

Field Exchange

Emergency Nutrition Network



Nutrition surveillance in South Sudan and Syria

Proposed indicator to estimate acute malnutrition caseloads in Afghanistan

Barriers to minimum dietary diversity of infants in Bangladesh

Cost of the diet analysis in Central Africa Republic

Addressing undernutrition in pregnancy in India

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Dear readers,
Chers Lecteurs,

We dedicate this edition of *Field Exchange* to the life and work of Claudine Prudhon, who sadly and prematurely died in October this year. Anyone who met Claudine will have been touched by her open-mindedness, curiosity, kindness and natural interest in people, combined with a wonderful sense of humour. Any of you who didn't meet her in person may well have been touched by her professionally through her years of dedicated work to international nutrition.

Cette édition de Field Exchange est dédiée à la vie et au travail de Claudine Prudhon, auxquels nous souhaiterions rendre hommage. C'est avec tristesse que nous avons appris la disparition prématurée de Claudine en octobre de cette année. Son ouverture d'esprit, sa curiosité, sa gentillesse, son intérêt naturel pour les autres - sans compter son magnifique sens de l'humour - n'auront pas manqué de toucher profondément toutes celles et ceux qui l'ont connue.

On a personal level, Claudine was thirsty for any kind of culture (art, music, literature, theatre, dance) and had an equally deep passion for food and gastronomy (and wine!). Her professional life was just as rich, a career that began back in 1990 as a research assistant at the Hospital for Sick Children (Necker) in Paris. Following a course in Statistics and Epidemiology, she embarked on a PhD specialising in Nutrition in Developing Countries. This marked the beginning of her international career, first spending six years with ACF in Paris as Nutrition and Research Officer and progressing to Head of the Nutrition Department there (they wisely saw her potential).

Claudine avait toujours soif de culture (l'art - de préférence contemporain, la musique, la littérature, le théâtre, la danse) et montrait un appétit insatiable pour tout ce qui touche à la gastronomie (et au vin!). Sa vie professionnelle aura été tout aussi riche, avec une carrière qui débute en 1990 comme assistante de recherche à l'Hôpital des Enfants Malades de Necker, à Paris. Après un DEA en épidémiologie et statistiques, elle se lance dans un doctorat portant sur la nutrition dans les pays en voie de développement. Cela marque le début de sa carrière internationale, d'abord en tant que personne ressource en nutrition/recherche à ACF-Paris pendant 6 ans, puis comme responsable du département de nutrition (son potentiel ayant tout naturellement été remarqué par ACF).



In 2002 she went on to join the UN Standing Committee on Nutrition in Geneva as a Nutrition Epidemiologist and after six years, she joined WHO Health and Nutrition Tracking Service, staying with WHO up to 2014 (perhaps six was her magic number?!). From then until just recently, she worked in a wealth of consultancy roles, including at ENN and as a researcher with Save the Children UK on infant and young child feeding in emergencies. In amongst all this she somehow managed to 'secretly' squeeze in a MSc in Epidemiology by Distance Learning at the London School of Hygiene & Tropical Medicine in 2015, graduating in March 2016.

En 2002, Claudine rejoint le Sous-Comité de la Nutrition des Nations Unies à Genève en tant qu'épidémiologiste spécialisée en nutrition. Six années plus tard, elle intègre le département de Health and Nutrition Tracking Service (HNTS) de l'OMS, et cela jusqu'en 2014 (à se demander si le 6 n'était pas son nombre fétiche?!). Depuis et jusqu'à très récemment, Claudine a eu un rôle de consultante dans un nombre impressionnant de structures, y compris pour ENN, et a travaillé comme chercheuse avec Save the Children UK sur l'alimentation du nourrisson et du jeune enfant dans les situations de crise. En 2015, elle obtient un Masters en Épidémiologie qu'elle a suivi secrètement à distance à la London School of Hygiene and Tropical Medicine.

Claudine was diagnosed with Amyotrophic lateral sclerosis (ALS) in October 2016, a rare, degenerative neurological disease. Many of us will remember her in a wheel chair attending the ACF Research for Nutrition meeting in Paris in November 2017. She met many people there, smiling as usual, although she was already very weak at that time. She showed tremendous courage from her diagnosis to the very end to continue working and making the most of what she could do, a courage mo-

tivated by her incredible appetite for life. The fact that she continued to work until her closing breaths speaks volumes to her resilient spirit and her dedication to alleviating human suffering through her commitment to improving public health response in emergencies.

