [Natasha.Lelijveld.11@ucl.ac.uk](mailto:Natasha.lelijveld.11@ucl.ac.uk) or Sarah Butler at [sbutler@savechildren.org](mailto:sbutler@savechildren.org)

**References**

Islam, M., et al., *Severe malnutrition in infants aged <6months-seasonal prevalence, outcomes and risk factors in Bangladesh: repeat cross sectional surveys and a prospective cohort study.* Under Consideration, 2018.

Islam, M.M., et al., *Risk factors for severe acute malnutrition in infants <6 months old in semi-urban Bangladesh: A prospective cohort study to inform future assessment/ treatment tools, in ACF Research Conference.* 2016, ENN Field Exchange. p. 62.

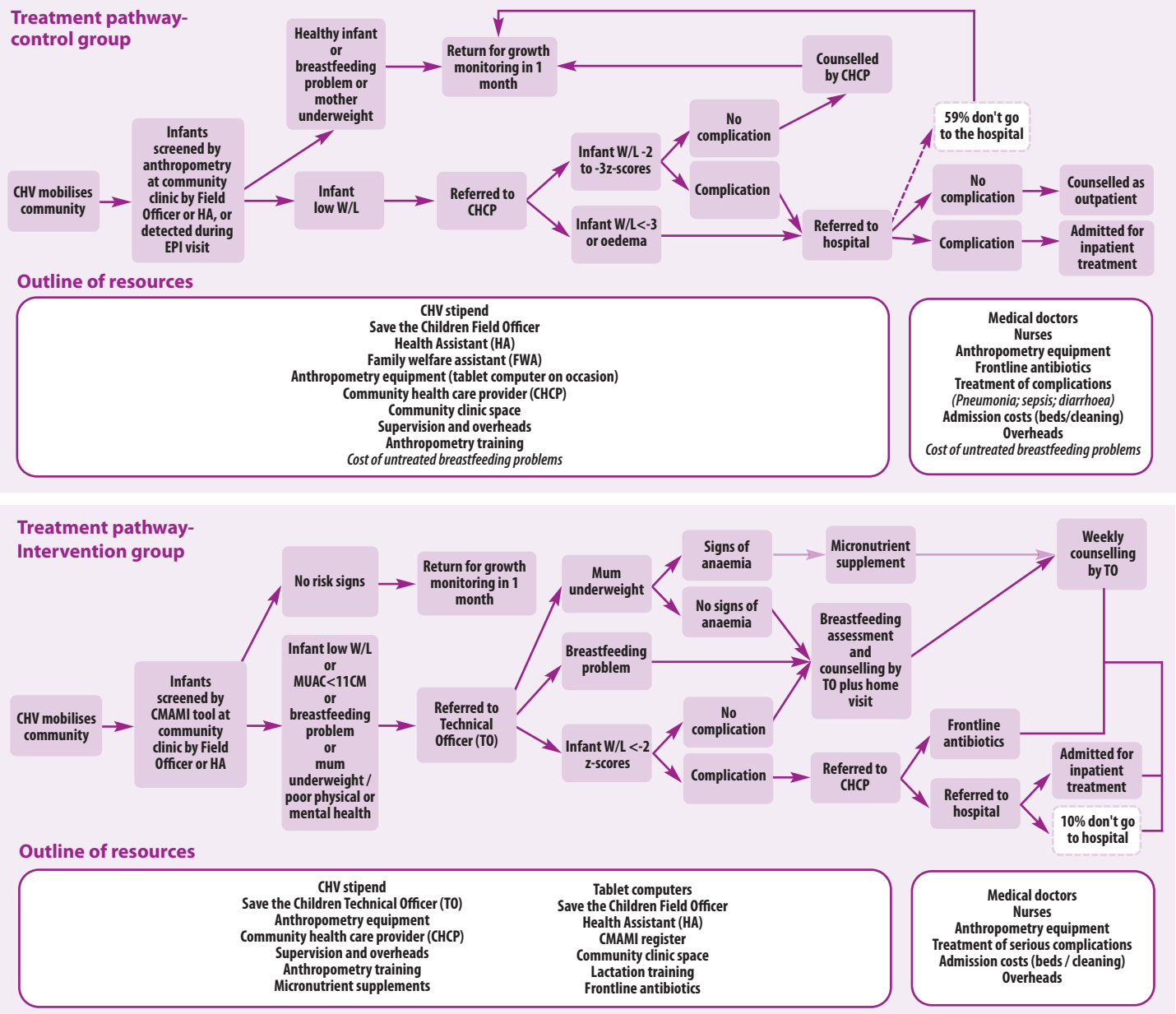
Read, S., *Improving community management of uncomplicated acute malnutrition in infants under six months (C-MAMI): Developing a checklist version of the C-MAMI tool.* *Field Exchange*, 2017. 54(February 2017): p. 30.

Howlader, S.R., et al., *Investing in nutrition now: a smart start for our children, our future. Estimates of benefits and costs of a comprehensive program for nutrition in Bangladesh, 2011–2021. PROFILES and Nutrition Costing Technical Report.* Washington DC, USA:

Food and Nutrition Technical Assistance III Project (FANTA), 2012. *Food and Nutrition Technical Assistance III Project (FANTA), FHI*, 2012. 360.

WHO (2013) *Updates on the management of severe acute malnutrition in infants and children.* Available from: [http://www.who.int/nutrition/publications/guidelines/update\\_s\\_management\\_SAM\\_infantandchildren/en/](http://www.who.int/nutrition/publications/guidelines/update_s_management_SAM_infantandchildren/en/)

**Figure 1** Decision trees for the control treatment model and the intervention treatment model



# Severe malnutrition in infants under six months old: outcomes and risk factors in Bangladesh

Summary of research <sup>1</sup>

Location: *Bangladesh*

**What we know:** The World Health Organization (WHO) recommends that infants under six months with uncomplicated severe acute malnutrition (SAM) are treated in the community.

**What this article adds:** A prospective cohort study was undertaken on infants under six months (<6m) in Barisal district, Bangladesh, of one group of 77 infants with SAM (weight for length z-score <-3 and/or bipedal oedema) and 77 non-SAM infants, all enrolled at four to eight weeks of age and followed up at six months. Maternal education and satisfaction with breastfeeding were among factors associated with SAM. Duration of exclusive breastfeeding was shorter at enrolment ( $3.9 \pm 2.1$  vs.  $5.7 \pm 2.2$  weeks,  $P < 0.0001$ ) and at age six months ( $13.2 \pm 8.9$  vs.  $17.4 \pm 7.9$  weeks;  $P = 0.0003$ ) among SAM infants. Despite referral, only 13 (17%) reported for inpatient care and at six months 18 (23%) infants with SAM still had SAM and 3 (3.9%) died. In the non-SAM group, one child developed SAM and none died. Current inpatient-focused treatment strategies have limited practical effectiveness due to poor uptake of inpatient referral. WHO recommendations of outpatient-focused care for malnourished but clinically stable infants <6m must be tested. Breastfeeding support must be central to future interventions but may be insufficient alone. Better case definitions are needed in this age group.

Severe acute malnutrition (SAM) affects around four million infants under six months old (infants <6m) worldwide, but evidence underpinning their care is of very low quality. To inform future research, the objectives of this study were to identify risk factors for infant <6m SAM and describe the clinical and anthropometric outcomes of treatment with current management strategies. A prospective cohort study was undertaken involving two groups of infants aged four to eight weeks (the age when future interventions to treat infant <6m SAM will be anticipated to begin). One group comprised 77 infants with SAM (defined as weight-for-length z-score (WLZ) <-3 and/or bilateral nutritional oedema); the other comprised 77 age- and sex-matched infants who were not severely malnourished. Exclusions were infants from twin/multiple pregnancies and those with obvious congenital anomalies that could affect feeding. The primary outcome was the proportion of infants who died or who had SAM at follow-up at age six months. Secondary outcomes were changes in and absolute values of WLZ, weight-for-age z-score (WAZ) and length-for-age z-score (LAZ). SAM 'case' infants and non-SAM infants were identified by household visits in Barisal district, Bangladesh; anthropometric measurements were taken according to standard guidelines and were recorded electronically.

By six-month endline, statistically significant differences were apparent between SAM and non-

SAM infants: daily weight gain was better among the SAM group (8.6 vs 4.3 g/kg/day,  $P < 0.0001$ ) and mid-upper arm circumference (MUAC) increase was greater (35.7 vs 13.2mm,  $P < 0.0001$ ), WLZ change was greater (2.0 vs -0.24,  $P < 0.0001$ ) and WAZ change was greater (0.9 vs -0.4,  $P < 0.0001$ ). However, there was a similar decline in LAZ of 0.6 z-scores in both groups. Maternal education and satisfaction with breastfeeding were among factors significantly associated with SAM, as well as age at time of enrolment into the study, years of maternal schooling and access to household electricity. Duration of exclusive breastfeeding was shorter at enrolment ( $3.9 \pm 2.1$  vs.  $5.7 \pm 2.2$  weeks,  $P < 0.0001$ ) and at age six months ( $13.2 \pm 8.9$  vs.  $17.4 \pm 7.9$  weeks;  $P = 0.0003$ ) among SAM infants. Despite referral, only 13 (17%) reported for inpatient care and at six months, 18 (23%) infants with SAM still had SAM and 3 (3.9%) died. In the non-SAM group, one child developed SAM and none died. Maternal mental health was worse among mothers of SAM infants with a higher mean self-reporting questionnaire (SRQ) score at baseline ( $8.4 \pm 3.6$  versus  $6.8 \pm 3.8$ ,  $P = 0.003$ ).

Results show that most infants identified as having SAM at four to eight weeks of age did not access inpatient treatment when referred as per national protocol. Deaths in this age group were higher than in the control group, but not as high as have been previously reported in inpatient studies. Although only one quarter of those with

SAM at enrolment still had SAM at six months, other anthropometric deficits were marked, including significantly more stunting (62% vs. 15%), more severe stunting (40% vs. 0%) and more underweight (68% vs. 7%). The authors discuss the fact that few of the SAM infants who were referred to inpatient care actually accessed that care is reminiscent of past experiences with older SAM-affected children. Before community-based management of acute malnutrition (CMAM), when only inpatient-based care was available, coverage for such programmes was poor due to the high direct and opportunity cost of treatment. However efficacious such inpatient-only treatments might be, their overall effectiveness and public health impact is severely limited by the low numbers of eligible patients accessing care they need. Also reminiscent of the shift from inpatient-only care to CMAM outpatient-focused models, some professionals now are concerned about the safety of outpatient care for SAM infants <6m. Addressing this concern, it is reassuring that despite the minimal (or no direct) treatment, over three quarters of infants with SAM at four to eight weeks baseline no longer had SAM at age 6 months. This may represent catch-up growth, as suggested by greater rates of weight gain in the SAM group, and emphasises infancy as a dynamic and important period of life. Nevertheless, interventions are needed: ex-SAM infants had considerably more other anthropometric deficits than infants who did not have SAM at baseline, suggesting ongoing vulnerability.

The authors conclude that the current inpatient-focused treatment approaches to infant <6m SAM are sub-optimal. Some form of treatment is needed, as suggested by infants in the SAM group being more underweight and more stunted than non-SAM controls. However, the fact that many showed weight catch-up and no longer had SAM by six months suggest that it is reasonable to classify infants in the same way as older children with SAM, recognising that some are sufficiently clinically stable ("uncomplicated SAM") to be safely managed in community-based programmes, as recommended by WHO.<sup>2</sup> In terms of risk factors, sub-optimal breastfeeding is key and breastfeeding support is likely central to future interventions, but may be insufficient alone. Further interventions should evaluate the effectiveness of a package of interventions which also addresses wider issues, such as home environment and maternal support/maternal mental health. Finally, the authors call for better ways of identifying at-risk infants. Current case definitions of SAM are widely used, but do not fully capture the many possible reasons why an infant may be small. Improved classification and understanding of underlying aetiology in individual cases may allow more tailored treatments with greater probability of success.

<sup>1</sup> Islam MM, Arafat C, Connell N, Mothabbir G, McGrath M, Berkley JA, Ahmed T and Kerac M. (2018). Severe malnutrition in infants <6 months – Outcomes and risk factors in Bangladesh: A prospective cohort study. *Maternal Child Nutrition*. 2018:e12642 <https://doi.org/10.1111/mcn.12642>

<sup>2</sup> WHO (2013) Updates on the management of severe acute malnutrition in infants and children. Available from: [www.who.int/nutrition/publications/guidelines/updates\\_management\\_SAM\\_infantandchildren/en/](http://www.who.int/nutrition/publications/guidelines/updates_management_SAM_infantandchildren/en/)

# C-MAMI tool evaluation: Learnings from Bangladesh and Ethiopia

By Sarah Butler, Nicki Connell and Hatty Barthorp



Sarah Butler is the Director of Emergency Nutrition at Save the Children, USA. She has more than ten years'

experience in nutrition and has been leading the team since SC began implementation research into C-MAMI in 2013.



Nicki Connell is the Eleanor Crook Foundation's Nutrition Technical Director. Nicki previously was an Emergency

Nutrition Advisor for Save the Children and served as Project Manager for this work. Nicki has ten years' experience in emergency nutrition, with a large proportion of her work focused on the management of at-risk mothers and infants (MAMI).



Hatty Barthorp is the Global Nutrition Advisor at GOAL. She has more than 15 years' experience in emergency and

development nutrition programming and has been advising the GOAL Ethiopia team since GOAL began implementation of C-MAMI in 2016.

Save the Children and GOAL would like to thank the following members of the Evaluation Team: Sinead O'Mahony, GOAL Ireland; Marie McGrath, ENN; Jay Berkley, KEMRI/Wellcome Trust; and Marko Kerac, London School of Hygiene and Tropical Medicine. The evaluation was led by Nutrition Policy and Practice consultants Mary Lung'aho and Maryanne Stone-Jimenez and field work was conducted by Louise Tina Day.



C-MAMI room with a private screened area for one to one counselling, Gambella, Ethiopia, 2018

Hatty Barthorp/GOAL

## Location: *Bangladesh and Ethiopia*

**What we know:** Community-based management of uncomplicated severe acute malnutrition in infants under six months is recommended by WHO; the community-based management of at-risk mothers and infants less than six months old (C-MAMI) tool was developed to help put this into practice.

**What this article adds:** An evaluation was carried out of a GOAL pilot C-MAMI project in two refugee camps in Ethiopia and a Save the Children pilot C-MAMI project in Bangladesh to test the C-MAMI approach and C-MAMI tool (Version 1). An inter-agency evaluation team conducted key informant interviews and focus group discussions and employed questionnaires, observations of assessment and management, case scenarios and a quiz for tool users. Overall findings were positive: respondents reported that infants received quicker and better treatment than previous standard care (inpatient referral). Areas for development include strengthening mother support and clarity on linkages with infant and young child feeding (IYCF) programming. The C-MAMI tool was found to have provided a necessary, comprehensive framework; areas for improvement, such as admission and discharge criteria, were identified and have informed Version 2. To support implementation, development of standard operating procedures, monitoring tools and sensitisation is needed. To aid scale-up, more research is needed to test this approach.

## Background

In 2013 the World Health Organization (WHO) released updated guidance for the identification and management of severe acute malnutrition (SAM) in infants under six months of age (U6m), including outpatient management of uncomplicated cases (WHO, 2013). To operationalise this, in 2015 the MAMI Special Interest Group (an ENN-led collaboration of researchers, practitioners and experts) developed Version 1.0 of the Community-based Management of Acute Malnutrition in Infants under six months (C-MAMI) tool. This was based on risk factors identified from studies in Bangladesh, which were led by Save the Children (Islam et al, 2018) and in Malawi, which were led by the London School of Hygiene and Tropical Medicine (LSHTM). In 2016, LSHTM led a project to adapt and test the C-MAMI tool and developed a simplified, easy-to-use checklist and supporting documentation to operationalise the C-MAMI package ([www.ennonline.net/ourwork/mami](http://www.ennonline.net/ourwork/mami)). GOAL and Save the Children initiated C-MAMI pilots to test the approach and assist in the revision of these tools.

In February 2016 GOAL began integrating C-MAMI into nutrition programming in two refugee camps in Gambella region, Ethiopia. In June 2017 Save the Children began piloting C-MAMI in government health services in the disaster-prone area of Barisal, Bangladesh, as part of an implementation research project. In No-

vember 2017 Save the Children funded an evaluation of the C-MAMI tool Version 1.0 to capture lessons learned and inform an update of the tool. To add greater value to the evaluation, GOAL funded additional data collection from Ethiopia. This article summarises the methodology, findings and recommendations of that evaluation.

## Study location and methodology

Save the Children's pilot project in Barisal Sadar, Bangladesh, was implemented by C-MAMI counsellors with either a nutrition or agriculture background who received a seven-day classroom training. GOAL's pilot project in the refugee camps of Terkidi and Kule in Gambella, Ethiopia, relied on C-MAMI nurses with either infant and young child feeding (IYCF) and/or community-based management of acute malnutrition (CMAM) experience, who received 0.5-5 days of training through a mix of classroom and on-the-job orientation. Table 1 provides a short description of nutrition programming in the implementation sites.

The evaluation was designed and carried out by an inter-agency evaluation team (see acknowledgments) using a mixed-methods approach to obtain information on user experiences with the C-MAMI programme and tool. The fieldwork con-



**Table 1** Description of implementation sites

	Bangladesh	Ethiopia
IYCF Context	Government workers trained, limited implementation	Strong maternal and IYCF programme for pregnant women and mothers with children under two years of age <sup>1</sup>
Management of Acute Malnutrition	Inpatient SAM treatment (medical college); Outpatient SAM treatment (No ready-to-use therapeutic food (RUTF) used); no supplementary feeding	CMAM by GOAL, including stabilisation centres; outpatient therapeutic programme (with RUTF); and targeted and blanket supplementary feeding.
Growth Monitoring and Promotion	No supply of growth monitoring cards	Cards supplied but not filled in

sultant worked with in-country focal points and visited both field locations for seven days each in November and December 2017. Data were collected through key informant interviews, focus group discussions (FGDs), questionnaires, observation of mother-infant assessments and management, case scenarios and an 'open book' quiz for trained tool users. The evaluation team selected 48 respondents (32 Bangladeshi and 16 Ethiopian). These included enrolled and discharged beneficiaries of the programme, trained C-MAMI tool users, community outreach workers, programme supervisors and context experts, including non-governmental organisation (NGO) and government staff and stakeholders with local programming expertise.

## Evaluation findings

### C-MAMI programme

Overall, respondents expressed appreciation of the C-MAMI programme. Senior managers in both locations agreed that the programme addresses a need that was not necessarily perceived previously. "There are less babies under six months admitted (to Stabilisation Centre) with complications because now C-MAMI prevents them getting so severe." (SC nurse: Ethiopia). There was agreement in both Bangladesh and Ethiopia that infants treated through C-MAMI recover more quickly than older children treated in CMAM (IYCF counsellor, Ethiopia; Supervisor/Manager, Ethiopia and Bangladesh).

At the same time, progress in terms of support for mothers' recuperation is needed. Respondents noted that mothers were more motivated to adhere to treatment for their infants than themselves. One respondent in Ethiopia commented that C-MAMI is perceived to be only for infants; not for mothers. In general, respondents stated that the support for mothers (nutritional and non-nutritional) needs to be strengthened. The quiz identified more misclassified cases of mothers than infants, underscoring the need to improve guidance on this section of the tool.

A consistent theme raised by respondents was the relationship between C-MAMI and IYCF programming. Many community members, outreach workers and programmers expressed confusion about the distinction between the two, saying that they were unclear as to which infants were eligible for screening and management in one programme versus the other. The quiz reinforced this finding with C-MAMI tool users, who were sometimes unclear when to assign a case among the three case management options (referral to a facility, C-MAMI enrolment or linkage with IYCF support). However, misidentification of programme enrolment does not equate with mismanagement (there is intentional overlap between these pro-

grammes), although it does highlight that distinctions, connections and synergies need to be resolved between C-MAMI and IYCF programming.

Even with the need to clarify the roles of the two programmes, respondents underscored the importance of strong relationships between IYCF and C-MAMI programmes. "The focus should be on IYCF; IYCF is for all" – with C-MAMI added alongside IYCF programming to ensure 'at-risk' mothers and infants receive appropriate care. Some implementation staff reported that an advantage of C-MAMI is the increased likelihood that IYCF concerns will be addressed. "IYCF is meant to be integrated into many service points. Because IYCF is everyone's responsibility, no one is accountable. Some doctors and sisters [nurses] are neglecting this type of task (IYCF counselling). Every provider should be oriented to the C-MAMI programme." (Programme Manager, Bangladesh). Implementation staff responses varied when asked whether C-MAMI is best suited for incorporation in a health or nutrition programme. This is likely a reflection that breastfeeding counselling is included in both or either sectors in various settings.

### C-MAMI tool

A focus of the evaluation was to gather feedback on the C-MAMI tool Version 1.0 to inform revisions. In general, respondents in both settings described the tool as "useful", "filling a gap", "comprehensive", "covers everything that the health worker needs to know to manage the infant U6m" and "user-friendly". In-depth feedback on the tool was provided by respondents and through observations of use. This feedback was incorporated in the creation of C-MAMI tool Version 2.0 (see news article in this issue).

A major area for C-MAMI improvement is related to admission and discharge criteria. Respondents discussed the need to revisit anthropometric measures and cut-offs for admission (mid-upper arm circumference (MUAC) cut-offs and use of weight-for-age (WFA)) and a need to define terms for infant assessment ('severe' vs 'moderate' weight loss; 'sharp' and 'moderate' drops across growth-chart centile lines). Respondents also noted the lack of clear discharge criteria (anthropometric measurements, minimum/maximum lengths of stay) and procedures (referral to additional nutrition services, follow-up and monitoring of outcomes).

Respondents also commented on the monitoring tools associated with the C-MAMI tool. Currently there are no standardised reporting and recording formats for C-MAMI. In Ethiopia, all forms are paper-based, while Save the Children's programme in Bangladesh uses both a tablet-based C-MAMI app and paper forms for assessment,

classification and programme monitoring. In all locations respondents requested data collection processes and tools to be streamlined and duplications eliminated.

## Feasibility of scale-up

In relation to the feasibility of scale-up and sustainability, stakeholders in both settings requested more evidence to support the C-MAMI approach, including the underlying need and programme objectives, component interventions and a monitoring strategy. Several senior managers mentioned that confusion had been caused by the lack of standard operating procedures, protocols, procedural manuals and standardised operational tools (i.e. training curricula and reporting formats). In both contexts, senior-level respondents emphasised the need to pilot C-MAMI with government health workers (described by one respondent as the real target users). Respondents also indicated that sensitisation is needed from national to community levels to increase the understanding and buy-in for C-MAMI.

## Recommendations

The following key recommendations emerged from the evaluation, some of which were incorporated into C-MAMI tool Version 2.0:

1. Create a simpler, user-friendly C-MAMI tool; unify and streamline triage, assessment, classification and management of the infant-mother pair.
2. Develop guidance on the use of the C-MAMI tool; include greater guidance on counselling and describe changes from Version 1.0 to 2.0.
3. Clarify admission and discharge criteria, as well as follow-up procedures once discharged.
4. Strengthen guidance on maternal depression/anxiety/distress.
5. Develop a standardised C-MAMI training curriculum.
6. Simplify and standardise monitoring guidance, including a minimum set of monitoring indicators.
7. Conduct further research on the burden of malnutrition in U6m and key operational questions (anthropometric thresholds and non-nutrition issues, such as maternal depression and adolescent pregnancy); advocate for routine data collection on infants U6m in national and sub-national prevalence surveys.
8. Consider an advocacy and sensitisation campaign to mobilise support for C-MAMI.

Partners are now seeking to pilot the revised tool to gather user feedback for continued improvement.

For more information, please contact Sarah Butler at [sbutler@savechildren.org](mailto:sbutler@savechildren.org)

## References

WHO. *Guidelines: Updates on the management of severe acute malnutrition in infants and children*. Geneva: World Health Organization; 2013.

Islam MM, Arafat Y, Connell N, Mothabbir G, McGrath M, Berkley JA, Ahmed T, Kerac M. (2018). *Severe malnutrition in infants aged <6months – Outcomes and risk factors in Bangladesh: A prospective cohort study*. *Matern Child Nutr.* 2018; e12642. <https://doi.org/10.1111/mcn.12642>

<sup>1</sup> The programme is delivered in a '1,000 days room': a dedicated, quiet and comfortable area within the CMAM programme; mothers can relax to feed, discuss concerns and be supported as a group or individually, through counselling and practical support.

Health workers providing integrated outreach services in Sana'a governorate, 2017

Najwa Al Dheeb

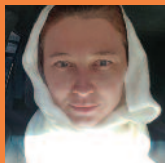
## Experiences of implementing CMAM in Yemen and number of deaths averted

By Najwa Al-Dheeb, Anna Ziolkovska and Stanley Chitekwe



Najwa Al-Dheeb is the Health and Nutrition Specialist for UNICEF Yemen and the central zone Nutrition Cluster Coordinator. Najwa holds two Masters degrees in Public Health and

Community Medicine. She has over 13 years' experience in the public sector and nutrition in both emergency and development contexts. She has worked on projects in Yemen, Nepal, Nigeria, Kenya, UK and United Arab Emirates (UAE).



Anna Ziolkovska is the Nutrition Cluster Coordinator in Yemen. Anna has a PhD and over ten years' experience in nutrition, humanitarian assistance, cluster coordination,

information management, capacity-building and project management at HQ and country level, including in South Sudan, Somalia, Philippines, Ukraine, Afghanistan and Yemen.



Stanley Chitekwe is the Chief of Nutrition for UNICEF Nepal, providing support in the writing of this article. He has worked with UNICEF in Africa and now south Asia for more than 18 years. He

has a special interest in the prevention and treatment of acute malnutrition, micronutrient deficiency and stunting and is a mentor to many nutrition professionals.

### Location: Yemen

**What we know:** Yemen is home to one of the worst protracted humanitarian crises globally.

**What this article adds:** The estimated prevalence of acute malnutrition in Yemen has risen during the current conflict. Community-based management of acute malnutrition (CMAM) programming, introduced in 2009, has evolved to meet increased caseload and now includes mobile teams, integration with vaccination and community health worker services, and increased geographical coverage. Progress is reflected in significant improvement in cure rates, defaulter rates and estimated number of deaths averted (over 221,669 deaths of children under five years old were averted between 2012 and 2017). Management of acute malnutrition (MAM) treatment scale-up has not kept pace with severe acute malnutrition (SAM) treatment (48% versus 72% geographical coverage). Further quality improvements and coverage are hampered by low funding for CMAM in 2016-2017, import restrictions on supplies, limited access, limited numbers of community health volunteers (CHVs) and unpaid health worker salaries. Critical actions being taken to scale-up quality CMAM programmes further focus on outreach; greater scale-up of MAM treatment; securing urgent funding to support life-saving treatment services, especially in high-risk districts; and livelihood interventions to help alleviate food insecurity.

### Background

Yemen is one of the poorest countries in the world, ranked 168 out of 188 (2016) on the United Nations Development Programme (UNDP) Human Development Index (UNDP, 2016) with a poverty rate in 2017 of over 62% (World Bank, 2017). Yemen has suffered from internal conflicts and clashes for several years, resulting in severe disruptions of services, lack of security for the population and 3.2 million internally displaced people (IDPs) (YHNO, 2018). One of the worst protracted humanitarian crises globally, the country now faces unprecedented displacement, a sharp rise in the price of basic commodities, food insecurity, high levels of unemployment, poverty and malnutrition, outbreaks of communicable diseases (particularly water-borne diseases) and risk of famine. An estimated 22.2 million people (76% of the population) are now in need of humanitarian or protection assistance, including 11.3 million who are in acute need (YHNO, 2018). More than 274 health facilities have been destroyed or damaged due to air strikes or ground fighting and only half of all health facilities are functioning; even these face severe shortages in medicines, equipment and staff, with non-payment of salaries being a common problem (YHNO, 2018).

The situation in the country is greatly affected by the huge deterioration in the economy. Gross domestic product (GDP) fell by 41.8% between 2015 and 2017 and continues to decline, while the Yemeni Riyal (YR) has devalued at an alarming rate (from YR215 to the US dollar in 2015 to YR500 to the US

dollar in 2017)<sup>1</sup>. Prices of fuel and basic commodities continue to rise as the purchasing power of Yemeni families falls and livelihood opportunities continue to diminish or disappear, further limiting people's access to healthcare and food. As a result, millions of people are now unable to meet their basic needs independently; recent estimates are that 17.8 million people (60% of the population) are food-insecure and 8.4 million (29% of the population) are severely food-insecure and at risk of starvation. These factors combined are bringing the country ever closer to famine: a total of 107 out of 333 districts are now facing heightened risk of famine, an increase of 13% since April 2017 (YHNO, 2018).

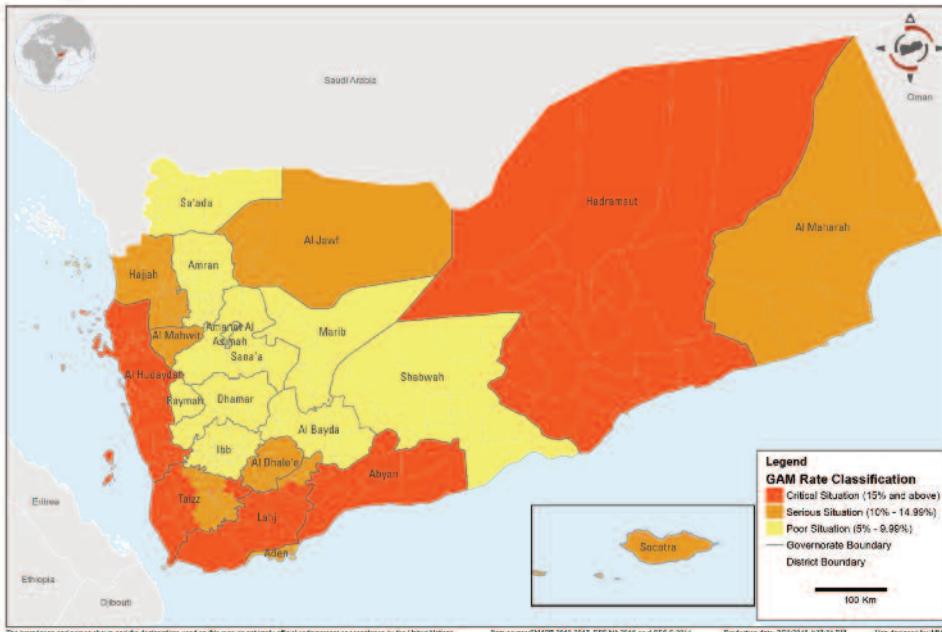
Yemen has historically had one of the highest rates of chronic malnutrition in the world; close to 60% of children were stunted in 2003<sup>2</sup>, which had reduced to 41% in 2013 before conflict broke out<sup>3</sup>. Recent estimates are that 1.8 million children under five years old (15%) and 1.1 million pregnant or lactating women (PLW) are now acutely malnourished, including approximately 400,000 children under five years old who are suffering from severe acute malnutrition (SAM) (YHNO 2018). Global acute malnutrition (GAM) rates are as high as 27-31% in some locations (YHNO, 2018). The severity of GAM according to district is shown in Figure 1.

<sup>1</sup> Socioeconomic update, Ministry of Planning and International Cooperation, issue 30, December 2017.

<sup>2</sup> Yemen Family Health Survey, 2003.

<sup>3</sup> Yemen Demographic Health Survey, 2013.

**Figure 1** Yemen Nutrition Cluster GAM rate classification, February 2018



This article shares the experiences of managing acute malnutrition in the Yemeni context, including the many challenges but also progress made in spite of a hugely difficult operational environment and escalating needs.

**Approaches used in Yemen to manage acute malnutrition**

In response to the prevalence of SAM in Yemen the first SAM management protocol was developed in 2005. The Government of Yemen and partners subsequently initiated emergency nutrition interventions in 2009, including community-based management of acute malnutrition (CMAM). The nutrition-cluster approach was adopted and initiated in Yemen in August 2009. The steady increase in the acute malnutrition

caseload necessitated the development of an interim CMAM guideline in 2013 (based on the 2005 guideline), which was revised in 2017<sup>4</sup>, including training modules and a community-outreach strategy to increase coverage.

The CMAM programme is implemented through fixed health facilities, mobile teams (MTs) and integrated immunisation campaigns, outreach<sup>5</sup> and community health volunteers (CHVs) (see Figure 2). The programme was initially implemented through fixed health facilities only; however, only 60% of the population had access to health services, a situation which deteriorated further as a result of the conflict; by 2018 only 50% of health facilities were functional (YHNO, 2018). The Government and partners broadened the implementation modalities to improve access and coverage; for example, by integrating the nutrition component into vaccination campaigns and using MTs to reach remote areas with no existing fixed health institutions, conflict-affected areas where services have been obstructed, and displacement areas. This was guided by a 2015 Ministry of Health (MoH) technical and financial plan to aid implementation and standardise partner efforts. The Government

has also invested in growth monitoring of children under five years of age and the promotion of appropriate infant and young child feeding (IYCF) practices. The number of IYCF 'corners' located in health facilities increased from 17 in 2012 to 826 in 2017 as a result (although this still falls far short of needs and is not currently growing in line with CMAM expansion). IYCF awareness-raising is included in the MTs through health workers and/or CHVs.

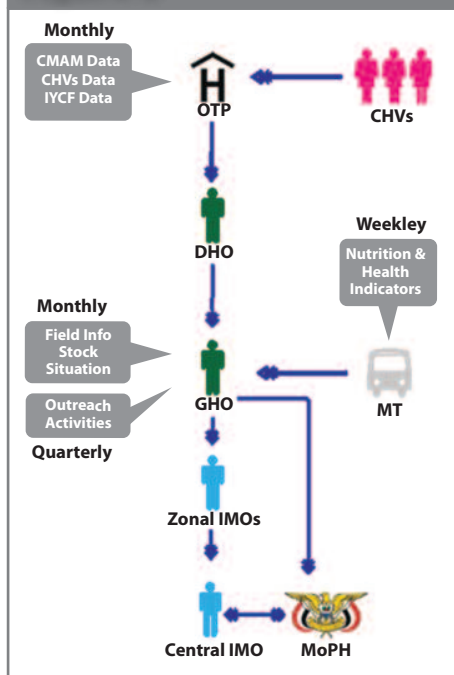
CHVs: community health volunteers; OTP: outpatient therapeutic programme; CMAM: community-based management of acute malnutrition; IYCF: infant and young child feeding; MT: mobile team; DHO: District Health Office; GHO: Governorate Health Office; IMOs: information management officers; MoPH: Ministry of Public Health.

**Scaling up CMAM in Yemen**

To track CMAM scale-up and improve quality and standardisation of data collected, the Government and partners developed a unified reporting tool and mechanism in 2013-2014, which has since been revised on a yearly basis to accommodate latest information needs. Data flows from community level via CHV reports to each health facility outpatient therapeutic programme (OTP), to the district-level health office then to governorate-level health office and finally to the Ministry of Public Health and Population (MoPH), as shown in Figure 2.

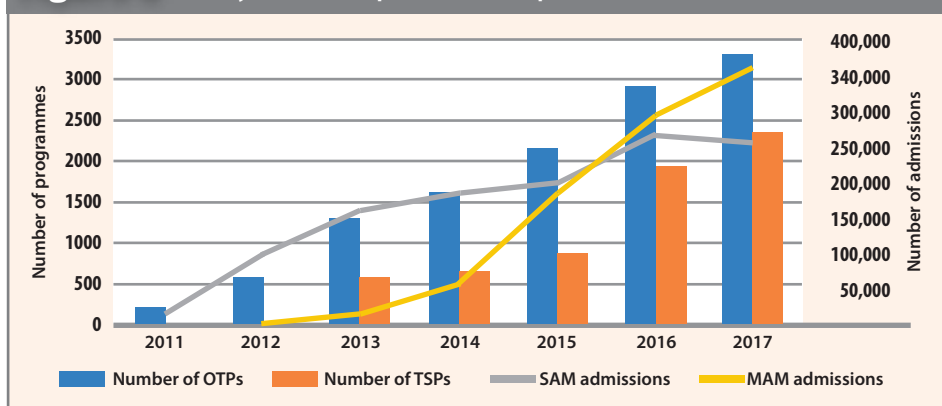
While the majority of interventions were originally implemented through the MoPH, the presence of humanitarian agencies implementing CMAM has doubled since 2013 to 34 partners. There is now an increased interest by the international community in funding CMAM programmes in Yemen and since the risk of famine was declared in 2017, additional resources have been mobilised. A number of 'traditional' donors such as the United States Agency for International Development (USAID), European Civil Protection and Humanitarian Aid Operations (ECHO) and the UK Department for International Development (DFID) provided funding to both United Nations (UN) agencies and non-governmental organisations (NGOs), while pooled funding (Yemen Humanitarian Pooled

**Figure 2** Cost per strata in different countries in US\$



<sup>4</sup> CMAM interim guideline, 2013.  
<sup>5</sup> Yemen Health System Profile. WHO, 2006.

**Figure 3** Variety of Food Groups Consumed – April 2017 and December 2013



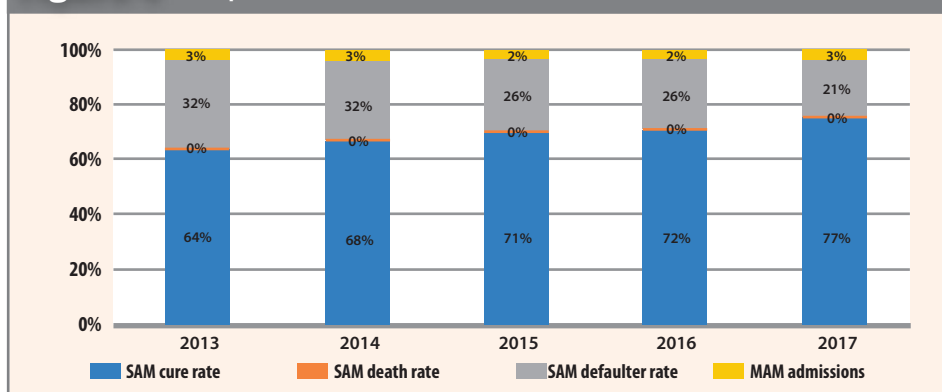
Funds and the Central Emergency Response Fund (CERF) managed by the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) is used to fund priority locations and projects with funding gaps. In 2017 the World Bank also began funding projects in Yemen that directly and indirectly support the scaling-up of the CMAM programmes. This resulted in US\$127.1 million (69.7% of requirements) received for Nutrition Cluster interventions in 2017, compared to US\$39.8 million (56.4% of requirements) in 2014 before the escalation of the conflict. Some of these funds have been used to build the capacity of the MoPHP to monitor and evaluate CMAM programmes and carry out joint CMAM missions between the MoPHP, NGOs and UN agencies.

Standard CMAM training packages were developed for health workers and CHVs by the MoPHP with technical and financial support from UNICEF. The training was rolled out across the country by a pool of MoPHP-qualified trainers to both government and NGO workers. Over 10,000 health workers have been trained on the CMAM package to date; training has been delivered on the provision of nutrition services as part of the primary healthcare package in OTPs and the integration of nutrition services into MTs and vaccination outreach. In addition, to increase CMAM coverage, over 16,500 CHVs have been trained in community sensitisation and the provision of basic services, including awareness-raising, screening, referral and follow-up of acutely malnourished children and PLWs.

The programme has scaled up steadily since 2011, as shown in Figure 3. In 2017, 330 (11% more than in 2016) additional OTPs and 436 (22% more than in 2016) additional therapeutic supplementary feeding programmes (TSFPs) were established. Over half a million children were admitted to the CMAM programme in 2017, which is one quarter of the projected caseload. However, in spite of the geographical scale-up (72% and 48% for OTPs and TSFPs respectively), the number of admissions remained similar in 2017 compared to 2016 for both SAM and MAM treatment programmes (as per the data currently available in the Nutrition Cluster). In addition, TSFP scale-up did not match OTP scale-up, which explains the low admission rate of MAM cases from 2009 to 2016, even though MAM caseload is four to five times the SAM caseload (as shown in Figure 3).