En octobre 2016, une sclérose latérale amyotrophique (SLA), une maladie neurodégénérative rare, a été diagnostiquée chez Claudine. Nous sommes nombreux à nous souvenir d'elle en fauteuil roulant à la réunion ACF sur la recherche en nutrition, en novembre 2017. Souriante, tout comme à son habitude, elle y fit de nombreuses rencontres, alors qu'elle était déjà très affaiblie. Elle aura fait preuve d'un courage immense depuis son diagnostic jusqu'à la toute fin, continuant de travailler et de profiter au maximum de ce dont elle pouvait encore profiter - courage motivé par son incroyable appétit pour la vie. Le fait d'avoir continué à travailler autant qu'elle l'a pu démontre de façon forte sa résilience et son engagement pour apaiser la souffrance humaine et notamment améliorer les interventions de santé publique dans les situations de crise.

Claudine was and remains a wonderful soul who will live on in the hearts, minds and work of our collective community. We will remember her with warmth and remain in awe of who she was and what she achieved in the time she had with us and extend our sincere condolences to her family and friends for their loss.

Claudine était et restera une âme exceptionnelle qui continuera à vivre dans les cœurs, les esprits et au sein de notre communauté. Nous nous souviendrons de Claudine avec chaleur et affection, et restons en admiration devant sa personne et tout ce qu'elle a accompli durant son temps précieux à nos côtés. Nous présentons nos condoléances les plus sincères à sa famille et ses amis face à leur perte.

Dear readers,

Welcome to the 61st edition of *Field Exchange*. In this general issue, three field articles speak to the need for robust information to aid effective nutrition responses. A field article by the World Health Organization describes the development and evolution of a nutrition-surveillance system in Syria leveraging the existing national growth-monitoring system. Data indicates that global acute malnutrition (GAM) prevalence has declined since 2015. This is attributable to multiple factors, including better early case detection and referral of severe and moderate acute malnutrition cases as a result of this system. Integrating surveillance within an existing government system no doubt increases the potential for scale and sustainability. Meanwhile, in South Sudan, an International Medical Corps team was established to fill a gap in quality and timely information to inform emergency programming, and provide information to the national surveillance system. The team describes the nuts and bolts of carrying out quality nutrition assessments and surveys in this context.

An article by Action Against Hunger examines the suitability of GAM to estimate caseloads of acute malnutrition in Afghanistan. There is poor correlation between weight-for-height z-score (WHZ) and mid-upper arm circumference (MUAC) in this context. Combined GAM (cGAM) is an aggregate indicator that includes all cases of GAM by WHZ <-2, MUAC <125 mm, and/or bilateral pitting oedema. The article makes a good case for estimating caseloads in this way and suggests a need for globally validated cut-offs.

Two articles describe challenges and initiatives to roll out services in hard-to-access populations. A field article by the United Nations Children's Fund (UNICEF) team in Afghanistan describes the integration of nutrition into mobile health teams to reach very remote populations with health and nutrition services as part of the national basic package of health services. This was a short-term option while the government scaled up nutrition services to those areas of the country. The strategy increased coverage successfully and created demand for services which otherwise didn't exist. The experience highlights that sometimes 'unsustainable' surges of support are needed in challenging contexts – in this instance, where access to services was a key barrier.

The second article describes the results of a cost-of-diet (CoD) analysis in Central African Republic (CAR) in a conflict-affected area. Results show that blanket food distributions to internally displaced persons (IDPs) and host populations are not enough to meet even basic energy needs for the poor and very poor. Interventions are needed to boost household food production, as well as extended rations.

Another article from a very different context, Bangladesh, also reports on a COD analysis;



Suchana project beneficiary harvesting produce from her vegetable garden, Sylhet Division, Bangladesh, 2017

Suchana Programme, Save the Children in Bangladesh

specifically, how households can achieve minimum acceptable diets for young children to inform a multi-sector programme. Results demonstrate the need to boost household income through multi-sector programming; social behaviour-change communication strategies are not enough on their own.

Maternal and adolescent nutrition also figure prominently in this edition. A study by a research institute in India examined the results of a pilot programme that aims to improve maternal nutrition, focusing on improving pregnancy weight gain. Routine nutrition support for pregnant mothers aligned with government policies and protocols was intensified, with some effect on weight gain, although weaknesses in the study design make it difficult to interpret the results. One interesting observation was the complexity of implementing a programme like this in the context of the double burden of disease; pregnant mothers included some who were undernourished and some who were obese. Blanket interventions are difficult when needs differ so greatly between individuals in the same communities. Training of health workers and intervention designs must consider these differences; the authors provide some valuable insights into how they did this.