There are several contributing factors to this: first, not all reports for CMAM treatment have yet been received (there are still 117 reports missing from OTPs and 30 reports missing from TSFPs from MoPHP); these are expected to significantly increase the number of new admissions to CMAM programmes. Second, outreach services in Yemen remain weak, with less than 25% of needed CHVs currently in place and a limited number of mobile teams. Third, health workers have not received salaries for more than two years and there are competing priorities in the health system, such as the cholera outbreak, which impacted CMAM programme implementation. Fourth, the deteriorated economic situation has severely affected the population's ability to seek services, including those for malnutrition treatment. The integration of MUAC screening into the polio campaign in October 2017 increased active case findings; over 65,500 and 227,000 children under five years old were found to be severely acutely malnourished and moderately acutely malnourished respectively.

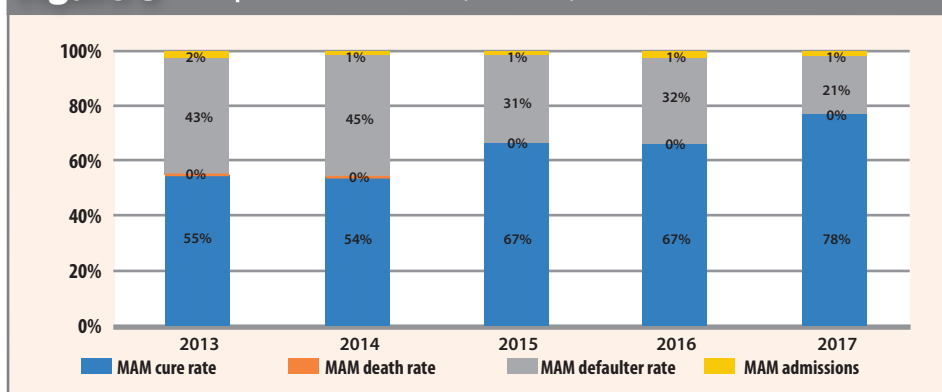
**Figure 4** SAM performance indicators (2013-2017)



**Performance of the CMAM programme in Yemen**

Many quality issues remain in the CMAM programme in Yemen and some standards fall below SPHERE indicators, although there has been encouraging improvement in programming quality over the last few years.

**Figure 5** MAM performance indicators (2013-2017)



SAM cure rates increased significantly from 64% in 2013 to 77% in 2017 and the numbers of defaulters and deaths among children also reduced (Figure 4). Similarly, for MAM treatment, cure rates increased from 55% to 78% in the districts where the programmes were implemented, also due to decreased number of defaulters, which correlates with less stockouts of supplies (Figure 5).

Despite this progress, the programme faces many bottlenecks. While there have been significant increases in funding (described above), funding remains below necessary levels (the CMAM programme was only 69.7% funded in 2017), especially for the MAM and PLW acute malnutrition treatment component. Another constraint is the restrictions on commercial and



A malnourished child from Dhamar who has been screened and is receiving treatment through integrated mobile team services, 2017

humanitarian imports and distribution, which has led to general reduction in food availability in the country, thus leading to increased food insecurity and increased caseloads for CMAM programmes. Furthermore, access, movement and activities in certain governorates/districts are restricted due to the escalation in the conflict, cumbersome bureaucratic impediments and complex clearance mechanisms. The capacity of NGOs in Yemen also remains low; one of the main contributing factors to this is the difficulty of obtaining visas and bringing international humanitarian personnel into the country to complement and build national capacity. Limited numbers of CHVs and cessation of health workers' income create additional pressures, as previously mentioned.

### Deaths averted by the CMAM programme in Yemen

SAM carries a high risk of death and requires therapeutic treatment for recovery, which highlights the importance of CMAM scale-up. To estimate deaths averted by the CMAM programme in Yemen, the same equation as used in a CMAM programme in Nigeria (Bulti et al, 2015) was applied, as recommended by the Global Nutrition Cluster (GNC) to estimate the number of lives saved in one year for use in advocacy. In this equation,  $DA = EM * PC * NT$  (where DA is the estimated number of deaths averted by the CMAM programme; EM is the expected excess mortality in untreated SAM cases with similar severity of wasting to those treated by the programme; PC is the proportion of SAM cases cured by the programme and NT is the number of SAM cases treated by the programme). Yemen's cure rate, caseload and under-five mortality for the last six years were used and, similar to the Nigerian study, an estimate of mortality associated with MUAC was used, based on published data on mortality associated with MUAC in untreated SAM cases (Briend and Zimicki, 1986; Briend et al, 1987 and Vella et al, 1994). Using these calculations, in 2017 alone 260,000 children under five years old were admitted to the SAM programme (OTPs), over 50,000 of whom were saved from death, which is around 20% of cases admitted. Over the last six years, during which time around

1.2 million children under five years old were admitted to OTPs, it is estimated that over 221,600,000 children were saved from death, which is around 19% of the cases admitted. These calculations serve to emphasise the impact of the programme on deaths averted; the limitations addressed in the original study apply here also. While this is a good achievement, quality CMAM scale-up in Yemen with increased focus on equity to reduce defaulters and increase access would save many more children's lives in the country.

### Future recommendations for CMAM programming in Yemen

In light of progress made in the treatment of acute malnutrition, challenges experienced and lessons learned, several key actions are needed in Yemen to improve CMAM programming.

Further scale-up of quality CMAM programmes is necessary, focusing on community outreach-supported activities to improve access and utilisation. CMAM components must be scaled up in parallel to cover SAM, SAM with complication and MAM children; slow scale-up of MAM services for children is an important bottleneck. An urgent appeal should be issued to all major humanitarian donors to fund CMAM as a critical life-saving activity, especially in districts at high risk of sliding into famine. Continuous advocacy for secure humanitarian access and facilitation of importation and distribution of goods is also critical.

Plans for 2018 aim to address some of the constraints mentioned in this article. Cluster's geographical coverage of CMAM will be increased to 85% of functional health facilities (for SAM treatment throughout the country and for MAM treatment in priority districts), including scaling up MTs from 113 to 200. This also includes scaling up current TFCs in the country from 49 to 85 during 2018, based on a detailed scale-up plan. To avoid duplication and fill gaps, all new programmes are now mandatorily coordinated with the DHOs and GHOs and are open in those areas most in need, based on the results of micro-assessments and knowledge of the situation. An additional 15,000 CHVs will be trained and supervised to support scale-up, and

several capacity-building activities will take place among different cadres through the MoPHP for sustainability of nutrition efforts in the field. In 2018 the MoPHP, with UNICEF support as the Nutrition Cluster lead, aims to improve the quality of monitoring and supervision visits by the GHOs and DHOs by ensuring that each monitoring visit provides an opportunity to increase programme quality through the provision of immediate mentoring to overcome identified problems. An online system for CMAM reporting is also being finalised to improve the quality of reports submitted and availability of information for all partners.

Additionally UNICEF, World Health Organization (WHO) and UNDP projects, funded by the World Bank, aim to support the functioning of health facilities. This will indirectly contribute to better coverage of CMAM services and support CMAM scale-up.

IYCF activities, an important prevention component of CMAM programmes, while also scaled up year by year, remain below necessary levels. In response the Nutrition Cluster is planning to develop guidance on 'IYCF corners' to make them standard within all services and to more than double the number of CHVs trained in IYCF to provide health education in communities.

A bottleneck analysis is planned for CMAM programmes in Yemen in 2018 to identify key bottlenecks and to develop a plan on addressing them to improve CMAM programming further. Addressing the immediate and underlying causes of acute malnutrition is also necessary in order to decrease the CMAM caseload in the country. The Nutrition; Water, sanitation and hygiene (WASH); Health; Food Security; and Agriculture Clusters are now working together to develop and pilot an integrated famine-risk reduction approach in Yemen.

For more information, please contact Najwa Al Dheeb at [naldheeb@unicef.org](mailto:naldheeb@unicef.org)

### References

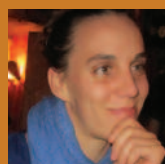
- Briend A, Zimicki S, *Validation of arm circumference as an indicator of risk of death in one to four-year-old children*, Nutr Res, 1986;6:249-261
- Briend A, Wojtyniak B, Rowland MGM, *Arm circumference and other factors in children at high risk of death in rural Bangladesh*, Lancet, 1987;26:725-727
- Bulti A, Chitekwe S, Puett C and Myatt M. (2015). *How many lives do our CMAM programmes save? A sampling-based approach to estimating the number of deaths averted by the Nigerian CMAM programme*. Field Exchange 50, August 2015. p38. [www.ennonline.net/fex/50/deathsavertedcmamnigeria](http://www.ennonline.net/fex/50/deathsavertedcmamnigeria)
- Vella V, Tomkins A, Ndiku J, Marshal T, Cortinovis I, *Anthropometry as a predictor for mortality among Ugandan children allowing for socio-economic status*, Eur J Clin Nutr, 1994;48:189-197
- UNDP (2016) Human Development Index. Available from: <http://hdr.undp.org/en/content/human-development-index-hdi>
- World Bank (2017) *Toward a blueprint for the recovery and reconstruction of Yemen*.
- YHNO (2018). *Yemen Humanitarian needs overview, 2018*. Available from: [www.unocha.org/yemen](http://www.unocha.org/yemen)

# Implementation of nutrition surveys using SMART methodology in sub-Saharan Africa

By Jana Daher, Fanny Cassard, Sara Gari, Victoria Sauveplane-Stirling, Mara Nyawo and Patrick Codjia



Jana Daher is the SMART Project Officer at Action Against Hunger Canada. She is a nutritionist, public health professional and epidemiologist with extensive international experience in managing and evaluating programmes and research projects.



Fanny Cassard is an independent nutrition consultant whose main expertise is the implementation of nutrition surveys using SMART and SENS methodologies. She has ten years' experience in doing surveys at small-scale and national level with Action Against Hunger, UNICEF and UNHCR.



Sara Gari is a research, monitoring and evaluation specialist with over ten years' experience in nutrition and health programmes in both humanitarian and development contexts, including with UNICEF West and Central Africa Regional Office as the regional nutrition monitoring and surveillance specialist.



Victoria Sauveplane-Stirling is the former Senior Program Manager at Action Against Hunger Canada, where she led the Global SMART Initiative to enhance the quality and timeliness of nutrition data for decision-making purposes.



Mara Nyawo is a nutrition specialist with UNICEF Eastern and Southern Africa Regional Office. She is a public health nutritionist with over 15 years' experience in humanitarian and development contexts in sub-Saharan Africa.



Patrick Codjia is the Chief of Nutrition for UNICEF Kenya. Prior to this he worked for UNICEF Eastern and Southern Africa Regional Office and UNICEF Country Offices in Malawi, Democratic Republic of Congo and Botswana on both development and emergency nutrition programmes.

The authors would like to thank UNICEF Country Offices, government and non-governmental organisation partners and counterparts in the countries included in this review for their support in providing contextual information and reports to enable the review.

The findings, interpretations and conclusions in this article are those of the authors. They do not necessarily represent the views of UNICEF, its executive directors, or the countries that they represent and should not be attributed to them.

Fanny Cassard

## Location: *Sub-Saharan Africa*

**What we know:** SMART Methodology (field survey method) is widely used in sub-Saharan Africa by governments and partners at national, sub-national and lower level in nutrition surveillance and early warning systems.

**What this article adds:** A recent UNICEF/Action Against Hunger review examined the implementation of SMART surveys across sub-Saharan Africa (45 countries) and the factors that have facilitated their institutionalisation. Thirty-two countries had implemented SMART surveys. Regional differences exist; annual national nutrition surveys in West and Central Africa help reach a consensus on an individual country's nutrition situation; in East Africa, sub-national surveys driven by emergencies are more typical. Average costs are US\$21,1000 (national surveys) US\$15,050 (small-scale surveys). Good government buy-in through the process, quick data analysis turnaround and strong communication and advocacy with coordination systems are key to realising added value. Areas for improvement include mapping of capacity-development needs, harmonising timing for data collection and tools, and examination of frequency of small-scale surveys to facilitate sustainability. Further research needs include a systematic review of the quality of SMART surveys.

## Introduction

The SMART (Standardised Monitoring and Assessment of Relief and Transitions) Methodology<sup>1</sup> is a standardised, simplified, cross-sectional field survey method designed to aid the collection of quality, up-to-date and timely nutrition data necessary for decision-making. The methodology was developed to harmonise methods for nutrition assessments, especially during emergencies. Today, national health ministries and partners such as international non-governmental organisations (NGOs) and United Nations (UN) agencies use the SMART Methodology to conduct nutrition surveys in both emergency and development contexts.

This use of the methodology illustrates the need for regular, reliable data for nutrition indicators at national level to track progress towards global targets. Across West and Central Africa (WCA), the first National Nutrition Surveys (NNS) using the SMART methodology were conducted in Niger and Mauritania in 2006 and have since been conducted in 15 more countries<sup>2</sup>, largely driven by UNICEF with support from Action Against Hunger. Sub-national or smaller-scale (county/district-level) SMART nutrition surveys have also been implemented in WCA countries, including Cameroon and the Democratic Republic of Congo (DRC). In contrast, in Eastern and Southern Africa (ESA), the SMART methodology has generally been used for sub-national and smaller-scale nutrition surveys, with the first NNS conducted in 2014 in Tanzania.

After over a decade of implementing SMART nutrition surveys across sub-Saharan Africa, a review of key processes, steps and tools used to implement the different types of SMART survey (national, sub-national and small-scale) was carried out, under a partnership cooperation agreement between UNICEF WCA and ESA Regional Offices and Action Against Hunger Canada between November 2015 and May 2016. Its primary objective was to document lessons learned and highlight shortcomings related to planning and implementation processes of SMART surveys in various sub-Saharan African countries, including coordination mechanisms, implementation and use of results. In addition, the implementation of the first SMART NNS in Tanzania and the institutionalisation of SMART NNS in Burkina Faso were examined in more detail.

<sup>1</sup> For more information on SMART (Standardized Monitoring and Assessment of Relief and Transitions): <http://smartmethodology.org/>

<sup>2</sup> Burkina Faso, Central African Republic, Gambia, Guinea, Mali, Mauritania, Nigeria, Niger, Senegal, Sierra Leone, Togo, Guinea Bissau, Ivory Coast, Chad and Liberia.

**Table 1** Summary of selection criteria and country categorisation

Country categorisation	Selection criteria
<b>Category 1: NNS using SMART methods</b> Government leads the survey implementation process (Mali, Senegal, Burkina Faso, and Tanzania <sup>4</sup> )	<ul style="list-style-type: none"> <li>• NNS being used</li> <li>• Existence of an EWS</li> <li>• Government leads NNS using SMART</li> <li>• Development/routine context</li> </ul>
<b>Category 2: Regional and small-scale nutrition surveys using SMART methods</b> Partners lead the survey implementation process (Cameroon, DRC, South Sudan, Kenya and Madagascar)	<ul style="list-style-type: none"> <li>• High- or low-density of small-scale SMART surveys</li> <li>• No EWS</li> <li>• Humanitarian context or development/routine context</li> <li>• Nutrition partners conduct SMART surveys</li> </ul>
<b>Category 3: Little or no data from SMART surveys.</b> (Malawi and Mozambique <sup>5</sup> )	<ul style="list-style-type: none"> <li>• No- or low- density of small-scale SMART surveys</li> <li>• No EWS</li> <li>• Humanitarian context (if applicable)</li> <li>• No partners conducting SMART surveys</li> </ul>

**Table 2** Process-specific findings

Coordination mechanisms	Implementation	Use of results
<ul style="list-style-type: none"> <li>• <b>Technical committees (WCA) and Nutrition Information Technical Working Groups (NITWGs in ESA) ensure proper survey coordination efforts and compliance with SMART recommendations.</b></li> <li>• <b>Coordination between the government and the different technical and financial partners was found to be satisfactory during the planning, implementation and result validation/dissemination phases.</b></li> <li>• <b>Valuable contribution to the decision-making of NITWGs: Integrated Phase Classification (IPC)/Cadre Harmonisé analyses, caseload estimations for acute malnutrition, nutrition information trends and analysis.</b></li> </ul>	<ul style="list-style-type: none"> <li>• The implementation processes (i.e. survey protocol development, training and standardisation test) are similar across countries and contexts (humanitarian/development) and comply with SMART technical recommendations.</li> <li>• Governments are becoming increasingly independent from outside technical support, including SMART consultants.</li> <li>• Raising and securing funds to carry out nutrition surveys, particularly NNS, was found to be a bottleneck.</li> </ul>	<ul style="list-style-type: none"> <li>• Results are used for nutrition programming and as tools for advocacy and lobbying for the mobilisation of resources and are included in early warning systems (EWS) to enhance responses to crises and emergencies.</li> <li>• Continuous interest is noted from all stakeholders in SMART surveys, with results (specifically anthropometric measurements) being considered as benchmarks for nutrition data.</li> <li>• Data collected on women of childbearing age is used in several countries to highlight the nutrition transition underway.</li> </ul>

## Methods

All 45 countries across UNICEF ESA and WCA regions were considered for this review. Countries were classified into three categories (Table 1), based on their national information systems. Using data compiled by UNICEF WCA and ESA offices between 2013 and 2015, this included the type of SMART survey conducted (national, small-scale or none); frequency and density of SMART survey (“low” meaning 1-10 SMART surveys conducted annually; “high” meaning > 10 SMART surveys conducted annually); existence of an early warning system (EWS); and key partners in their implementation. Two main uses of SMART surveys were identified: humanitarian crises (when a SMART survey is conducted in response to a specific crisis situation and is carried out to provide guidance on the allocation of resources and emergency programmes); and in a development context (when a SMART survey regularly contributes data to nutrition surveillance systems).

For each of the three categories, a minimum of two countries with different characteristics were chosen to make up the representative sample of 11 countries (Table 1). Secondary data analysis was undertaken in the first half of 2016.

UNICEF’s regional offices<sup>3</sup> shared all documents related to SMART surveys conducted between 2013 and 2015, including schedules, budgets, tools and final reports. Additional information on implementation processes were collected from key informants directly involved in SMART surveys at country level via emails, teleconferences, meetings and interviews.

## Findings

SMART Methodology is widely used in sub-Saharan Africa by governments and partners to conduct timely nutrition surveys in all contexts and on a regular basis, often coinciding with seasonal variations, at national, sub-national and smaller-scale levels. The review found that 32 out of 45 countries had implemented SMART surveys between 2013 and 2015, contributing to the harmonisation of nutrition rapid assessment methods across the region. The use of NNS led by governments also contributed to achieving consensus on the national nutritional situation in nine countries<sup>6</sup> between 2013 and 2015. Further process-specific findings based on the sample of 11 countries are listed in Table 2.

In terms of differences between survey coordination and implementation in WCA and ESA, NNS in WCA are conducted annually to reach

a consensus on the country’s nutrition situation; these are coordinated and implemented by a technical committee that includes members of government (such as the Ministry of Health (MoH) and the Bureau of Statistics) as well as technical and financial partners (mainly international donors via UN agencies and sometimes governments).

The primary role of the technical committee is to develop and validate the survey protocol, advise on steps to ensure the conduct of a high-quality survey, provide support during the entire training and data collection process (technically and logistically) and validate survey results. Capacity-building of these technical committees started almost a decade ago; for example, in 2009 in Burkina Faso. Since then, the MoH in Burkina Faso committed to strengthening nutrition interventions in health services and in the community within the framework of its 2010-2015 strategic nutrition plan. This included a nutrition situation surveillance mechanism supported by annual NNS conducted since 2009 by the MoH Department of Nutrition, with the process taking on average six months to complete (six weeks for planning and four and a half months for implementation). The regular technical support from UNICEF WCARO<sup>7</sup> and the ongoing capacity-building through regional SMART methodology trainings have ensured a successful institutionalisation of the capacity required to conduct these annual surveys.

In ESA on the other hand, sub-national and smaller-scale SMART surveys are more widely implemented, driven by the emergency monitoring needs in the region. Surveys are coordinated by a Nutrition Information Technical Working Group (NITWG) or equivalent at country level that has a similar composition and responsibilities to the technical committees in WCA.

By 2015, Tanzania was the only country in ESA to implement an NNS using the SMART Methodology. Following a year of coordinated advocacy efforts to the Government and nutrition partners, this first NNS was planned and implemented between July and December 2014. Led by the Ministry of Health and Social Welfare (MoHSW) and the Zanzibar MoH in partnership with key stakeholders, it was conducted in response to the need for an additional source of reliable data between rounds of Demographic and Health Surveys (DHS), which are conducted every four to five years. The purpose was to ensure a closer monitoring of key nutrition indicators required to track progress towards global targets and to inform development of a new National Nutrition Action Plan.

<sup>3</sup> UNICEF West and Central Africa Regional Office (WCARO) and UNICEF Eastern and Southern Africa Regional Office (ESARO).

<sup>4</sup> Case study for Tanzania and Burkina Faso available at <http://smartmethodology.org/about-smart/>

<sup>5</sup> Since 2015 (outside of the time frame for this study) regular surveys using SMART have been carried out in both Malawi and Mozambique at sub-national levels.

<sup>6</sup> Burkina Faso, Chad, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Tanzania

<sup>7</sup> UNICEF West and Central Africa Regional Office.

**Table 3** Cost per strata in different countries in US\$

	Country	Median Cost (US\$)	Comments
NNS	Mali	25,000	Number of strata in surveys and security varied each year
	Senegal	17,200	Only data from 2015
Small-scale surveys	Cameroon	19,000	Not including the cost of recruiting a SMART consultant (\$30,000-\$40,000)
	Kenya	10,500	The cost to conduct a SMART varies according to the size and geographic issues of the counties
	South Sudan	15,000	Costs increased in 2015 due to transportation costs during data collections (i.e. boat and helicopter) as well as the crash in value of the South Sudanese pound
	DRC	11,000	Data from UNICEF DRC. Cost are high for small-scale surveys because central teams travel around the country
	Malawi	19,750	Not including to the cost of recruiting a SMART consultant (about US\$50,000)

To assess cost differences between small-scale and national-level surveys, the overall cost per survey<sup>8</sup> was divided by the total number of strata (each of the smallest non-overlapping sub-groups in which the total population is divided during a survey and for which malnutrition estimates are obtained). This allowed comparison between national (multi-strata) and small scale (single stratum) surveys. The results showed that the average cost per strata in national surveys was US\$21,100, compared to US\$15,050 for small-scale surveys (see Table 3). Insecurity significantly increased survey costs, such as in the regions of Gao and Kidal in Mali. Data on cost were not available for all surveys.

The results of SMART surveys across ESA and WCA are incorporated into various national and regional nutrition information systems and/or EWS, including FEWS NET, Cadre Harmonisé (Harmonised Framework), Integrated food security Phase Classification (IPC) and Nutrition Information in Crisis Situations (NICS).

The regular implementation of NNS has often led to a consensus on the country's nutritional status, making it possible to respond to and evaluate the response to different food and nutrition crises that may have affected the country in recent years, enhance nutrition information and EWS, bolster the position of nutrition within the government, and monitor the progress of global nutrition indicators (including those of the Scaling Up Nutrition (SUN) Movement and the Millennium Development Goals (MDGs)).

In Burkina Faso, for example, an analysis of results incorporated into the National Health Information System from multiple NNS showed a downward trend in the malnutrition rates over the past five years and an improvement in infant and young child feeding (IYCF) indicators since 2012.

### Lessons learned

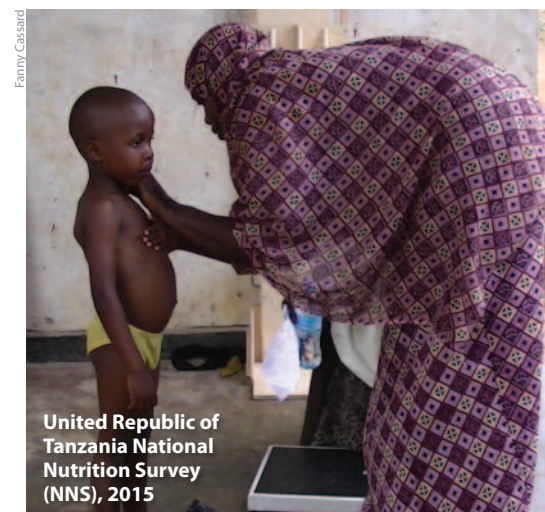
The involvement of the government throughout the different survey phases and its ownership of survey results, the short turnaround time from data collection to reporting (less than four months in the case of Tanzania) and the effective

communication ensured by the established co-ordination mechanisms were identified as key attributes of the added value of NNS. The main driving factor leading to a government's ownership of the survey and its results was the advocacy process using NNS results to plan nutrition programming, especially since the outcomes were considered as benchmarks by the technical and financial partners. For example, the results of the first NNS in Tanzania were used to identify priority regions, improve nutrition programming and prepare the National Multisector Nutrition Action Plan (2016-2021), which aimed to achieve the 2025 World Health Organization (WHO) targets for nutrition. The results of annual NNS conducted by the Government of Burkina Faso were used to regularly update indicators and continuously monitor the country's nutrition situation.

### Recommendations

Several areas for improvement were identified in this review:

- Only two out of the 11 selected countries (Kenya and South Sudan) scheduled regular SMART Survey Manager training sessions. It is advisable to develop a mapping of existing capacities and a training plan to address sustainable capacity-development needs.
- The timing of data collection differed throughout the years in some countries implementing NNS, limiting comparison between years (due to the bias effect of the seasonality of malnutrition). It is recommended that data are collected during the same period (ideally during the "hunger season") to allow for comparison with past surveys and the capability to intervene quickly in case the nutritional situation deteriorates sharply.
- Toolkits guiding the NNS implementation process have been developed in many countries that conduct NNS. There is a need to conduct a comparative assessment of these tools in order to harmonise them and develop a standardised toolbox for the implementation of NNS.
- The frequency and representation of regional and/or small-scale surveys and the cost-benefit and need for data should be care



United Republic of Tanzania National Nutrition Survey (NNS), 2015

fully considered in each country context to reduce associated implementation costs and thereby facilitate the sustainability of the information systems currently in place.

### Limitations and further areas of research

This review faced some limitations, including:

- The purposeful sampling and the small sample size of 11 countries out of a total of 45 sub-Saharan countries might limit the generalisability of results (the sample of countries with different implementation profiles can, however, be considered sufficient to document the SMART implementation process).
- The review focused on the use of SMART surveys and did not look at other forms of nutritional surveillance that may be employed by different countries (this was beyond the scope of the review).
- The SMART survey implementation process and the lessons learnt derived from shared documents and secondary information dating between 2013 and 2015 were described narratively rather than generated using more complex statistical analyses.
- Given that detailed information was not gathered on the profile of existing national nutrition information systems, an analysis of nutrition information systems was not included in this review.

Further areas of research recommended following this review include:

- Large studies with complex analyses are needed to better inform stakeholders on the role that SMART survey results play in national nutrition information systems, nutrition advocacy, policy development and nutrition programming.
- A systematic review of the quality of SMART surveys and lessons learned on how to improve data quality would be useful to inform data-quality improvement efforts for other surveys that collect nutrition indicators.

For more information please contact Mara Nyawo at [mnyawo@unicef.org](mailto:mnyawo@unicef.org)

<sup>8</sup> For the surveys shown in Table 3. Cost data was not available for all surveys.



## Effectiveness of a community-based IYCF support group programme among ethnic minorities in Vietnam



Mother feeding her child with soup after preparing the meal in a group meeting in Thuong Xuan, Thanh Hoa, Vietnam, 2014

Nguyen Ngoc Thach, Save the Children

By Md Masud Rana, Huan Nguyen Van and Thach Nguyen Ngoc



Md Masud Rana is a Nutrition Advisor with Save the Children with a particular focus on supporting nutrition programmes in Asia region. Masud has worked for more

than ten years in the design, delivery and evaluation of nutrition, food security and livelihoods programmes in Asia and Africa.



Huan Nguyen Van is the Health and Nutrition Program Development Manager with Save the Children International in Vietnam. He has an MSc in Project Management and

nearly 10 years' experience in health and nutrition development projects.



Thach Nguyen Ngoc is a Public Health Specialist with a BA in Public Health from Hanoi School of Public Health, Vietnam. He currently works with Save the Children International

in Vietnam as the Health and Nutrition Coordinator of Northern Mountain Integrated Child Nutrition Improvement Project, Vietnam.

The authors acknowledge support from local partners, including Thanh Hoa Department of Health, Thanh Hoa Reproductive Health Centre, Thuong Xuan District Health Centre and four Commune Health Centres (Xuan Loc, Xuan Chinh, Ngoc Phung and Van Xuan) in Thuong Xuan district, Thanh Hoa province, for their support. Special gratitude is offered to mothers and children from Thuong Xuan district, Thanh Hoa province for volunteering to take part in the study, sharing their knowledge on local child-feeding practices and sparing their valuable time. The authors would also like to acknowledge Irish Aid's contribution and their generous support in funding the project and this study, and the support of Save the Children staff in Vietnam.

Location: *Vietnam*

**What we know:** A quarter of children under five years old are stunted in Vietnam; prevalence is higher amongst ethnic minority groups.

**What this article adds:** Community-based infant and young child feeding (IYCF) support groups were established in a remote northern region of Vietnam from 2012 to 2017 to provide breastfeeding support, complementary feeding support and IYCF information to community members. An impact evaluation was carried out in July 2017 using propensity score matching to compare changes in IYCF knowledge and practices and prevalence of stunting in children under two years old between a group that received the intervention (149 households) versus a control group (227 households) from 37 villages. Findings showed some impact on IYCF knowledge (among mothers and caregivers on breastfeeding and complementary feeding practices), but limited impact on practice (significant impact only for minimum dietary diversity and handwashing) and no impact on stunting or acute malnutrition. In future, the authors propose that similar interventions should be informed by barrier analysis; care groups should be delivered at greater intensity; and multiple channels should be used to delivery social and behaviour change communication interventions (including antenatal clinics and health facilities).

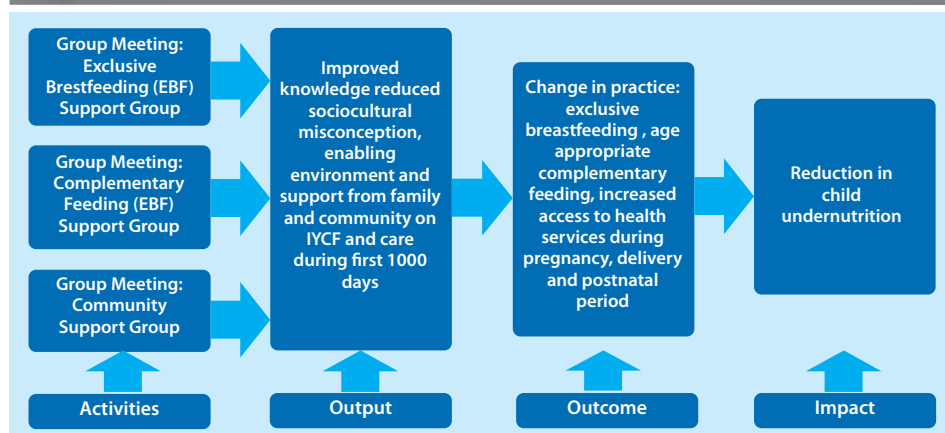
### Background

Despite significant reductions in child malnutrition over the past two decades, a quarter of all children under five years old in Vietnam are stunted. Prevalence is higher among ethnic minority children in the northern mountainous region, where it ranges from 41 to 55%. Research suggests inappropriate infant and young child feeding (IYCF) practices are the key determinants of stunting in Vietnam (Chaparro, Oot & Sethuraman, 2014). As these communities live in remote areas and have limited access to health facilities, Save the Children International in Vietnam (SCiV) and Alive & Thrive jointly designed a community-based IYCF support group intervention as an alternative model using social behaviour change communication

(SBCC). SCiV, with funding from Irish Aid, implemented a project based on this design in Thuong Xuan District, Thanh Hoa province in Northern Vietnam between 2012 and 2016. The project was later extended for one more year and aligned more closely with the Government of Vietnam's poverty alleviation programme for ethnic minorities.

The IYCF support group model (described in Figure 1) is based on three types of support groups facilitated by trained staff, including a monthly breastfeeding group for pregnant women and mothers with infants aged 0-6 months; a monthly complementary feeding group for mothers and caregivers of children aged 6-24 months; and a community support group for fathers, grandparents and village lead-

**Figure 1** Simplified theory of change for the community-based IYCF support group model



ers. Information about appropriate IYCF practices and to address IYCF misconceptions was delivered through the groups. The purpose of this research was to evaluate the impact of the IYCF support group in improving child-feeding practices and reducing stunting among children under two years old. Based on the theory of change (Figure 1), the study sought to determine whether the intervention significantly changed IYCF practices among the target population and identify the effect of the intervention on stunting among children under two years of age.

**Methods**

A quasi-experimental impact evaluation was undertaken in July 2017 to compare individuals and households with children under two years old who received the intervention (i.e. those

from villages where IYCF support groups were formed and maintained) with those from neighbouring communities with similar background characteristics who did not receive the intervention. Probability-proportionate-to-size (PPS) sampling was used to select both the intervention and control group. A total of 376 households (149 intervention households and 227 comparison households) was surveyed from 37 villages in five communes.

The primary analysis approach for this effectiveness review was propensity score matching (PSM). The matching variables were selected based on two key factors: (i) the variables considered to be most important in influencing ‘project participation’; and (ii) the variables with the potential to affect both the intervention outcome and the like-

lihood of project participation (Caliendo & Kopeinig, 2008). Robustness was tested by estimating outcomes using alternative PSM models and multivariate regression models. More details of the data analysis process and methodological limitations can be found in the full report (Rana, Nguyen Van & Nguyen Ngoc, 2017).

**Key findings**

In the overall sample, 91% of households were male-headed and in 57% of households the primary occupation was farming. One in every five household heads (19%) had no formal education; around 11% had completed primary school; 58% had attained a secondary-level qualification; and one in every 20 household heads was educated beyond this level. Based on the government poverty measurement system, over one third (36%) of households were categorised as ‘poor’ (total income < one million VND/person/month). Around 90% of the intervention and 87% of the comparison mothers gave birth in a health facility during the delivery of their last child. One quarter of all child births were through caesarean section (which reflects national C-section figures) and almost all pregnant women reported visiting the health facility for antenatal care (ANC) services.

*Caregiver’s knowledge on IYCF*

A set of ten questions was developed to assess mothers’ knowledge on breastfeeding (BF) and complementary feeding (CF), which were combined to create a BF knowledge score and a CF knowledge score. As indicated in Table 1, on average mothers from intervention villages scored 6.0 out of 10 on the breastfeeding knowledge scale, compared to an average score of 5.3 among the comparison group. Statistical evidence supporting this difference is weak in the primary analytical model. However, considering the fact that the robustness tests (with alternate models) suggest very strong significance, the project is likely to have had a positive impact on knowledge of breastfeeding (please contact the authors to see the full report).

On average mothers from the intervention villages scored an average of 4.9 out of 10 on the complementary feeding knowledge scale, compared to an average score of 4.3 among the comparison group; this difference was statistically significant (p<0.05).

*Nutrition practices*

Nutrition practices were measured according to WHO-IYCF core indicators (see Figure 2). A statistically significant (p<0.05) positive impact of the intervention was found only on minimum dietary diversity (MDD). On average, 59% of intervention group mothers reported that their child had received food from a minimum of four food groups during the 24 hours preceding the survey, compared to only 39% among the comparison group. This finding is likely to be primarily due to the significant variation in MDD between boys in the intervention (71% and 40% in intervention and control groups respectively), while for girls the difference (46% and 37%) was not found to be statistically significant.

**Table 1** Knowledge of caregivers (mothers) from intervention and comparison households on appropriate IYCF

	Mean Breastfeeding (BF) knowledge score	Answered 50% of BF-related questions correctly (%)	Mean complementary feeding (CF) knowledge score	Answered 50% of CF-related questions correctly (%)
Intervention group	5.986	78.5	4.924	58.3
Comparison group	5.300	66.8	4.320	44.0
Difference	0.655*	10.9	0.626**	15.2**
Standard Error	(0.373)	(8.9)	(0.302)	(7.3)
Observations (intervention group)	144	144	144	144
Observations (total)	366	366	366	366

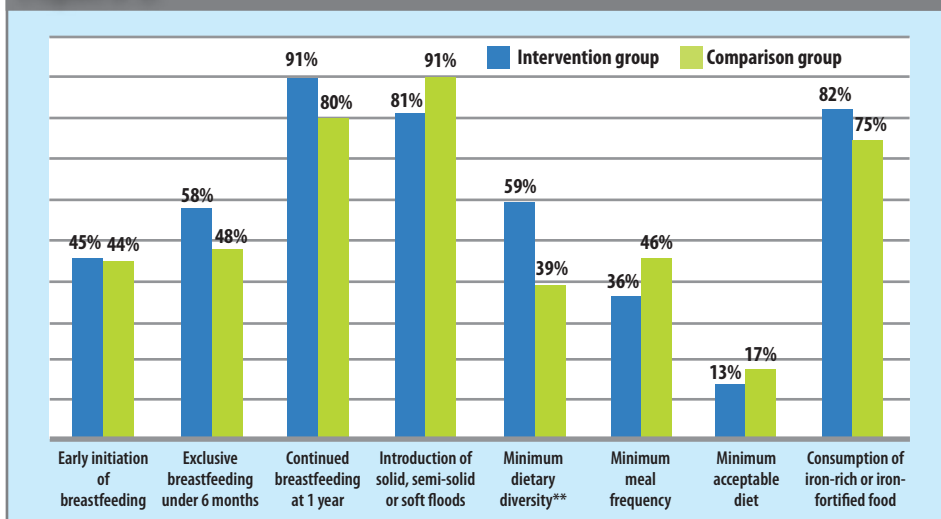
Standard errors clustered at village level in parentheses; \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01; PSM estimates are bootstrapped with 1000 repetitions.

**Table 2** Minimum dietary diversity and consumption of iron-rich/fortified food in intervention and comparison households, disaggregated by sex

	Minimum dietary diversity (%) - Boys	Minimum dietary diversity (%) - Girls	Consumption of iron-rich/fortified food (%) - Boys	Consumption of iron-rich/fortified food (%) - Girls
Intervention group	71.0	46.4	80.6	83.9
Comparison group	40.0	37.2	84.1	63.5
Difference	30.4***	7.1	-4.9	18.0**
Standard Error	(10.3)	(10.0)	(8.5)	(8.5)
Observations (intervention group)	62	56	62	56
Observations (total)	159	135	159	135

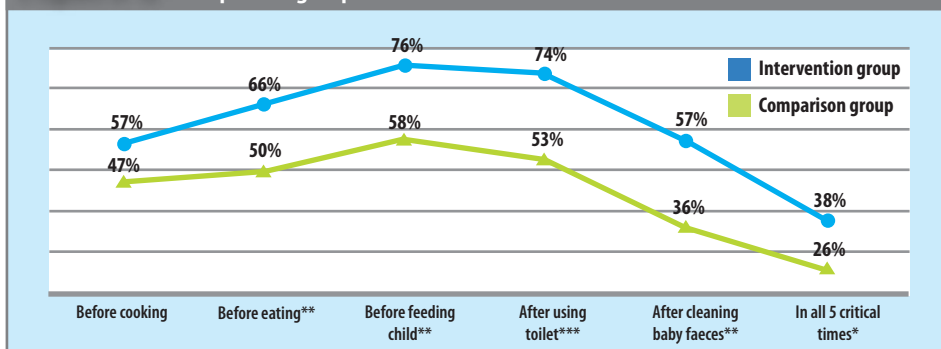
Standard errors clustered at village level in parentheses; \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01; PSM estimates are bootstrapped with 1000 repetitions

**Figure 2** IYCF practices in intervention and comparison households



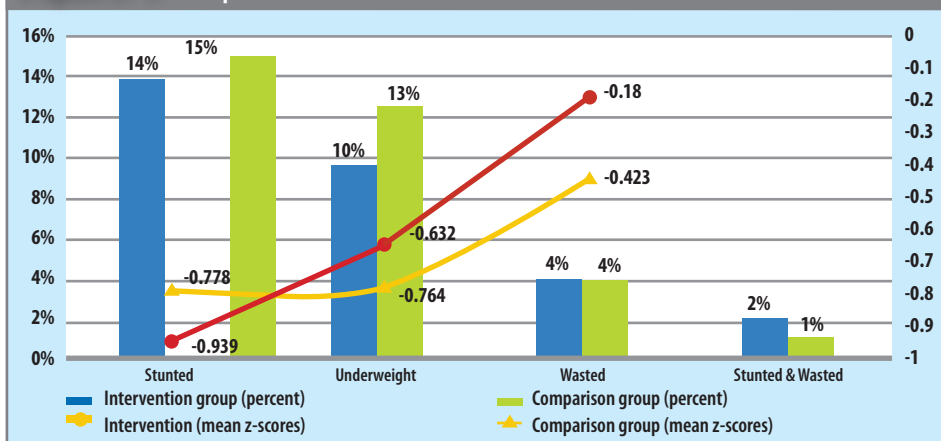
\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

**Figure 3** Reported hand-washing practices by caregivers from intervention and comparison groups



\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

**Figure 4** Mean nutrition status of children < 2 years old from intervention and comparison households



\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

However, the percentage of children receiving a minimum acceptable diet (MAD) was actually higher among comparison group (17%) compared to the intervention group (13%), although the difference was not statistically significant. The evaluation did not find any evidence of impact on the early initiation of breastfeeding and no significant impact on exclusive breastfeeding (24 hour recall). There was strong evidence that the intervention had a positive impact on girls' consumption of iron-rich or iron-fortified foods, although the overall im-

pact across both genders was not statistically significant (Table 2).