A short study by UNICEF in Syria highlights the need for more research into the association between child marriage and stunting and the need to include stunting prevention in emergency programming across sectors (in this instance, child protection). Levels of child stunting are very high in Syria, in contrast to wasting prevalence, which has declined and is extremely low. The authors hypothesise that adolescent pregnancy (which is associated with low birth weight and stunted offspring) and conflict-related rises in child marriage may be important contributing factors to stubbornly high stunting prevalence. An expanded SMART survey to explore this proved inconclusive due to methodological flaws. However, this lack of direct 'evidence' is not holding the team back; UNICEF has now initiated an integrated health, nutrition and child protection (including disability and family abuse/detection surveillance) response. This experience highlights how stunting is an anthropometric marker of risk that is not specific to nutrition, and that we must consider factors and interventions beyond nutrition-specific activities when it comes to prevention. It also reflects the fact that stunting is still seen as a development concern, rather than a humanitarian one; it is only

being taken seriously seven years into the Syria 'emergency' response, even though prevalence of stunting has been consistently high for a number of years and is increasing in some areas.

We also feature an article that highlights efforts to support non-breastfed infants in the Rohingya response. Save the Children documents its frustrated attempts to meet the needs of these infants in accordance with World Health Assembly-endorsed, international guidance. Protracted negotiations to secure a breastmilk substitute (BMS) supply for identified infants eventually led to development of draft policy, but no country-level endorsement or resolution of programming shortfalls. Ensuring a predictable, secure BMS supply chain for infants in need has been a long-standing barrier to timely support to this particularly at-risk group. After considerable advocacy, significant change is finally afoot: UNICEF is finalising new Standardised Operating Procedures on handling BMS that stipulate that it will be 'provider of first resort' of BMS supplies. UNICEF has also been doing much work behind the scenes to prepare supplies division and procedures accordingly. A truly important development, it is now critical to invest in UNICEF country team orientation, support and capacity-development to support translation of this policy into practice.

Finally, we'd like to highlight a special section on the Global Technical Assistance Mechanism for Nutrition (GTAM); a common global mechanism, endorsed by over 40 Global Nutrition Cluster partners, to provide predictable, timely nutrition technical assistance on nutrition. The GTAM story so far is described in several articles, actively supported by ENN in its dedicated 'knowledge management' role in the coordination team.

As ever, a selection of the latest, most relevant research has been summarised as 'snapshots' for quick reads. There are also several 'bonus online' articles that don't appear in print, but are just as interesting a read – more of these to come, so keep checking in as we post them online.

Happy reading!

Chloe Angood, Marie McGrath and Jeremy Shoham,
Field Exchange Editors

www.enonline.net/fex

¹ Operational Guidance on Infant Feeding in Emergencies
www.enonline.net/operationalguidance-v3-2017

Improving minimum dietary diversity for children aged 6-23 months in northeast Bangladesh

By Md Masud Rana, Sheikh Shahed Rahman, Md Al-Amin Shovan, Bazlul Kabir Joarder and Mohammad Raisul Haque



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Dr Mohammad Raisul Haque is Senior Advisor – Nutrition for Save the Children in the Suchana programme. He has over two decades of public health service delivery and programme management experience for multiple NGOs and donor agencies. He holds a master's degree in population and reproductive health research and a PhD in demography.

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Suchana project beneficiary mother feeding her child, Sylhet Division, Bangladesh, 2017

Suchana Programme. Save the Children in Bangladesh

Location: *Bangladesh*

What we know: Multi-dimensional approaches are needed to achieve a minimum acceptable diet for young children to prevent stunting, including increasing household income.

What this article adds: Two studies were carried out to inform the Suchana programme (2015-2022) that aims to reduce stunting prevalence in Sylhet, Bangladesh through social and behaviour-change communication (SBCC), promoting optimal infant and young child feeding (IYCF) and household food production activities to increase household income and food availability. A barrier analysis among 106 mothers from 16 villages was performed to identify barriers to and boosters of minimum dietary diversity (MDD) among children aged 6-23 months. Household income and food price were important facilitators and misconceptions on consumption of an MDD and its benefits. Failure to remember to include diverse foods was a main barrier. Adaptations to the SBCC component were subsequently made to address this. A cost-of-the-diet (CotD) analysis was then performed to estimate the hypothetical minimum amount of money a typical household needs to purchase food to meet recommended nutrient intakes, analysed against current household income, expenditure, production and consumption. Findings show that all major nutrient requirements can be met using local markets and households can potentially afford a diet that meets energy, protein, fat and micronutrient requirements and takes into account typical dietary habits within existing levels of income, but not when non-food expenditures are taken into account. Free food from home food production activities goes some way to filling affordability gaps; however, more needs to be done to increase household income to achieve an MDD and intended programme outcomes.