**Handwashing**

As messages relating to personal hygiene and appropriate hand-washing practices were an integral part of the SBCC module, the effect of the intervention on these practices was also evaluated. Results show that the intervention had a statistically significant positive impact on reported hand-washing practices. Overall, 38% of mothers from intervention villages reported

washing their hands at all five critical times with water and soap, compared to 26% from the comparison group (P<0.1) (Figure 3).

**Child nutritional status**

Anthropometry was used to measure child nutritional status. Anthropometric measurements (i.e. sex, height, weight and date of birth) of an index child<sup>1</sup> were taken from every participating household. No significant difference between children in intervention and comparison households was found in terms of stunting (14% compared to 15%) or underweight (10% compared to 13%), as measured by height-for-age and weight-for-age z-scores respectively (Figure 4). Wasting was found to be lower among intervention group households; however the proportion of children who were stunted and wasted concurrently was slightly higher in the intervention group (2% compared to 1%).

When disaggregated by age group (Table 3), it was observed that the prevalence of malnutrition was higher among older children compared to younger children in both intervention and comparison groups. There was no statistically significant difference between the two groups in terms of any of the types of malnutrition except stunting among children aged 0-5 months; there were no stunted infants in the intervention group, compared to 17% in the comparison group.

Prevalence of severe stunting was similar between the two groups (4%), as was severe underweight (1%) and overweight (1%). Nearly 2% of children in the intervention group children were severely wasted, compared to less than 1% of children in the comparison group.

**Programme learning consideration**

*Establish multiple channels for information dissemination:* Despite increases in knowledge, the change in IYCF practices was minimal. Future programme designs should consider multiple contact points for information sharing in addition to regular group meetings and group counselling. Nutrition counselling could also be delivered during ANC check-ups, given the good availability and access of ANC at commune and district levels. Individual counselling could also be provided through home visits, depending on the context and resource availability.

*Design the intervention based on analysis of existing barriers to behaviour change:* The messages and intervention activities should address not only knowledge but context-specific barriers to adopting recommended behaviours, which should be determined through barrier analysis. The findings of this analysis should be used to develop a project-specific behaviour change framework.

*Improve efficiency of programme implementation:* Improvement in IYCF practice was found only for MDD among boys, consumption of iron-rich or iron-fortified food among girls, and caregiver handwashing at critical times.

<sup>1</sup> 'Index Child' was the youngest child of the household, who was also under 24 months old at the time of the survey.

**Table 3** Nutrition status of children < 2 years old from intervention and comparison households disaggregated by age-groups

		Age group			
		0-5 months	6-11 months	12-17 months	18-23 months
Stunted (%)	Intervention	0	16	17	18
	Comparison	17***	10	29	12
Underweight (%)	Intervention	4	5	11	16
	Comparison	14	9	13	17
Wasted (%)	Intervention	4	3	3	7
	Comparison	3	3	6	5
Stunted & Wasted (%)	Intervention	0	0	3	5
	Comparison	0	1	5	0
Observations (n)	Intervention	26	38	36	44
	Comparison	72	114	81	98

\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

There was no evidence that the intervention positively affected child nutrition status. While there could be many different factors contributing to the lack of positive impact, efficiency of programme implementation is likely an important one. During 2017, only 45.5% of intended group meetings took place (518 out of a target of 1,140 meetings across 38 villages, with 30 meetings/village). To address this, frontline staff must strictly adhere to the implementation plan, which stipulates monthly group meetings on BF and CF and bi-monthly community group meetings.

Future projects should work closely with the Department of Health, Provincial and District People’s Committees, the central and local level Women’s Union and other government agen-

cies to ensure the adherence to the implementation plan.

*Conduct a gender-context analysis during future programme design phase:* This review has found that, even at end-line, there was disparity between boys and girls with regard to some of the outcome-level nutrition practice indicators. This indicates that gender may influence child-feeding decisions. It was beyond the scope of this study to explore this fully, but future interventions and activities should be designed in light of a gender-context analysis.

**Conclusions**

Review of this project demonstrates the potential but also the programming and likely social and economic complexities behind delivery of

an effective, community-based IYCF support group model. The intervention impacted IYCF knowledge but had limited impact on practice and no impact on stunting or acute malnutrition. Future community-based IYCF support group interventions should be informed by barrier analysis, delivered at the intensity stipulated in the intervention plan, and use multiple channels for the delivery of SBCC activities. Given the high attendance at ANC and facility delivery (with significant C-section rate) in this population, engaging health facility staff in interventions to influence early breastfeeding practices is necessary. The programme should also be complemented by other poverty-reduction and food-security interventions to enable participants to practice recommended behaviours.

For more information, please contact Md Masud Rana at [M.Rana@savethechildren.org.uk](mailto:M.Rana@savethechildren.org.uk)

**References**

Caliendo M & Kopeinig S. (2008). *Some Practical Guidance for the Implementation of Propensity Score Matching*. Journal of Economic Surveys, Wiley Blackwell, vol. 22(1), pages 31–72. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-6419.2007.00527.x>epdf

Chaparro C, Oot L & Sethuraman K. (2014). *Vietnam Nutrition Profile*. Washington, DC: FHI 360/FANTA. Retrieved from [www.fantaproject.org/sites/default/files/download/Vietnam-Nutrition-Profile-Apr2014.pdf](http://www.fantaproject.org/sites/default/files/download/Vietnam-Nutrition-Profile-Apr2014.pdf) (Accessed 9 July 2018).

Rana M, Nguyen Van H & Nguyen Ngoc T. (2017). *Effectiveness of community-based infant and young child (IYCF) support group model in reducing child undernutrition among ethnic minorities in Vietnam*. Hanoi, Vietnam: Save the Children.



Nguyen Ngoc Thach, Save the Children



South Sudan representatives at the SUN Global Gathering in Abidjan, November 2017

## Scaling Up Nutrition (SUN) in Protracted Crisis: The South Sudan Civil Society Alliance (CSA) experience

By Mercy Laker, Dr Soma Emmanuel and Joseph Scott



Mercy Laker is Assistant Country Director for CARE South Sudan. Prior to this she served as the Health and Nutrition Coordinator for CARE, when she played a central role in activating the South Sudan SUN Civil Society Alliance. Mercy is a

public health nutritionist with 14 years' hands-on experience in nutrition programming in both emergency and development contexts at various levels.



Dr Soma Emmanuel has worked with CARE South Sudan since 2017 as Country Health Manager. His contributions in coordinating the implementation of SUN Civil Society Alliance activities among member agencies have been crucial in

ensuring that the Alliance remains coherent.



Joseph Scott is a Communication and Policy Coordinator for CARE South Sudan. He is a communication specialist with ten years' experience delivering communications and advocacy strategies for donors, the United Nations, leading non-

governmental organisations and development contractors.

The authors would like to acknowledge the support and involvement of the Ministry of Health South Sudan, UNICEF South Sudan, World Food Programme South Sudan, the South Sudan SUN CSA and the SUN CSA Global Secretariat.

Location: *South Sudan*

**What we know:** Nutrition programming in South Sudan is dominated by treatment of acute malnutrition.

**What this article adds:** South Sudan officially joined the global Scaling Up Nutrition (SUN) Movement in 2013; armed conflict delayed launch until 2016. In 2017 CARE mobilised civil society organisations (CSOs) to form the South Sudan SUN Civil Society Alliance (SUN CSA). It aimed to promote integration of sustainable nutrition-sensitive interventions within the protracted crisis, amplify CSO voices and raise the profile of nutrition among multiple stakeholders. Immediate activities included awareness raising and development of a Terms of Reference and structure. It currently comprises 35 members, with sub-national expansion of coordination, prioritising high-burden counties. The nutrition cluster has played a pivotal role in bringing civil society actors to the table. Challenges include lack of a nutrition policy framework and infrastructure with which to align long-term, nutrition-sensitive interventions; programmes are typically guided by short-term humanitarian response plans with short funding cycles. The South Sudan SUN CSA remains at inception phase, mainly due to limited financial and human resources, and is dependent on individual rather than agency-level commitment. The Nutrition Cluster has helped create a favorable perception of multi-sector, nutrition-sensitive interventions in an emergency context. Next steps include advocacy for development of a South Sudan Nutrition Action plan and M&E plan, scale-up of the SN SCA strategy, strengthening gender mainstreaming in nutrition interventions, and joint resource mobilisation. Moving towards preventive programming is possible in protracted crisis, but requires deliberate action.

### Background

Nutrition programming in South Sudan is strongly skewed towards treatment of acute malnutrition. Donors are largely unwilling to fund interventions to prevent malnutrition through multi-sector, nutrition-sensitive programming due in large measure to the time required to achieve results. South Sudan officially joined the global Scaling Up Nutrition (SUN) Movement in 2013 following a letter of commitment from the Government. However, due to armed conflict that broke out in December 2013, the SUN Movement was not launched in South Sudan until 2016. After its launch, the United Nations SUN Network and Steering Committee were formed. The Steering Committee at the time consisted of representation from the World Food Programme (WFP), UNICEF and the Ministry of Health (MoH). The Under Secretary of the MoH acts as the Country convenor and SUN Focal Point. At the time, most of the emergency-focused civil society organisations (CSOs) in South Sudan had little connection or knowledge of the SUN Movement.

The causes of malnutrition in South Sudan are broad and complex. The SUN

Movement provides a suitable platform for the promotion of a multi-sector and multi-disciplinary approach to address undernutrition, involving nutrition actors from a wide range of fields and not just those focused on the community-based management of acute malnutrition (CMAM). The eventual launch of SUN in South Sudan occurred at the same time as the inter-cluster working group (ICWG) was promoting an integrated package of interventions, including Water, sanitation and hygiene (WASH), Health, Nutrition and Food Security, and Livelihoods (FSL), jointly developed by the respective Clusters. Recognising the goodwill of the Government and UN towards the SUN Movement and the strength of South Sudan's civil society, in October 2017, following the approval of the Government of South Sudan and the South Sudan SUN steering committee, CARE began mobilising CSOs to form the South Sudan SUN Civil Society Alliance (SUN CSA).

### The CSA formation process

CARE reached out to the Government through a letter notifying the MoH of the intention to form and lead the SUN CSA. CARE's motivation was to arouse interest

**Table 1** Roles and responsibilities of partners in the SUN CSA Consortium

Organisation name	Responsibilities of partner
CARE South Sudan	Lead and coordinate activities; act as the fiscal agent and manage grant funds; facilitate cross-learning among consortium members; champion gender mainstreaming; conduct a gender analysis.
Save the Children	Lead in mobilising SUN CSA members to work with parliamentarians to raise awareness of nutrition in South Sudan.
Action Against Hunger (ACF)	Lead in mobilising SUN CSA members to work with nutrition champions and strengthen grassroots advocacy initiatives for prioritisation of nutrition-sensitive interventions in planning, budgeting and implementation of projects and policies.
Christian Aid	Lead on the development of the SUN CSA monitoring and evaluation (M&E) framework and enable cross-agency learning among consortium partners and SUN CSA members.
South Sudan Women's Network for Development	Lead on training of local and marginalised organisations with support from Action Against Hunger to promote gender inclusion in nutrition.
SUN CSA members	Co-fund and participate in implementation of activities.

among CSOs in South Sudan to promote integration of nutrition-sensitive interventions within the ongoing protracted crisis for sustainability. The SUN CSA would further provide a suitable platform to amalgamate and amplify CSO voices alongside the UN and government networks and profile nutrition as everybody's business, rallying commitment from government, donors, academia, private sector and other CSOs to the cause. CARE was invited to make a presentation before the SUN Steering Committee to gain its approval, alongside two other organisations who had also expressed interest in leading the Alliance. After the presentations the Committee endorsed CARE's leadership of the Alliance. Save the Children was assigned to co-Chair and Christian Aid became Secretary to the Alliance, together making up the South Sudan SUN CSA Secretariat. CARE then developed an annual work plan and budget and outlined the intention for SUN CSA. The activities and strategies were to be jointly defined and co-funded by members of the alliance to promote ownership and sustainability.

Recognising the need for endorsement from a broader range of agencies, the SUN CSA Secretariat began mobilising other non-governmental organisations (NGOs) to register. Several other

agencies subsequently joined the SUN CSA and these agencies (World Vision International, Catholic Relief Services (CRS) South Sudan, Women's Network for Development and Nile Hope), together with the Secretariat, formed the South Sudan SUN Executive Committee (EC). This formally set in motion the activities of the South Sudan SUN CSA in November 2017. The EC proceeded to adopt Terms of Reference (ToR) that set out the roles of the Chair, co-Chair and Secretary, common purpose and collective responsibilities of the secretariat, EC and SUN CSA membership. The SUN CSA TOR set out to achieve a South Sudan free of hunger and malnutrition by 2030. The EC capped the Secretariat term at two years, after which SUN CSA members would select new leadership by vote at an annual general meeting.

Led by CARE, the EC embarked on a process of awareness-raising of the SUN CSA, primarily by making presentations at Health, FSL and Nutrition Cluster meetings and circulating registration forms. It was a requirement that the registration form be signed at the highest level within each agency. Thereafter, organisations were requested to submit their profiles to the Secretariat for filing. These documents were also shared with the MoH.

The SUN CSA Secretariat met weekly during the set-up process to develop the structure and TOR and assess registrations for membership, which was also shared with wider members. A three-day workshop was held between 29 and 31 January 2018 to develop a strategic plan for 2018-2020, including annual activities and budgets. The overall strategic goal was to increase government, donor and CSO commitment to prioritise nutrition as a core sector and as an indicator of development. Specific objectives of the strategy are: (1) Partnership with academia nutrition research, policy influence and advocacy with South Sudan legislators, planning authority and donor community; (2) Nutrition awareness-creation targeting communities, private sector and legislators; and (3) Capacity-building of government and civil society, including grass root organisations.

In December 2017 CARE engaged a temporary SUN Coordinator for two months to kickstart activities. The funding for this came from a supplementary grant from the French Ministry of Foreign Affairs (MoFA), used as last resort financing by CARE.

### South Sudan SUN CSA current role and activities

The SUN CSA is currently comprised of 35 members, including international and national CSOs, and continues to be governed by the same Secretariat and EC, as described above. The SUN CSA has begun to act on its strategy through co-funded advocacy and awareness-creation activities, including one public lecture conducted in partnership with Juba University under the theme Integrating Nutrition into Agriculture Value Chains. This event marked an important step in engaging academia in South Sudan. Similar activities have been planned on a quarterly basis.

The SUN CSA continues to grow its membership and establish coordination mechanisms at the sub-national level, with a focus on high-burden counties, including Warrap, Unity State, Jonglei and Eastern Equatorial State. The SUN CSA has an action plan to cascade SUN activities beyond national level through existing members. For example, CARE will support sub-national scale-up of nutrition in Unity State and Action Against Hunger and World Vision will support scale-up in Warrap, among others. Activities will include awareness-raising of integrated, nutrition-sensitive programming, research and capacity-building of community groups to advocate for funding, and inclusion of nutrition-sensitive interventions using CARE's community score card.

The SUN CSA's prominent role in scaling up nutrition was highlighted by its participation in the 2017 SUN global gathering in Abidjan, East Africa. SUN CSA members, alongside the MoH, Ministry of Agriculture, UNICEF and WFP, profiled South Sudan's successes and challenges in the integration of nutrition-sensitive programming into emergency response, showcasing



South Sudan SUN CSA group discussions on the development of the TOR, Juba, 2018



Participants engaged in a SWOT analysis at the strategy development workshop, Juba, 2018

various publications from South Sudan mostly developed by UN, CSOs and individuals as well as the South Sudan CMAM guidelines and the Maternal Infant and Young Child Nutrition guidelines. At the meeting the South Sudan team also participated in panel discussions on SUN in fragile contexts. The CSA took home many lessons from the meeting. Notable lessons were the use of nutrition champions in Tanzania, engaging parliamentarians in Zambia and the call to stop 'preaching to the choir' and reach out to non-nutritionists.

Members of the CSA (CARE, Save the Children, Action Against Hunger, Christian Aid and Women's Network for Development) recently formed a consortium to submit a funding proposal to the SUN pooled fund, which was eventually funded by the United Nations Office for Project Services (UNOPS). In the consortium each member is assigned an activity to be implemented through the entire SUN CSA membership, as described in Table 1.

## Challenges

The conflict that broke out in 2013 denied the Government of South Sudan the opportunity to implement the country's five-year development plan. As a result, SUN lacks a nutrition policy framework and infrastructure with which to align long-term, nutrition-sensitive interventions. The Republic of South Sudan does not have a multi-sector action plan or a related M&E framework to guide sector-wide implementation and monitoring and the roles of other would-be critical players, such as the private sector, academia and donors in SUN, remain undefined. This limits opportunities for nutrition financing and interventions such as micronutrient fortification, usually led by the private sector. Programmes are mostly guided by the Humanitarian Response Plan (HRP), which follows one-year planning cycles to mitigate risks for implementing partners and donors. Although a few donors, such as the Swiss Development Cooperation, Dutch Relief Alliance and Global Affairs Canada, fund longer-term resilience activities, many prefer short funding cycles aligned to the HRP.

The role of the Nutrition Cluster and technical working groups (TWGs) in managing malnutrition at country level has been critical. The

Cluster's mandate, however, remains narrowly focused on treatment, with limited integration of nutrition-sensitive interventions. The ICWG has recently developed a minimum training and delivery package for integration across Nutrition, Health, WASH and FSL Clusters. However, the impact of such efforts remains to be seen as the work of these Clusters does not always overlap geographically and, due to resource limitations, prioritisation inevitably occurs, leading to trade-offs between integrated programming and treatment of wasting.

A further challenge is the SUN CSA's inability to operate independently from the Government in South Sudan. The SUN CSA was, for instance, required to seek permission from the Government to form and afterwards was obliged to submit all minutes of meetings, TORs and strategy for MoH approval.

Aside from a limited number of women's networks and organisations, there is still limited gender integration/mainstreaming and engagement of women and women-led groups in the implementation of nutrition-sensitive interventions, even though women are central to nutrition at household level.

The progress of the SUN movement in South Sudan has remained intermittent and mostly driven by external consultants. These one-off consultancy assignments have not been owned and coordinated by civil society actors, which limits the sustainability of the initiative.

Despite the progress made, the SUN CSA is still at an inception phase and faces several challenges in establishing a platform and membership at the sub-national level, engaging multi-sector actors and scaling up its activities nationally. This is mainly due to limited financial and human resources. Even where there is commitment to co-fund some of the activities prioritised in the SUN CSA strategy, individual organisations have reported little-to-no funding for nutrition-sensitive interventions due to the emergency nature of their response plans. Nutrition activities in most organisations are currently funded through the South Sudan Humanitarian Fund (SSHF), UNICEF or WFP agreements in 12-month cycles. National NGOs find it particularly challenging to complement

these funds, although joining networks such as the SUN CSA increases their chances of diversifying their funding base.