Introduction

Bangladesh has made remarkable progress in reducing stunting and wasting in children under five years of age over the last 20 years. However, the rate of decline in the annual stunting rate has slowed in the last decade and an estimated six million children remain chronically undernourished (NIPORT and ICF International, 2016). More than one in three children suffer from impaired linear growth (i.e. stunting) with higher prevalence in rural areas (37.9%, versus 30.8% in urban areas) and among children from the lowest wealth quintile (49.2%, vs 19.4% in the

Table 1 Timeline of major nutrition-related activities in north-eastern Nigeria

Determinants (MDD for children 6-23 months)	Doers (#, %) (n=53)	Non-Doers (#, %) (n=53)	Difference	Odds Ratio	Estim. Relative Risk	p-value
1. Perceived self-efficacy: What makes it easy for you to feed your baby foods from at least four of these different food groups each day?						
Produce own food at home (vegetable gardens and/or poultry rearing)	42 (79%)	36 (68%)	11%	1.8	1.62	0.135
Market not far from home	24 (45%)	2 (4%)	42%	21.1	6.03	0.000
Adequate household income	6 (11%)	38 (72%)	60%	0.05	0.09	0.000
2. Perceived self-efficacy: What makes it difficult for you to feed your baby foods from at least four of these food groups each day?						
High food price	4 (8%)	8 (15%)	8%	0.46	0.52	0.179
Not enough income	35 (66%)	49 (2%)	26%	0.16	0.29	0.001
Market too far from home	7 (13%)	5 (9%)	4%	1.46	1.34	0.380
3. Perceived positive consequences: What are the advantages of feeding your baby foods from at least four of the different food groups each day?						
Increased immunity	40 (75%)	34 (64%)	11%	1.72	1.56	0.145
Child will grow faster	28 (53%)	27 (51%)	2%	1.08	1.06	0.500
Child will be more intelligent	35 (66%)	27 (51%)	15%	1.87	1.66	0.084
Increased weight	7 (13%)	1 (2%)	11%	7.91	3.51	0.030
4. Perceived negative consequences: What are the disadvantages of feeding your baby foods from at least four of these different food groups each day?						
Indigestion and/or diarrhoea	39 (74%)	35 (66%)	8%	1.43	1.34	0.263
Vomiting	12 (23%)	12 (23%)	0%	1.00	1.00	0.592
May suffer from breathing problem	2 (4%)	12 (23%)	19%	0.13	0.17	0.004
5. Perceived social norms: Who are the people that approve of you feeding your baby foods from at least four of these food groups each day?						
Mother-in-law	35 (66%)	23 (43%)	23%	2.54	2.11	0.016
Husband	44 (83%)	43 (81%)	2%	1.14	1.11	0.500
Relatives	12 (23%)	8 (15%)	8%	1.65	1.47	0.229
6. Perceived social norms: Who are the people that disapprove of you feeding your baby foods from at least four of these food groups each day?						
Mother-in-law	3 (6%)	9 (17%)	11%	0.29	0.35	0.061
Husband	2 (4%)	8 (15%)	11%	0.22	0.27	0.046
7. Perceived access: how difficult is it to get what you need to feed your baby foods from at least four of these food groups each day?						
Very difficult	9 (17%)	28 (53%)	36%	0.18	0.24	0.000
Somewhat difficult	27 (51%)	21 (40%)	11%	1.58	1.44	0.165
Not difficult at all	17 (32%)	4 (8%)	25%	5.78	3.32	0.001
8. Perceived cues for action/reminders: When you prepare meals for your child, how difficult is it to remember to include foods from at least four of these food groups?						
Very difficult	2 (4%)	4 (8%)	4%	0.48	0.54	0.339
Somewhat difficult	19 (36%)	2 (47%)	11%	0.63	0.69	0.162
Not difficult at all	32 (60%)	24 (45%)	15%	1.84	1.63	0.086
9. Perceived susceptibility/risk: How likely is it that your child will become malnourished in the coming year?						
Very likely	1 (2%)	16 (30%)	28%	0.04	0.06	0.000
Somewhat likely	28 (53%)	37 (70%)	17%	0.48	0.57	0.055
Not likely at all	24 (45%)	0 (0%)	45%	-	8.31	0.000
10. Perceived severity: How serious will it be if your child becomes malnourished in the coming year?						
Very serious	14 (26%)	33 (62%)	36%	0.22	0.29	0.000
Somewhat serious	32 (60%)	20 (38%)	23%	2.51	2.08	0.016
Not serious at all	7 (13%)	0 (0%)	13%	-	5.61	0.006
11. Perceived action efficacy: How likely is your child to get malnourished if you feed it foods from at least four of these food groups each day?						
Very likely	1 (2%)	2 (4%)	2%	0.49	0.55	0.500
Somewhat likely	14 (26%)	13 (25%)	2%	1.10	1.08	0.500
Not likely at all	38 (72%)	38 (72%)	0%	1.00	1.00	0.585
12. Divine will: Do you think that God approves of you feeding your child foods from at least four of these food groups each day?						
Yes	3 (6%)	2 (4%)	2%	1.53	1.39	0.500
No	50 (94%)	51 (96%)	2%	0.65	0.72	0.500
13. Culture: Are there any cultural rules/taboo against feeding your child at least four of these food groups each day?						
Yes	7 (13%)	2 (4%)	9%	3.88	2.54	0.080
No	46 (87%)	51 (96%)	9%	0.26	0.39	0.080

highest wealth quintile). Geographically, Sylhet division in the North-East of the country has the highest burden where around half of all children under five years are moderately to severely stunted (NIPORT and ICF International, 2016). While causal factors are multiple and poorly understood, research has identified several, including severe food insecurity; poor maternal nutrition; poverty; poor sanitation and hygiene practices; and inappropriate complementary feeding (Choudhury *et al*, 2016; Ahmed *et al*, 2016).

In response to the multi-dimensional challenges of malnutrition, the UK Department for International Development (DFID) and European Union (EU)-funded Suchana¹ programme aims to reduce prevalence of stunting in Sylhet Division. Suchana is a six-year (2015-2022), £48 million programme that aims to reach over 220,000 poor households (representing around 1.1 million people) by targeting women of reproductive age and/or adolescent girls. The programme provides a set of nutrition-specific and nutrition-sensitive interventions to improve household-level nutrition and food security and child care practices to break the inter-generational cycle of under-nutrition.² Suchana's nutrition-specific component includes a comprehensive set of social and behaviour-change communication (SBCC) interventions promoting optimal infant and young child feeding (IYCF) and maternal and child nutrition in the first 1,000 days. The nutrition-sensitive component promotes increases in household income and availability of food through home food production (HFP) interventions.

To ensure both types of interventions address context-specific immediate, underlying and basic causes of under-nutrition, Suchana carried out a barrier analysis and cost-of-the-diet (CotD) assessment in Sylhet and Moulvibazar districts within Sylhet Division. This article shares experiences and findings related to improvement of dietary diversity among young children that were used to inform the programme to improve outcomes further.

A barrier analysis: Identifying barriers to achieving minimum dietary diversity (MDD) of children in Sylhet and Moulvibazar districts

Methods

In October 2017, Suchana commissioned a barrier analysis to identify barriers to and boosters of minimum dietary diversity (MDD) among children aged 6-23 months in response to multiple programme monitoring assessments identifying MDD as the worst performing IYCF indicator. The baseline study undertaken in mid-2017 found only 14.7% of girls and 15% of boys received a diversified diet containing four or more food groups. The study primarily employed a 'doer/non-doer analysis' to identify behavioural determinants (barriers and enablers) among those who consumed a diversified diet ('doers') and those who did not ('non-doers'). It followed the barrier analysis methods specified in the 'designing for behaviour change framework' (TOPS, 2017; Kittle, 2013) and employed a cross-sectional survey of 106 mothers of children aged 6-23 months (53 doers and 53 non-doers) from 16 villages in the two districts.

Results

Table 1 shows a summary of the barriers and facilitators constructs generated from the data. Overall, an overwhelming proportion of respondents from both groups (doers and non-doers) identified economic factors (e.g. household income and food price) as the

¹ A Bengali word which means "the beginning of something positive".

² For further information, see: (i) <https://bangladesh.savethechildren.net/sites/bangladesh.savethechildren.net/files/library/Suchana.pdf>
(ii) <https://devtracker.dfid.gov.uk/projects/GB-1-204131>

main facilitator for achieving MDD. As most households were primarily reliant on markets for access to food, distance to the market was also a big predictor. The barrier analysis additionally identified existing misconceptions around consuming a diversified diet (e.g. certain foods can cause indigestion/breathing problems) and a lack of full understanding of the benefits, as well as perceived difficulty of remembering to include foods from different food groups, as other important determinants of MDD. Approval and support of husbands and mothers-in-law were found necessary for practising the behaviours. However, no social, cultural or religious restrictions or taboos against consumption of a diversified diet by women or children were identified.