So far, SUN CSA activities have been concentrated at national level. At the state and sub-national level, scaling up nutrition interventions have not yet taken root, despite the fact that most of the 1,000 plus national and grassroots organisations in South Sudan have no representation at national level. This leaves gaps when it comes to implementing nutrition-sensitive interventions agreed upon in response plans.

Finally, there has been inadequate advocacy to policy-makers – particularly parliamentarians – to prioritise legislation and financing for nutrition. The food and nutrition policy, for instance, is still to be passed in Parliament; hence, there is no legal framework for nutrition activities in the country.

## Enablers

The SUN CSA membership consists of leading nutrition implementing agencies in South Sudan. CARE, for instance, has a global SUN task force, which has provided both technical and financial resources for the South Sudan SUN CSA. The CARE SUN task force support included financing representation at the SUN global gathering, review of the SUN CSA strategy, technical review of the pooled fund proposal and monthly update Skype meetings. In addition the EC, particularly Save the Children and Christian Aid, have technical expertise within South Sudan as well as regional and global resources that have supported the development of a vibrant CSA.

The SUN CSA has maintained close liaison with the global CSA SUN Secretariat, with Skype calls held during the formative stage to provide progress updates, share experiences and explore opportunities for capacity-building and funding. Communication with the SUN Network and Regional CSA was also key in building confidence based on experiences shared from other countries in the region.

The inclusion of NGOs such as Nile Hope, United Nations Industrial Development Organization (UNIDO) and the South Sudan Women's Network for Development within the EC and as members provided diversity and depth to implementation of the SUN CSA strategy, due to their deep understanding of South Sudan. This was also strategic, as a way to build local capacities for civil action and sustainability of SUN interventions, and to align with the 'grand bargain' objectives of localising aid.

Members of the SUN CSA were directly involved in developing the three-year strategy, including conducting a strengths, weaknesses, opportunities and threats (SWOT) analysis and using the fish-bone problem analysis tool to identify and prioritise activities, based on collective strength and available opportunities. This exercise resulted in joint ownership and, to some extent, co-funding of agreed activities.

In developing the SUN CSA strategy, flexibility was applied to include a mix of activities that members already had funding for and those that the Alliance believed were essential for jump-starting the strategy. The joint SUN activities, including the presentations made at Cluster meetings, SUN planning meetings and public lectures, were 'quick wins' that attracted more members and garnered support for the SUN movement. Utilisation of existing platforms, particularly the various Clusters, was important as Clusters are generally accepted as the coordination mechanism for humanitarian interventions in South Sudan. The Nutrition Cluster was particularly supportive in providing a platform for the sensitisation of CSOs and coordinating registration and other SUN CSA activities.

In forming the CSA, the UN SUN network and the Government were initially supportive through the selection of capable leadership, and later by participating in the development of the strategy and advocacy materials. Under the current partnership cooperation agreement with UNICEF, one activity is being funded on SUN awareness-creation, conducted during World Breastfeeding Week in August 2018. CARE is planning to utilise this funding to create awareness among the private sector.

The timing of the SUN CSA formation, coinciding with the ICWG integration processes, enabled the different Clusters to come together for better integration and deeper impact. This provided an additional platform for members to advocate for a multi-sector approach to address the root causes of malnutrition.

The selection of the SUN leadership by a pre-existing steering committee through a competitive process was a precursor to the successful mobilisation of members. The process gave credibility to the Secretariat, since prospective SUN CSA members believed in the transparency of the selection process. The validation exercise with members that followed was equally critical as it promoted ownership and generated commitment and loyalty; critical to the sustainability of the Alliance. Up to 43 members participated and remained engaged throughout the intense strategy development workshop, while 231 individuals attended the public lecture on integrating nutrition into agriculture value chains. Resolutions from the public lecture included:

1. The need to jointly advocate for funding for nutrition research at Juba University;
2. South Sudan SUN CSA to advocate for incorporation of nutrition education into the curriculum of health courses; and
3. To jointly engage businesses to exercise their social responsibilities by funding nutrition awareness.

### Lessons learned

In protracted crises such as in South Sudan, where the nutrition sector still requires external support, it is essential for the Cluster to adopt a needs-based approach to address gaps that may span beyond treatment of acute malnutrition

only to multi-sector, nutrition-sensitive interventions. In South Sudan the Nutrition Cluster not only played a central role in mobilising CSOs for SUN, but was at the forefront of defining the minimum package for implementing partners beyond CMAM only. The Cluster was an important player in creating a favourable perception of multi-sector, nutrition-sensitive interventions in an emergency context.

Although the use of consultants to develop strategies is a common tendency, the involvement of members in the problem analysis and prioritisation of interventions provided a learning experience for many members and resulted in more ownership of the document and agreed activities. This was demonstrated through willingness of SUN CSA members to coordinate implementation and even co-fund certain activities through existing budgets, such as the strategy workshop and public lecture. The participation of UNICEF and the Nutrition Cluster, albeit only as observers, added credibility to the process, which was critical in South Sudan, where nutrition activities are largely Cluster-led.

Levels of engagements of member organisations depended heavily on the individuals representing them. For instance, four organisations that were initially very active and supportive eventually became disengaged when their technical staff changed.

Leadership of the SUN CSA was built on mutual respect and the understanding that each member brings unique experience and skillsets to the Alliance. For example, international NGOs such as CARE and CRS have access to information and expertise, including emerging evidence and research in nutrition, while national NGOs such as The Health Support Organization (THESO) are more aware of the South Sudanese context.

### Next steps for the CSA

1. Support inclusion of advocacy in the Cluster response plan;

2. Advocate for financing and development of a South Sudan Nutrition Action plan and M&E plan;
3. Scale up implementation of the SUN CSA strategy, including advocacy initiatives, research, awareness creation and capacity-building;
4. Strengthen gender mainstreaming in nutrition interventions, including through support to marginalised women and women-led groups in South Sudan;
5. Involve the corporate and private sector in implementing, funding and promoting nutrition interventions; for instance, messaging through mobile networks and electronic media; and
6. Participate in joint resource-mobilisation initiatives.

### Conclusions

The South Sudan experience shows that even in protracted crisis situations it is possible for agencies to make a deliberate shift towards longer-term, preventive programming. Opportunities need to be deliberately created to strengthen the human development nexus. More importantly, this experience shows that it is possible to be far more inclusive by joining efforts and resources. The following are key take-home messages:

1. It is possible to scale up nutrition prevention interventions even in emergency settings, provided there is commitment from all stakeholders;
2. In emergency settings where the nutrition sector may be weak, the role of the Cluster is critical and may extend beyond current mandates;
3. Though often underplayed, involvement of local CSOs – especially women and women-led groups – may result in an exponential increase in ownership.

For more information, please contact Mercy Laker at [mercyl25@yahoo.com](mailto:mercyl25@yahoo.com)



South Sudan representatives at the SUN Global Gathering in Abidjan, November 2017



# Screening for maternal and child malnutrition using sentinel-based national nutrition surveillance in Afghanistan

By **Admire Chinjekure**, **Dr Mohammad Qasem Shams**, **Dr Abdul Baseer Qureshi**, **Dr Shafiqullah Safi** and **Dr Noor Rahman Noor**



Admire Chinjekure is the Technical Officer and Team Leader Nutrition for the World Health Organization (WHO) Afghanistan. He is a nutritionist with an MSc in Public Health from the London School of Hygiene and Tropical Medicine (LSHTM) and has over 12 years'

experience in nutrition, health and monitoring and evaluation in Afghanistan and Zimbabwe.



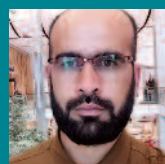
Dr Mohammed Qasem Shams is the National Professional Officer Nutrition for WHO Afghanistan. He is a medical doctor with a post-graduate diploma in Public Health Nutrition and has over 15 years' experience in nutrition programming, including setting up

routine nutrition surveillance systems in Afghanistan.



Dr Abdul Baseer Qureshi is the Technical Officer Nutrition for WHO Afghanistan. He is a medical doctor with over five years' experience in nutrition coordination and setting up routine nutrition surveillance systems in Afghanistan, having previously been the

National Coordinator for the Afghanistan National Nutrition Surveillance Department.



Dr Shafiqullah Safi is the Focal Point for the Integrated Management of Acute Malnutrition (IMAM) supply and emergency in the Public Nutrition Directorate of the Ministry of Public Health (MoPH) Afghanistan. He is a medical doctor with a post-graduate

diploma in nutrition and has over nine years' experience in public health and nutrition in Afghanistan.



Dr Noor Rahman Noor is National Coordinator for the Afghanistan National Nutrition Surveillance Department in the Public Nutrition Directorate of the MoPH Afghanistan. He is a medical doctor with a post-graduate diploma in nutrition and over

five years' experience in nutrition surveillance and IMAM.

The authors would like to acknowledge WHO and UNICEF as the technical partners for the National Nutrition Surveillance Programme in Afghanistan, funded by Global Affairs Canada. They would also like to acknowledge Dr Homayoun Ludin, the Acting Director of the Public Nutrition Directorate of the MoPH Afghanistan, who provided strategic leadership for the Nutrition Surveillance Programme.



Health worker plotting anthropometric indicators on a child health card, Herat Province, Afghanistan, June 2016

## Location: *Afghanistan*

**What we know:** Nutrition surveillance is an important strategy for measuring trends in undernutrition to determine nutrition response and to act as an early warning system (EWS).

**What this article adds:** A health facility-based nutrition surveillance system (sentinel) was developed in Afghanistan by the Ministry of Public Health (MoPH), supported by the World Health Organization and UNICEF to monitor nutrition trends and serve as an EWS. Data are collected from 175 health facility sites and 868 community sentinel sites, selected by convenience from all 34 provinces. Anthropometric, birth outcomes, infant and young child feeding (IYCF) practices and maternal haemoglobin (Hb) data are collected from a random sample of children under two years of age/mothers as they visit health facilities at different levels. Facilities are provided with training, equipment, reporting forms and supportive supervision. Results show an increase in the number of children screened from 2015 to 2017. Acute malnutrition is prevalent among children under two years old, as is maternal malnutrition (30% with low Hb levels). Although largely similar, there was a decreasing trend of GAM and SAM at community compared to health facility sites (2016 to 2017). Lessons learned include the following: it takes time to develop a fully functional nutrition information system (five years in this case); fewer indicators are better to preserve data quality; several IYCF indicators are not feasible to collect in routine services; health facilities should be well connected with community sites to facilitate monitoring; exhaustive monitoring may be preferable to a sample to avoid bias. Steps are being taken to now integrate feasible nutrition indicators into the HMIS system, complemented by the sentinel system for detailed indicator collection.

## Background

The national nutrition surveillance system (NNSS) of Afghanistan consists of surveys (national nutrition surveys (NNS); demographic and health surveys (DHS); Afghanistan household surveys (AHS); SMART surveys; and localised surveys) and the Health Management Information System (HMIS). Since 2013, the World Health Organization (WHO) and UNICEF, funded by Global Affairs Canada (GAC), have jointly supported the Ministry of Public Health (MoPH) Public Nutrition Directorate (PND) in establishing a health facility-based nutrition surveillance (sentinel) system, complemented by community-based surveillance data, to address the lack of a nutrition early warning system (EWS) and limited collection of nutrition data by the HMIS. This article shares lessons learned in the development of a nutrition surveillance system in an emergency context where data needs are high due to the dynamic nature of the humanitarian situation and the requirement of near-to-real-time modelling of vulnerability to target interventions to those in most need.

## Objectives

The primary objective of the intervention was to monitor nutrition trends in the country to serve as an EWS. Specifically, the system was established to collect

**Table 1** Indicators collected through the sentinel nutrition surveillance system

Level of health system	Indicators collected
Health facility level	1. Wasting (weight for height and mid-upper arm circumference (MUAC) and oedema) 2. Stunting (height-for-age) 3. Underweight (weight-for-age) 4. Birth outcomes (low birth weight, neural tube defects) 5. Haemoglobin (Hb) status in pregnant women (indicator for anaemia) 6. Infant and young child feeding (IYCF) practices (early initiation of breast feeding, exclusive breastfeeding, appropriate introduction of complementary feeding)
Community level (health posts)	1. Wasting (MUAC and oedema) 2. IYCF practices (Early initiation and continuation of breastfeeding)

information on child anthropometry, infant and young child feeding (IYCF) and maternal nutrition status through the existing health system, to understand the nutrition trends in the country and to provide early warning on any potential malnutrition problems requiring action. Ultimately, the intervention intends to contribute towards mothers and children receiving essential nutrition services that contribute to improvement of nutrition status.

**Methods**

*Coverage of the sentinel nutrition surveillance system*

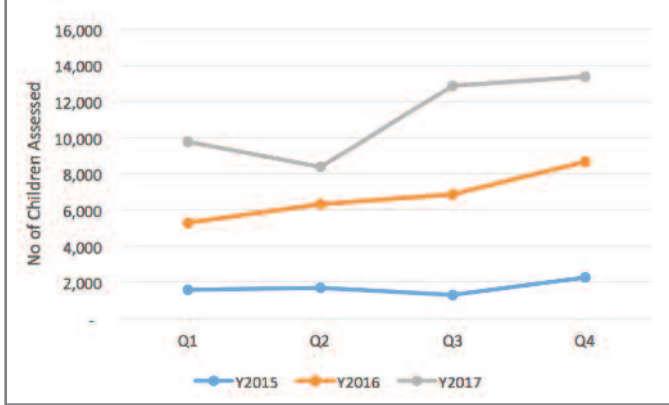
The sentinel site system consists of two levels: (i) health facility sites (n = 175); and (ii) community sentinel sites (n = 868). Sites were selected by convenience in all 34 provinces through participatory involvement of key stakeholders. Accessibility was a key consideration due to insecurity risks, although whenever possible hard-to-reach areas were considered for inclusion. Health facilities in Afghanistan consist (in ascending order) of: health posts (community level), sub-health centres, basic health centres, comprehensive health centers, district hospitals and provincial hospitals. The total number of health facilities in the country is approximately 2,865. There are 15,855 active health posts. Maternity services are provided in all health facilities except health posts; currently 1,454 facilities provide maternity services.

Under the sentinel system, anthropometric data are collected from a random sample of children under two years old as they visit health facilities (basic healthcare, comprehensive, district and provincial facilities). Every third child is selected until a target sample (minimum 150 per quarter per health facility) is reached, and then assessed against anthropometric indices. For maternal indicators, a random sample of pregnant women visiting the particular health facility for the first time (first ANC contact) in the current pregnancy have blood samples taken and Hb measured; four to five mothers are selected randomly per day. Table 1 describes the nutrition indicators collected in the sample population. Emergency nutrition assessment (ENA) software is used to analyse anthropometric indicators against indices. Data are collected daily until targets are reached, after which they are sent for data entry on a monthly basis. Reporting is conducted quarterly.

*Investment at sentinel sites*

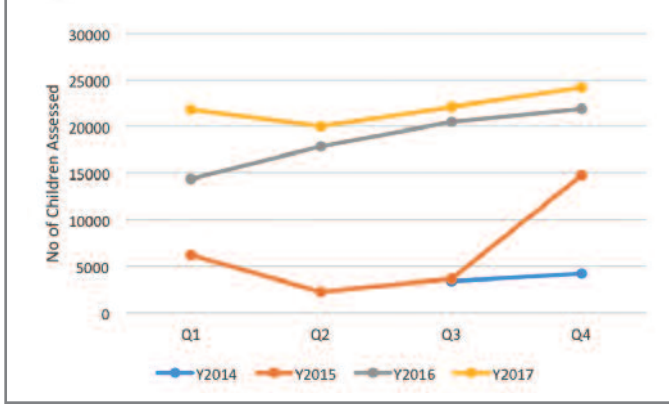
Before starting data collection, training on surveillance principles and techniques is conducted for facility personnel. A two-day training detailing the principles of growth assessment, surveillance and reporting is conducted for health workers from each site. Training is more detailed for workers from health facilities as they conduct more in-depth assessments, while community health workers (CHWs) develop more basic skills in measuring mid-upper arm circumference (MUAC) and interpreting results. Health facilities are provided with equipment for conducting the assessments (scales, height boards and hemoCues for Hb measurement) as well as reporting forms while community sites receive MUAC tapes and registers. The reporting forms were developed from existing mother and child health registers, modified to collect additional nutrition surveillance data. Regular

**Figure 1** Total number of children screened using MUAC at community sites 2015-2017



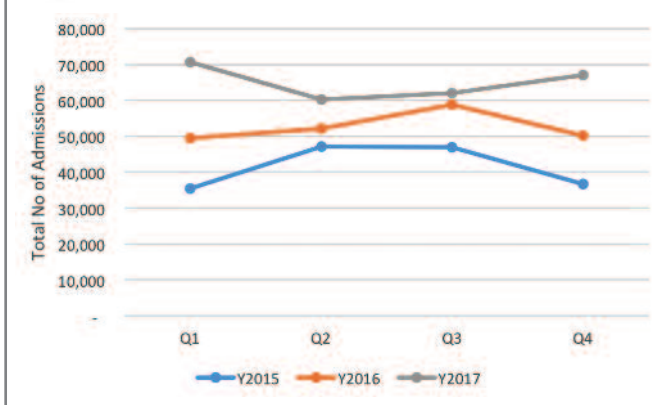
(Source: HMIS)

**Figure 2** Total number of children assessed at health facility sentinel sites 2014-2017



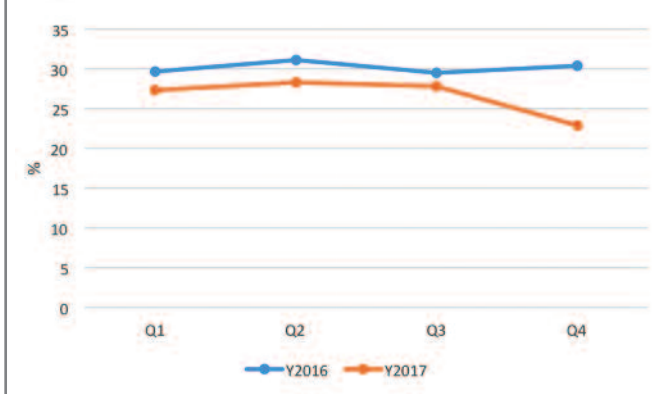
(Source: HMIS)

**Figure 3** HMIS SAM inpatient admissions data 2015-17



(Source: HMIS)

**Figure 4** National community global acute malnutrition (GAM) trends 2016-2017



(Source: HMIS)

support visits and on-the-job mentoring is provided by WHO-recruited field officers and government-recruited nutrition officers. Replenishing of surveillance equipment and registers is initially done through project funds and then gradually taken up by the respective implementers of the health services across the sentinel sites.

### Results

Although there is a need to continually improve the quality of data, the nutrition surveillance intervention has served as an entry point to strengthen growth monitoring and promotion as one of the main preventive strategies, as well as enable early case identification of severe acute malnutrition cases. As shown in Figures 1 and 2, the number of children screened has gradually increased and it is at this screening contact that growth monitoring and promotion services are likely to be provided by the health worker. The growth monitoring and promotion in the health facility sentinel sites are comparatively better than other health facilities not selected as sentinel sites. This is explained by the increased in-service trainings at sentinel sites, as well as more refresher trainings, on-the-job trainings, supervision and monitoring, which in turn increased screening both at health facility and community levels. This improves the quality of data collection, allowing better detection of malnourished children.

#### Community and facility-level screening

In 2017 an average of 11,095 children per quarter from 868 community health posts were screened, an increase from 6,789 (Y2016) and 1,710 (Y2015). There was a lower number of reporting community sites (540) in the initial phase of implementation (2015-16); uptake was a little slower in the community compared to the health facility sites.

Numbers screened at health facility sites average 22,050 children per quarter from 175 health facilities in 2017, up from 18,649 in 2016, 6,718 in 2015 and 3,784 in 2014. Higher numbers of children screened at health facilities is expected, given this comprises children visiting the health facility directly as well as referrals from community, sometimes from beyond the geographical catchment of the health facility. The increasing numbers observed also reflects the phased approach in the scale-up process; ten provinces in 2014, 22 in 2015 and by 2016 all 34 provinces were on board. An analysis of SAM inpatient data (complicated cases) from the HMIS System (HMIS-DHIS2) shows a general increase in the number of admissions across the years (Figure 3). However, a mixed picture was observed whereby in 2015 the highest admissions were reported in Q2; for 2016 it was in Q3, whereas in 2017 the highest admissions were reported in Q1.