Follow-up actions:

Based on the findings of this analysis, the existing SBCC strategy and activities were revised in early 2018, as follows:

- Specific messages were developed to raise awareness of the necessity and benefits of women and children aged 6-23 months consuming a diversified diet. All of the project-specific SBCC guidelines and materials were subsequently adapted to include these messages, using multiple communication channels to reinforce impact.
- To increase family members’ support, mothers-in-law were included in existing monthly mother and child group courtyard sessions and separate male groups were formed to inform husbands/male household members. In addition, frontline staff were trained to involve family members in discussions during household-level counselling sessions.
- A new poster on MDD was distributed which visually displays different food groups to help households remember to choose food from different groups.
- One of the major contributions of the barrier analysis was an understanding of the extent to which financial constraints affect consumption of a diversified diet in this context and the important contribution of the nutrition-sensitive component of the programme (i.e. income generation) in improving household affordability. To further inform this aspect of the programme, a CoDt assessment was subsequently conducted.

A CotD analysis: When affordability is a major barrier

Rationale and objectives

While the Suchana programme’s regular monitoring data was suggesting a notable increase in household income and increased availability of food from the HFP intervention, the barrier analysis identified affordability of nutritious food as a major barrier to dietary diversity. In response, a CotD analysis was conducted in Sylhet and Moulvibazar districts to investigate the extent of the gap between household income and expenditure. This would inform necessary adjustments in programme implementation to maximise the impact on child nutrition. Specifically, the assessment set out to estimate the minimum cost of a nutritionally adequate and culturally acceptable diet for typical households and estimate the potential effect of income-generating activities (IGAs) and the HFP intervention on a household’s ability to afford a nutritious diet.

Method

The CotD³ method and software were developed by Save the Children in order to estimate the hypothetical minimum amount of money a typical household would need to purchase food to meet recommended intakes of energy, protein, fat and micronutrients, using locally available foods (Deptford et al, 2017). Food price data were collected through a market survey involving 16 urban, peri-urban and rural markets in Sylhet and Moulvibazar. Local food consumption patterns and cultural practices were identified through individual interviews covering 84 individuals and 12 focus group discussions (FGDs). Household income and expenditure, household size and composition, and HFP and consumption data were obtained from the most recent programme survey.

Key findings

Overall, the analysis found that markets in Sylhet and Moulvibazar have a diverse range of food items and can fulfil all major macro- and micro-nutrient requirements for households. However, calcium was found to be most difficult to obtain; i.e. the most significant cost driver, followed by folic acid and vitamin B12.

The cost of four hypothetical diets was estimated using CotD software for a typical house-

hold of six individuals (including a 12-23 month-old child and a breastfeeding mother); including: (i) a lowest-cost diet that only meets recommended average energy requirements (energy only (EO) diet); (ii) a lowest-cost diet that meets the average energy and the recommended protein and fat requirements (macronutrient(MAC) diet); (iii) a lowest-cost diet that meets specifications for energy, protein, fat and micronutrients but does not take into account typical dietary habits (minimum-cost nutritious (NUT) diet); and, (iv) a lowest-cost diet that meets specifications for energy, protein, fat and micronutrients and takes into account typical dietary habits and cultural acceptability (food habit nutritious (FHAB) diet).

The lowest annual cost of an EO, MAC and NUT diet for a six-person household was BDT 40,630.00, BDT 41,523.00 and BDT 64,312.00 respectively (Figure 2). However, the cost of a FHAB diet was 67% higher than the NUT diet, at BDT 107,459 per year. Within the household (Figure 3), the cost of meeting the nutritional requirements of a breastfeeding women was highest (22% of the household cost of diet), followed by the adult male (21%) and 10-11 year old children (20%).

The affordability calculation (Figure 4) shows that households can potentially afford the FHAB diet, but cannot afford to meet both the cost of the diet and additional non-food expenditures (NFE) with their existing level of income. The affordability gap ranges from BDT 193 to BDT 14,181 per year, depending on the beneficiary type and their livelihoods options. However, when the effect of the HFP element of the programme, which provides free food for the household, was also taken into account (Figure 5), the annual cost of an FHAB diet was reduced by between 2.2% and 3.2% (16-24% reduction in the household affordability gap); this demonstrates some gain, albeit not as much as the project team expected.