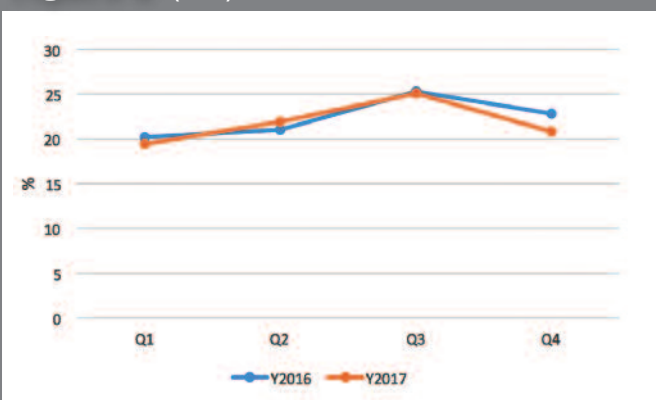
General high levels of acute malnutrition are being observed in children under two years old in the community as reported by the community sentinel sites, consistent with the protracted emergency situation in Afghanistan (Figure 4). A significant proportion of acute malnutrition cases are identified at community surveillance sites using MUAC; complicated cases are referred to the health facilities for further assessment and management as per IMAM protocol. At community level, CHWs are equipped with basic skills to provide nutrition promotional messages, including messages on optimal infant feeding.

Similar to the trends observed at community level, general high levels of acute malnutrition were observed in children under two years old at facility-level sentinel sites (Figure 5). Cyclical trends are emerging in which high levels of acute malnutrition are observed during Q3 and lowest levels in Q1. 2017 had slightly lower levels of malnutrition. The reasons that caregivers and children visit facilities (and are then screened) are varied, including visits for treatment of sickness, vaccinations, growth monitoring and promotion, antenatal care and contraception. Children screened are therefore random, with a possibility of unmeasured bias towards sick baby visits.

SAM prevalence at community level was generally lower in 2017 compared to 2016 (Figure 6). The peak of SAM in 2017 was reported in Q3, while the peak for 2016 was reported in Q2. With increased training and monitoring, CHWs are identifying acute malnutrition cases for management before they deteriorate into serious conditions.

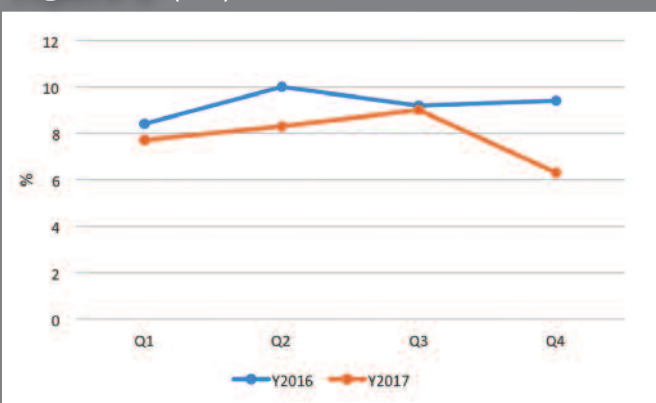
SAM cases were somewhat higher at health facilities in 2017 compared to 2016. In both years the peak was reported in Q3, while lowest levels

**Figure 5** National health facility global acute malnutrition (GAM) trends 2016-2017



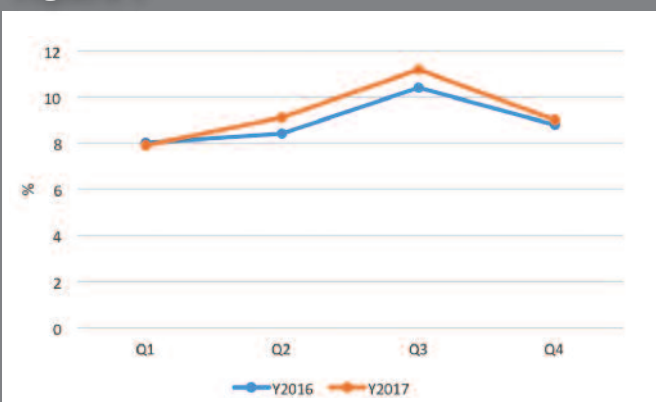
(Source: HMIS)

**Figure 6** National community severe acute malnutrition (SAM) trends 2016-2017



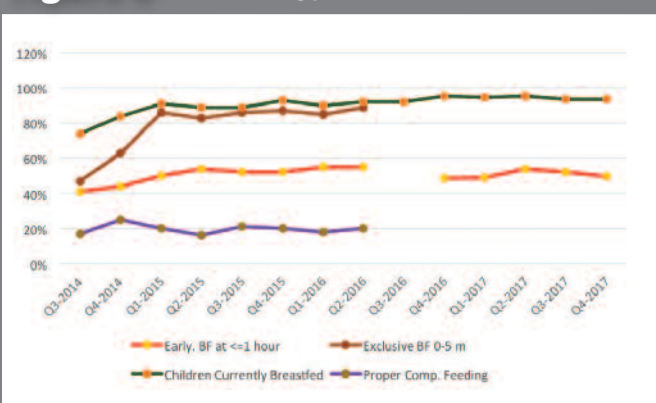
(Source: HMIS)

**Figure 7** National health facility severe acute malnutrition (SAM) trends 2016-2017



(Source: HMIS)

**Figure 8** Infant feeding practices 2014-2017



(Source: HMIS)

were reported in Q1. Assessments and interventions at health facilities are much more detailed; hence more at-risk and malnourished children are identified here and provided with the intervention or referred for further management whenever the health facility does not provide services such as inpatient management. There is an expected bias of likelihood of sicker children presenting at the hospitals and hence elevated proportions of acute malnutrition.

### Infant and young child feeding (IYCF) practices

Comprehensive IYCF data was collected from 2014 until revisions were made in Q3-2016, when a decision was made to reduce the number of IYCF indicators. Justification for removing two main indicators, exclusive breastfeeding and appropriate complementary feeding, was based on lack of reliable data due to the considerable amount of time required to collect the information at a routine health facility. Initially reported rates of exclusive breastfeeding were low (Q1-Q2-2014), rising to above 80% between Q1-2015 and Q2-2016, when data collection stopped. The proportion of appropriate complementary feeding was consistently around 20%. Fairly consistent trends were observed across the reporting period, with most women reporting initiating breastfeeding within the first 24 hours. Marginal fluctuations were observed where, for example in Q4-2017, 49.7% infants were breastfed within one hour of delivery, compared to 52.1% in Q3-2017; otherwise the proportion was consistent from 2016 to 2017. The proportion of infants breastfed in the first hour was low between Q3-2014 and Q1-2015, when a steady rise in the proportion was reported. A total of 93.7% of infants aged under two years were currently breastfed (assessed using the standard WHO definition of continued breastfeeding rate at 20-23 months of age). This has been consistent across the reporting period Q1-2016 to Q4-2017. No data were collected in Q2 and Q3-2016 on early initiation of breastfeeding due to a revision of assessment tools, with resumption in Q4-2016 after consensus was achieved to retain the indicator.

### Maternal health

Hb status was assessed for all pregnant women visiting the respective sentinel sites that provided maternity services. It has been observed that later-stage pregnancies ( $\geq 24$  weeks) have higher proportion of Hb deficiency (Hb) level  $< 11$  g/dl compared to earlier stage ( $< 24$  weeks). The proportion of all pregnant women with Hb level  $< 11$  g/dl has been consistent across the reporting period, reaching a peak of 31.1% in Q4-2017 and a minimum of 26% for Q1 and Q2-2016. Further patterns by pregnancy stage are reflected in Figure 9.

### Birth outcomes

Birth outcomes were reported for all deliveries conducted at the sentinel sites that offer maternity services. The proportion of babies born with low birth weight was fairly consistent across the reporting period, hovering around 6% except for Q4-2017, where it slightly increased to 6.5%. Neural tube defects (NTDs) were prevalent, with increasing trends across the reporting period; a peak of 95 cases was reported in Q4-2017 (an increase from 79 in Q3-2017) out of a total of 33,239 births reported from maternity sites enrolled for the surveillance intervention. The lowest number of three cases in Q1-2016 is associated with under-reporting during the initial phases of the intervention due to non-standardised case definitions, which subsequently improved over the reporting period. NTDs (anencephaly, spina bifida and encephalopathy) have a strong association with folic acid deficiency.

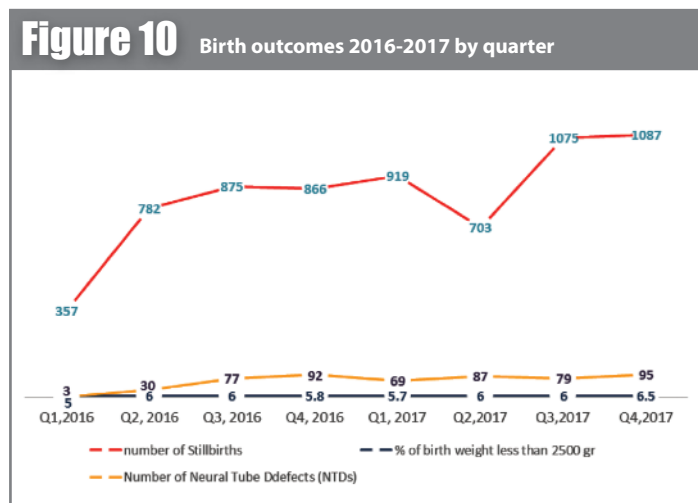
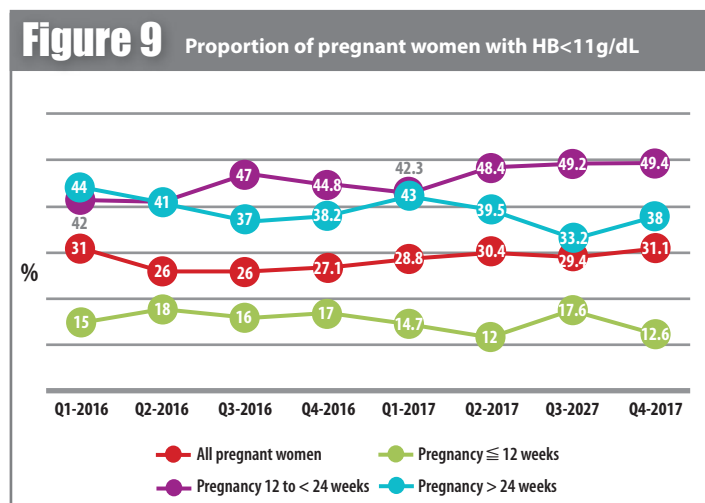
### Use of data

Data collected are of primary use by the health facilities and community posts. Beyond the health facility, central government uses the data to forecast trends in malnutrition and initiate in-depth assessments to establish the extent of the problem. Non-governmental organisations (NGOs) may use the data to support in-depth assessments in areas identified, on the basis of which subsequent assistance may be provided. In 2016 Action Contre la Faim (ACF) received funding to conduct SMART assessments to determine current nutrition status of children, based on triangulation of trends observed in

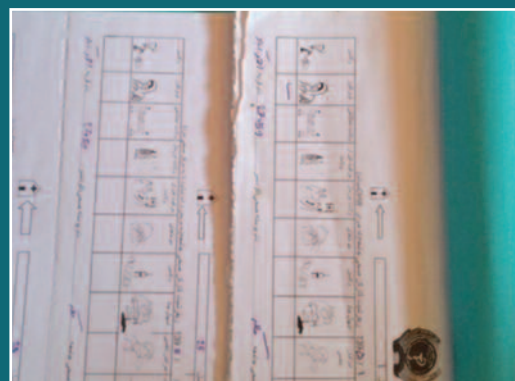
the western region as well as HMIS and routine admissions data. Sub-national level data enables location-specific analysis, planning and intervention, which is particularly useful for health facilities compared to data produced at provincial level using statistical methods. Currently the database reports the data at provincial aggregate level, and follow-ups are made to health facilities for specific issues or unusual trends observed. At national level NNSS data is used as one of the data sources when developing the Humanitarian Needs Overview (HNO) – the early warning function. The nutrition trends data was used in the prioritisation matrix in developing the 2017 Humanitarian Response Plan (HRP). In 2016 NNSS child nutrition trend data was used to inform in-depth population assessments. One of the provinces, Herat province, was prioritised for assessment through triangulation of NNS, HMIS and nutrition routine data. Observing the high levels of NTDs as well as anaemia levels among pregnant women resulted in the nutrition department reviewing the iron and folic acid supplementation intervention, after which it was noted that improvements in coverage as well as adherence to national protocols were needed.

### Discussion

The trends are showing generally high levels of acute malnutrition amongst children  $< 2$  years old. Similarly, general high levels of maternal malnutrition have been observed (30% with low Hb levels). Cyclical trends in the 2016-2017 period have emerged, with peak levels of acute malnutrition being observed for Q4 and the lowest levels in Q1. The main planting season in the country is between October and February, which coincides with the winter season. In recent years the winter agricultural season has been affected by low snow precipitation, river flows and dam levels compounded by inadequate moisture levels. There is likelihood of an association between the peak GAM levels and the poor agricultural season, although further analysis of the other existing EWSs may be needed to substantiate the extent to which the trends are related.



Sample of a completed health facility nutrition surveillance register, Herat Province, Afghanistan, June 2016



Referral slip from community level, Samangan province, Afghanistan, June 2016

WHO programme monitoring pictures

The GAM trends are largely similar for health facility and community sites, but GAM and SAM trends show a decreasing trend at community compared to health facility sites (2016 compared to 2017). It should be noted that, with increased mentoring, CHWs are better able to identify malnutrition cases and therefore community surveillance is identifying a significant proportion of acute malnutrition cases. However, it should be noted that community sites only carry out MUAC screening, while health facilities carry out more detailed assessments; therefore the community is an initial point for further referral. A bias is expected of the likelihood of sicker children presenting at the hospitals and hence elevated proportions of acute malnutrition is. These trends, as evidenced by the similar GAM trends observed at health facilities, point towards early detection; therefore strengthening of community referral systems is essential.

## Lessons learned

It takes time to develop a fully functional nutrition information system. It has taken five years of continuous investments for Afghanistan to start realising the usefulness of the routine trend data. A phased approach in implementing the surveillance intervention ensured that critical lessons in the early phases were applied in the subsequent phases. Programme development at multiple levels and inter-departmental involvement enhances acceptability and likelihood of sustaining the intervention beyond project life. Maternal and child health outcomes are spread across the Nutrition, Reproductive and Maternal Child Health Departments, hence any efforts in improving data collection, reporting and analysis systems require active involvement of these key departments. Any exclusions will greatly stall the intervention and harmonisation may be far-fetched.

Too many indicators may affect data quality; therefore 'less is more'. Some indicators, such as detailed IYCF assessment, may require surveys as they are more prone to measurement error and require considerable time, which may be impractical at a health facility providing routine services. Extensive indicator collection is beyond the capacity and time of a typical CHW. CHWs are an integral part of the health system and

their role in screening, counselling and referrals needs to be strengthened. Options to improve performance (such as performance-based incentives in cash or kind) could be explored in different contexts.

In selecting sentinel sites, health facilities must be connected to community sites to facilitate monitoring as well as to link services. This approach follows the continuum of care logic whereby mothers and children receive referrals to and from health facilities, hence referrals can be tracked and easily followed up. The quality of routine data is always an issue, particularly in fragile environments like Afghanistan where insecurity may affect staff retention as well as monitoring of sites. It is therefore essential to factor in accessibility as one of the key criteria when selecting sentinel sites. Options to include children from inaccessible and insecure areas have been challenging, but the availability and use of mobile health teams is being considered nationally to capture the hard-to-reach children as much as is feasibly possible.

Selection of subjects to be entered into the surveillance registers may need to be exhaustive rather than a sample so as to minimise potential bias encountered during the assessments. This will ensure that entry into the registers is ongoing and will help keep track of actual caseloads, as well as help identify at-risk mothers and children visiting the health facilities.

## Sustainable integration steps

Data are currently collected by health workers at health facilities at no additional cost. Timely and early feedback to health facilities on data is a simple way to help ensure data quality. The health workers' capacity on nutrition surveillance processes has been continuously enhanced throughout the life of the intervention. Integration into the HMIS of key indicators will be the major milestone for ensuring continuity of the system. Having a sentinel system has been a strategy to avoid overloading the HMIS system; collecting too many indicators compromises the quality of data. The current nutrition indicators being collected through the HMIS at community level are number of children screened and referred using MUAC. At health-facility

level, data is gathered on number of children weighed, number of children with acute malnutrition, low birth weight, and acute malnutrition management (admissions, cured, referrals, deaths and defaulters). The strategy of integration will apply lessons learnt from implementing the sentinel-based system.

The integration process has begun and includes steps for reviewing and updating the current nutrition indicators in the HMIS, modifying and adding more key indicators and maintaining a sentinel system which collects detailed indicators. In view of quality and reliability, a few IYCF indicators have been proposed to be collected at health facility level; early initiation as well as continued breastfeeding. The other detailed IYCF indicators will be collected in the periodic surveys. NTDs and anaemia in pregnancy have also been proposed for the HMIS, with the possibility of running a sub-database to maintain the other detailed indicators that cannot be integrated into the HMIS. This means the reviewed HMIS will run alongside the sentinel sites until full integration is achieved with the migration to the DHIS2 platform, an MoPH data warehouse (an online health information management system) that is being developed for the country. The DHIS2 is an improvement from the previous static HMIS system and the new system is expected to have greater capacity to manage health information.

The value of the routine data will rest in its capability to establish trend analyses, as has been observed. For added value of investment, efforts need to be focused on improving the quality of routine health-facility data through regular supervision visits, standardising equipment in use, and motivation of health workers for routine data to serve as early warning for potential nutrition and health problems in the population. The CHWs' role in screening, counselling and referrals needs to be strengthened, as this facilitates early case detection, greater coverage and better treatment outcomes for children with acute malnutrition.

For more information, please contact Admire Chinjekure at [chinjekurea@who.int](mailto:chinjekurea@who.int); [achinjekure@gmail.com](mailto:achinjekure@gmail.com)



Mothers attending a focus group discussion, Northern Bar el Ghazal, South Sudan, 2018

Michael Mulipeter, Concern Worldwide

## Location: South Sudan

**What we know:** Emergency levels of global acute malnutrition (GAM) continue unabated in Northern Bar el Ghazal State in South Sudan due to ongoing food insecurity and disease.

**What this article adds:** Focus group discussions with mothers of malnourished children and key informant interviews were undertaken by Concern Worldwide at eight outpatient therapeutic programme (OTP) sites in Northern Bar el Ghazal State to provide insights into factors sustaining childhood malnutrition. Findings showed that mothers are incentivised to keep their children in malnutrition programmes to continue receiving nutritional products and to be admitted into general food distribution (GFD) programmes; household sharing and selling of nutrition products is common; children can become dependent on Plumpy'Nut, leading to readmission; mothers may default from OTPs due to household/childcare pressures; and mothers are concerned about the effectiveness of corn-soy blend (CSB) and the lack of medicines available, even when prescribed. Findings show a need to move away from giving food and nutrition products towards long-term agricultural and food security and livelihoods interventions to prevent malnutrition; targeting for GFD and other programmes must be carefully readdressed to avoid incentivising malnutrition; community-focused nutrition interventions and home visits should be expanded; and agencies must collaborate to prevent mothers attending multiple sites.

# Nutrition programming in Northern Bar el Ghazal, South Sudan: A time to reflect

By Natalie Sessions and Regine Koplow



Natalie Sessions is the Emergency Nutrition Programme Manager for the Surge Team, Concern Worldwide, based in Head Office.



Regine Koplow is the Senior Advisor for Food and Nutrition Security for Concern Worldwide, based in Head Office.

The visit by the Emergency Nutrition Programme Manager to South Sudan was made possible by the generous donation of European Civil Protection and Humanitarian Aid Operations (ECHO), which supports programme operations in Northern Bar el Ghazal.