Discussion and recommendations

It is well known that interventions focused on reducing poverty (i.e. generating income) as part of a multi-sector nutrition programme are

³ Further information about the CotD method is available from www.heacod.org

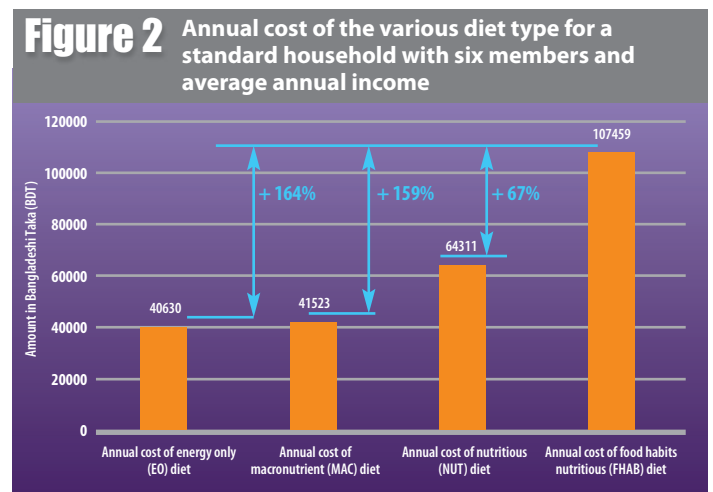
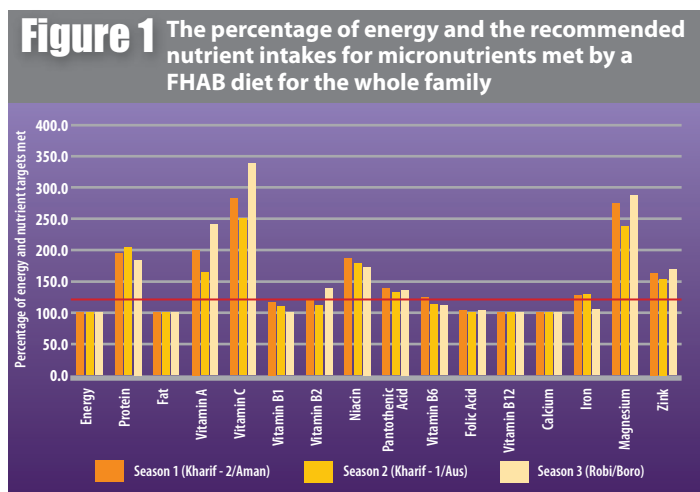
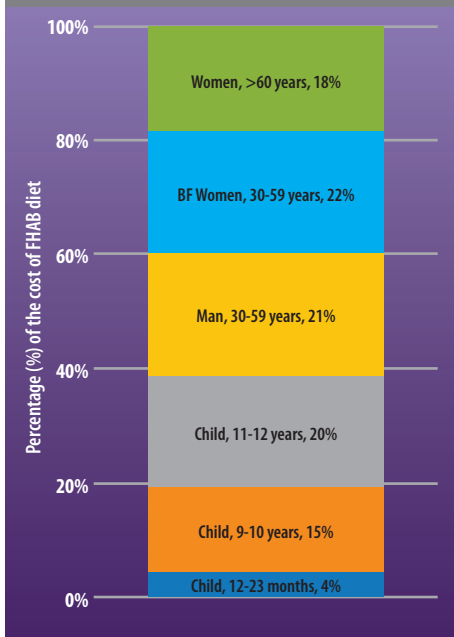


Figure 3 Individual cost of the diet expressed as a percentage of total cost of the FHAB diet



not enough to have a positive impact on nutritional outcomes. Household income must go beyond a certain threshold to enable household members to practice recommended child feeding practices. This CotD analysis set a benchmark for the livelihoods component of the Suchana programme, by which increases in household income could be monitored to ensure that they are large enough to meaningfully impact household food security and nutritional status. Results of the analysis indicate that the programme should consider identifying beneficiary households that are below this benchmark and struggling to cross the threshold to prioritise them for linkages with existing government social protection programmes.

When results of this CotD analysis are compared to a previous CotD analysis conducted in the same region in 2013, it appears that the current affordability gap (BDT 193 to BDT 14,181 per year) of very poor beneficiary house-

holds is significantly lower than the previous gap of BDT 39,300 per year. This reduction cannot necessarily be attributed to the programme intervention alone; however, there are strong reasons to believe that programme interventions are meaningfully contributing to it. Furthermore, the CotD modelling exercises show that the HFP interventions appear to be improving the availability and consumption of nutritious food at household level.