## Background

Concern Worldwide has been operating nutrition treatment programmes in Northern Bar el Ghazal State in South Sudan since 1998. The State, after being ravaged by the war between North and South Sudan until 2005, has largely escaped the direct effects of the ongoing civil war and its population is mainly free to move around the region. Although still impacted by the broader indirect effects of the war (such as the economic crises), Northern Bar el Ghazal is reported to have the highest population of cattle in the country and has some of the most fertile lands. Despite these factors, emergency levels of global acute malnutrition (GAM) remain, as highlighted in a recent analysis on persistent GAM which noted that, “in the nearly ten-year period between September 2005 and November 2014, all but two GAM measurements registered above the emergency threshold of 15%.” (Young and Marchak, 2018). A SMART survey conducted by Concern Worldwide in November 2017 found GAM rates in Aweil West and Aweil North to be 15.2% and 18.5% respectively.

Reasons for the high rates of malnutrition in the country are relatively well known. They are immediately related to food insecurity (below-average harvests and soaring food prices seriously eroding people's ability to feed themselves) and disease (a failing health system and a lack of available medicine to treat basic childhood illnesses). However, a recent series of focus group discussions (FGDs) and key informant interviews (KIIs) in the two counties provide considerable insights into individual and household factors that may be helping sustain childhood malnutrition.

## Methods

Eight FGDs were held with groups of seven to ten caregivers and 24 KIIs (with Boma Health Committee members, Health Facility in-charge's,

community nutrition volunteers, Concern Worldwide nutrition staff and village elders) in eight nutrition sites in both counties. Nutrition sites were selected purposefully by the two Nutrition Programme Managers in Aweil West and Aweil North to give a range of perspectives and were paired to allow for comparison between the most contrasting sites (based on accessibility, defaulter rates, relapse rates and quality of farming land). Sampling may have been prone to bias, although it must be noted that the study was only meant to provide insights into programming and was not designed to as a stringent qualitative study. FGDs were held on outpatient therapeutic programme (OTP)/targeted supplementary feeding programme (TSFP) days, when mothers were already available at each site. The OTP supervisor explained the purpose of the FGD to mothers and seven to ten mothers willing to take part were then selected at random.

A predetermined set of eight questions was asked of each group and every key informant. Each FGD and KII was conducted by the Emergency Nutrition Programme Manager, with a Project Officer acting as translator. Having Project Officers well known to the communities acting as translators may have created some bias in the answers provided but, given the tight time schedule of the FGDs, this was unavoidable. As a mechanism to mitigate this, interviews were recorded which enabled future translation checks to be made. Detailed notes were also taken during the interviews. Following interviews, detailed notes and interview recordings were transcribed to allow for analysis. NVivo software was used to identify key themes and commonalities in responses. Analysis was done by the Emergency Nutrition Programme Manager with support from the South Sudan Nutrition Team and broader input from the Senior Nutrition Advisor.



Mothers whose children attending an outpatient therapeutic programme (OTP), Northern Bar al Ghazal, South Sudan, 2018

## Results

### *Mothers wanting their children to be part of the programme*

Many informants alluded to the fact that mothers want their children to be part of the nutrition programmes because they are seen as a way of obtaining food for the whole family. Key informants also reported that mothers “don’t need children to get discharged from the programmes” as having a child in the programme takes the stress off having to provide for their families.

Participants added that, when children are discharged from the programme, mothers become stressed because they don’t know how they will feed their children again. They went on to note that, when the child has ready-to-use therapeutic food (RUTF, in this case Plumpy’Nut) or Supercereal (previously known as fortified corn-soya blend flour (CSB)), it gives the mother time to do other things and look for work, rather than having to breastfeed the whole day<sup>1</sup>.

Key informants noted that mothers know that if their child recovers, they will no longer be eligible to receive CSB or Plumpy’Nut, so “Sometimes mothers try to control things so that their child doesn’t fully recover”, because then they would be discharged.

This could partially explain why, when analysing registers of children admitted into community-based management of acute malnutrition (CMAM) services during September to December 2017, there was a significant preference for a MUAC of 114mm in many of the sites (a reading of less than 115mm is the criterion for being admitted into severe acute malnutrition (SAM) programmes and thereby receiving therapeutic food). Compared to other populations, this prevalence of MUAC 114mm is high and could reflect the notion of the community ‘wanting’ children to be retained in SAM treatment programmes.

### *Incentives to be admitted or readmitted: Linkages to other services*

Currently, programme registration lists are used as criteria for admission into general food distribution (GFD) programmes. This link was mentioned numerous times in all FGDs. Key informants commented that, because mothers want to get GFD ration cards, they try to be part of SAM treatment programmes. Furthermore, it was reported by informants that they

sometimes register at multiple nutrition sites then, once registered, default from the programme. The phenomenon of attending multiple nutrition sites has been known in the country for several years, with the World Food Programme (WFP) previously supplying ink to nutrition sites and developing protocols for all nutrition-implementing partners to ink children’s fingers once rations have been provided. Informants reported that, while there was previously ink at nutrition sites, now there is none available.

Another concerning aspect mentioned was the control of distributions by village chiefs, particularly in relation to who receives rations and how much of beneficiary’s rations are redistributed to village elders and chiefs.

### *Incentives to be admitted or readmitted: Sharing and selling of food*

The fact that the nutrition products are being used for other purposes was touched upon in almost all FGDs. The maternal feeling that you can’t give the Plumpy’Nut or CSB to only one child came out strongly. Mothers highlighted that it is better to share the food so that their other children don’t get malnourished as well. Mothers emphasised that: “You can’t make special porridge for one child while the others do not get anything.” Another group of mothers said: “Even though you are told at the health facility ‘This is only for the sick child’, you worry about the other children, so it’s better to sell it so you can provide for your whole family.”

It was noted that women use the rations to prepare food for the whole family, particularly when provided with CSB. Key informants said: “If you give the RUTF or CSB to mothers, they might give the children one sachet and then take the rest to the market to sell so that they can feed the rest of the family.”

Other key informants confirmed that sharing and selling of the RUTF is very common as people see it as food and view nutritional commodities “as a valuable asset to be taken to the market.”

### *Negative longer-term impacts of having children in programmes*

Mothers noted that children go from having three sachets of Plumpy’Nut a day when in the programme to just one meal, which makes them more likely to become malnourished again. Mothers asserted that “stress is the cause, because

the child is missing the Plumpy’Nut” and worry that there isn’t enough food at home to feed the child. Other participants confirmed that children get used to the Plumpy’Nut, with one participant commenting: “When it is not there, they miss it.” Mothers elaborated: “The child gets used to the Plumpy’Nut and doesn’t like any other food.” This could potentially create a negative cycle in which children are at risk of returning to nutrition programmes.

### *Going to the programme prevents other work from being done*

Women in the FGDs explained that having to come to the nutrition sites every week prevents them from doing other work, such as collecting firewood, going to the market to sell or groundnut paste, and cultivating their lands to produce food for the family. Many of the women noted that in the past these tasks were done by their husbands but, due to them no longer being there (due to having become soldiers, being sick, having died, being in Sudan, or having many wives), responsibility was left to the women, which meant limited time to care for their children. Such work is vital to improve the household economic situation, increase food security and prevent malnutrition.

Almost all groups mentioned this when discussing why children default from the programmes. Community nutrition volunteers noted that “Mothers would prioritise other tasks over coming to the facility.” This was reiterated by mothers saying, “The sickness won’t finish and it disturbs my business so it is better to go look for food for the rest of the family, rather than just focusing on one child.” Furthermore, mothers felt “You don’t want to risk the other children dying to just get the Plumpy’Nut that is only benefitting one child.” Mothers noted that, because they still want their children to get the nutrition products, they often send an older sibling with the child to the nutrition sites, but that this is not allowed by nutrition staff, who insist on mothers coming to receive nutrition education.

### *Suspicion around nutrition products*

Although most of the products were accepted and even welcomed, there appeared some suspicion in relation to CSB. Some mothers noted that it causes diarrhoea, which is why children don’t get better often don’t respond to the CSB. They felt that this was not the case when children were given RUTF or ready-to-use supplementary food (RUSF). Mothers also argued that when children were given the CSB and it didn’t help them to gain weight, so it must not work.

### *A lack of medicines and functioning health systems seriously impacts on malnutrition rates*

All groups noted that there are no medicines at the health facilities so, even when they take their child to get treated for diseases, there is no treatment available. They said that sometimes the health staff will give them prescriptions to

<sup>1</sup> Worryingly, this could indicate that nutrition programmes may be eroding good breastfeeding practices.

purchase drugs at pharmacies in the markets, but that often the medicines are too expensive. This, they noted, severely impacts on malnutrition rates as: “Even if you take your child to the health facility and want them to be treated early, you can’t, so you wait for the child to become malnourished.”

### What can be done?

The FGDs reveal issues that the nutrition community has known about for many years but is still grappling to mitigate. In recent years, Concern has shifted emphasis in Northern Bar el Ghazal from emergency programming to a focus on building resilience and delivering sustainable and preventative interventions. This has involved the scaling-up of food security and livelihoods (FSL) interventions and the current piloting of a programme to strengthen preventative actions for nutrition. However, the findings of these FGDs highlight that more still needs to be done in relation to building resilience around nutrition. Not just for Concern, but for all those focussed on treating and preventing acute malnutrition, it is important to think critically about how to implement programmes to avoid any unintended consequences. Some potential options to explore include:

- **Moving programming away from simply giving food and nutrition products:** Programmes should consider how to effectively transition families out of such crises. A comprehensive package of services, involving multiple sectors, is needed. A ‘food-first’ focus continues to dominate thinking and practice in preventing and responding to nutrition emergencies, but these findings, verified by previous analysis of malnutrition in the area<sup>2</sup>, suggest that a lack of food may not be the main driver of malnutrition and thus should not be the main focus of interventions. An additional focus on water, hygiene and sanitation (WASH) interventions as well as on strengthening the health systems in the areas of operation, including ensuring continual access to essential medications, should be given priority. Establishing stronger linkages with integrated community case management should also be considered essential. Furthermore, including hygiene promoters in nutrition

centres and providing mothers with buckets with fitted lids (to prevent contamination) on discharge from the programmes could improve the overall nutrition situation in the community. A truly comprehensive package of services will require additional funding and may take time to reduce the dependency on food-based interventions. However, as these findings show, it is critical to move away from a ‘business-as-usual’ approach in order to really make a difference to the nutrition situation in Northern Bar el Ghazal.

- **Moving to more sustainable, long-term interventions by scaling up agricultural interventions and broadening FSL activities** should also be considered a priority. This should include training farmers on how to create seed banks for communities and developing strategies to encourage people to cultivate their own lands. However, caution is needed in targeting FSL activities through nutritional vulnerability as this can lead to dependency. Instead, targeting should be administered at a community and individual level. Screening for malnutrition can then be integrated into FSL programmes.
- **Better targeting for GFD and other non-nutrition programmes:** It is clear from FGD feedback that the targeting for GFDs and other non-nutrition programmes is problematic and can create dependence on programmes and disincentives for discharge. Better tools for targeting should be developed; simply being part of the nutrition programme should not be the sole criterion. Other factors to be explored in vulnerability assessments could include available food in the household, means of economic engagement and number of children in the household, among others. Targeting could include healthy children in order to incentivise caregivers to keep their children well-nourished, rather than the current situation that seems to incentivise caregivers to have malnourished children. Alternative targeting criteria may be more effective, such as children under two years of age, female or child-headed households and/or number of dependents in the household.
- **Expanding community focused nutrition interventions and increasing home visits:**



Mothers attending a focus group discussion, Northern Bar el Ghazal, South Sudan, 2018

Expanding the preventative aspects of the programme is critical. Concern is currently piloting a five-year, WFP-funded project in several payams<sup>3</sup> in Northern Bar el Ghazal to strengthen malnutrition prevention approaches through mother-to-mother support groups and male change agents to catalyse behaviour change. Through these groups mothers are trained and supported to establish vegetable kitchen gardens and educated on the importance of exclusive breastfeeding and handwashing practices, and broadening linkages between nutrition and agricultural interventions. Such programmes do not target beneficiaries according to nutritional status but by vulnerability, usually through a community wealth-ranking exercise, ownership of land and, in some instances, presence of children under two years old. Such programmes should, if possible, be scaled up by Concern and other partners.

- **The need for a collaborative effort between NGO partners:** As noted previously, there are multiple actors working on malnutrition in the region and it is vital that services are mapped out and analysed to ensure that they are in areas of most need and to limit mothers trying to attend multiple nutrition sites for services. All actors must agree on an approach to be used in order not to undermine one another.

For more information, please contact Natalie Sessions at [Natalie.sessions@concern.net](mailto:Natalie.sessions@concern.net)

<sup>2</sup> Aweil West and Aweil North. SMART survey report. November 2017; ACF SQUEAC Report in February 2016; Feinstein International Centre Publication on Persistent Global Acute Malnutrition, Case Study: Northern Bar el Ghazal, South Sudan. January 2018.

<sup>3</sup> A payam is the second-lowest administrative division, below a county, in South Sudan. A payam is required to have a minimum population of 25,000. They are further sub-divided into bomas. As of 2017, South Sudan had 540 payams and 2,500 bomas.

### References

Young H and Marchak A. 2018. Persistent Global Acute Malnutrition: A discussion paper on the scope of the problem, its drivers and recommendations for policy, practice and research. Feinstein International Centre Publication. January 2018.



Mothers attending a focus group discussion, Northern Bar el Ghazal, South Sudan, 2018

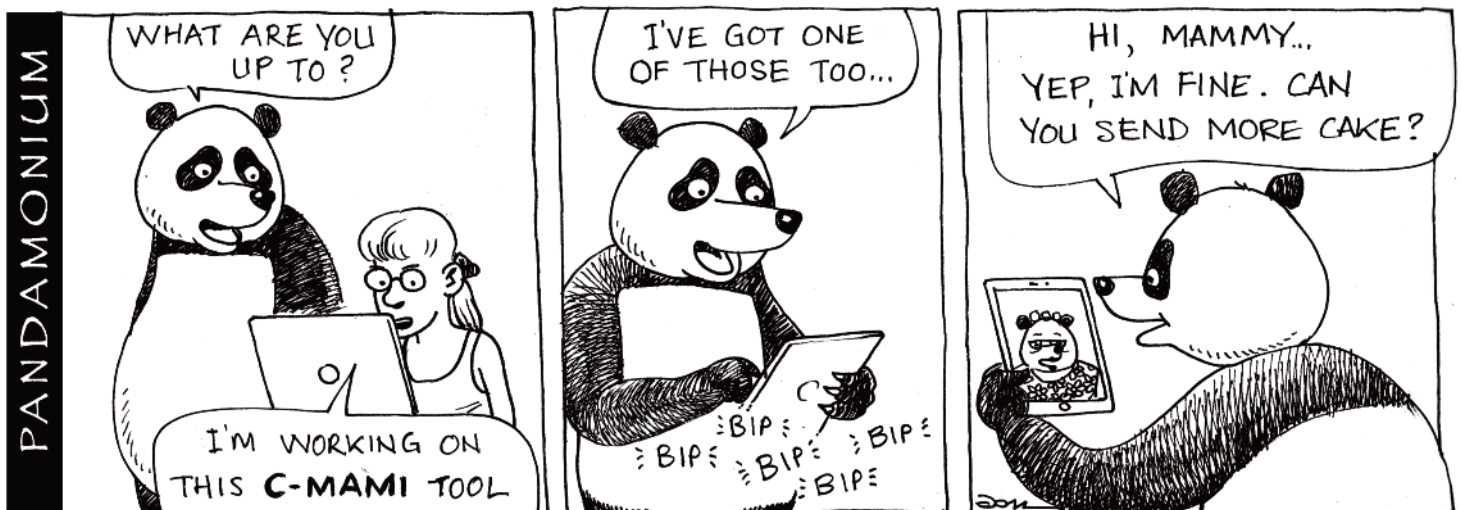




Participants in WHO guideline development meeting on breastfeeding counselling, Geneva, June 2018



SHA team conducting a nutrition survey, Luwingu, Northern Province, Zambia, 2017



### Editorial team

Jeremy Shoham  
Marie McGrath  
Chloe Angood  
Nick Mickshick  
Josephine Ippe  
Carmel Dolan

### Office Support

Clara Ramsay  
Judith Fitzgerald  
Mary Murray  
Peter Tevret

### Design

Orna O'Reilly/Big Cheese Design.com

### Website

Phil Wilks

### Contributors for this issue:

Abu Ahmed Shamim	Kathryn Beck
Admire Chinjekure	Lindsey Green
Alexandra Pirola	Mara Nyawo
Alice Burrell	Marjorie Volege
Anna Ziolkovska	Marko Kerac
Anne Marie Kueter	Mary Corbett
Benedict Tabiojong Mbeng	Md Masud Rana
Bruce W Larkin	Megan Gayford
Catherine M. Kirk	Mercy Laker
Chloe Puett	Mica Jenkins
Christine Mutaganzwa	Minh Tram Le
Claudine Prudhon	Mohammed Ali Elamin
Colleen Emary	Mostofa Sarwar
Dr Abdul Baseer Qureshi	Mueni Mutunga
Dr Binyam Woldetsadik Gebru	Najwa Al-Dheeb
Dr Mohammad Qasem Shams	Natalie Sessions
Dr Noor Rahman Noor	Natasha Lelijveld
Dr Sayed Ezatullah Majeed	Nicki Connell
Dr Shaifullah Safi	Patrick Codjia
Dr Soma Emmanuel	Pilar Charle
Eleanor Rogers	Rashid Abdulai
Emily Keane	Regine Koplow
Evrard Nahimana	Rudaba Khondker
Fanny Cassard	Sara Gari
Fatmata Fatima Sesay	Sarah Butler
Franck G. B. Alé	Sarah Morgan
Golam Mothabbir	Saul Guerrero
Grana Pu Selvi	Stanley Chitekwe
Habibur Rahaman	Stephanie Stern
Hatty Barthorp	Syed Muntasir Ridwan
Huan Nguyen Van	Thach Nguyen Ngoc
Ishrat Jahan	Tony Waterston
Jana Daher	Victoria Sauveplane-Stir
Jannaty Mayna	
Jessica Bradford	
Jose Luis Alvarez Morán	
Joseph Scott	
Julie Tanaka	
Karen Martínez	

Thanks to all who contributed or helped source pictures for this issue.

### Front cover

Field research officers interview a mother in Barisal, Bangladesh, 2016; Save the Children

@theononline  
 @ENNonline  
 ENN (Emergency Nutrition Network)  
 ENN Online  
 ENN Online

## 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: 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.ennonline.net](http://www.ennonline.net)

## The Team



Jeremy Shoham and Marie McGrath are *Field Exchange* Co-Editors and Technical Directors.



Carmel Dolan, Emily Mates and Tanya Khara are Technical Directors.



Chloe Angood is *Field Exchange* sub-editor.



Tui Swinnen is ENN's Global Knowledge Management Coordinator (SUN Movement).



Charulatha Banerjee is ENN's Regional Knowledge Management Specialist for Asia, based in India.



Ambarka Youssoufane is ENN's Regional Knowledge Management Specialist for West Africa, based in Senegal.



Lillian Karanja-Odhiambo is ENN's Regional Knowledge Management Specialist for East and Southern Africa, based in Kenya.



Judith Fitzgerald, is the ENN Office Manager based in Oxford.



Peter Tevret is ENN's Senior Finance Manager, based in Oxford.



Clara Ramsay is the ENN's Finance Assistant, based in Oxford.



Mary Murray is Administrative Assistant at ENN, based in Oxford.



Azaria Morgan is SUN Project Assistant, based in London.



Orna O'Reilly designs and produces all of ENN's publications.

## supported by:



The Emergency Nutrition Network (ENN) is a registered charity in the UK (charity registration no: 1115156) and a company limited by guarantee and not having a share capital in the UK (company registration no: 4889844). Registered address: 32, Leopold Street, Oxford, OX4 1TW, UK. ENN Directors/ Trustees: Marie McGrath, Jeremy Shoham, Bruce Laurence, Nigel Milway, Victoria Lack and Anna Taylor.





**ENN**

32, Leopold Street, Oxford, OX4 1TW, UK

Tel: +44 (0)1 865 324996

Fax: +44 (0)1 865 597669

Email: [office@ennonline.net](mailto:office@ennonline.net)

[www.ennonline.net](http://www.ennonline.net)