Nevertheless, gains were not as great as expected and more needs to be done to increase production to eliminate affordability gaps and to improve consumption to meet an MDD. The programme should therefore continue to aim to increase household income and food production and promote equitable intra-household food distribution and consumption through its SBCC activities. The Suchana programme is considering the following recommended actions as a result of the findings presented here:

- Revisit the programme's current livelihoods strategy and market system strategy to improve year-round production, linking beneficiaries with markets (and actions to identify potential ways) to further improve return on investment and household income.
- Strengthen activities that link the most vulnerable households with the government's social protection scheme, health and nutrition services, and other services.
- Conduct a cost-effectiveness analysis of the kitchen garden and HFP interventions to understand whether current production, loss-to-climate effect, access to market, consumption pattern and rate of return are cost-effective and investigate further opportunities to improve productivity and consumption.
- Use the FHAB diet cost as a benchmark to track the progress of beneficiary groups in upcoming socio-economic surveys and assessments and observe changes in affordability gap to assess whether new initiatives have worked.
- Promote the consumption of cheap, nutrient-rich foods identified by the CotD analysis through existing SBCC activities.

- Intensify efforts to further engage male family members in SBCC activities. The FGDs in the CotD data collection and previously conducted formative research highlighted the dominant role of husbands or male family members in household expenditure, food purchase decisions, access to markets and ultimately income generation. Without significantly engaging the male members in the process (and changing norms), the SBCC activities are unlikely to have a significant and lasting impact on changing behaviours and practices.

An independent evaluation is planned for the end of 2019, after which the impact of the Suchana programme on stunting prevalence will be reported.

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Figure 4 The affordability of an EO, NUT and FHAB diet by Suchana beneficiary type (IGA intervention type and phase)

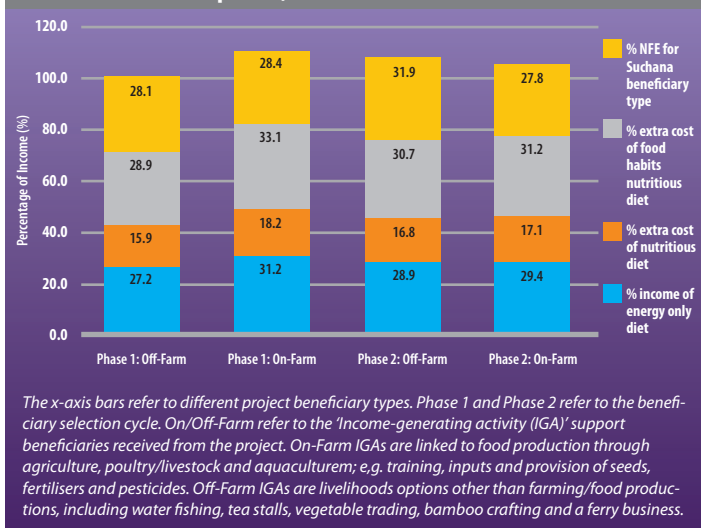
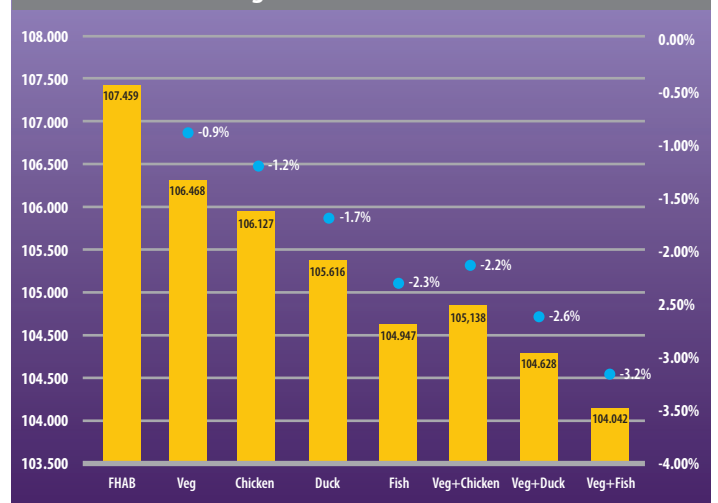


Figure 5 The potential effect of different HFP activities on the annual cost of an FHAB diet for a household with six members, including a child aged 12-23 months



Summary of an online-only field article

De Silva, H and Asir, M. Improving practical skills for breastfeeding vulnerable infants in low-resource settings: A case study from Rwanda. <https://www.enonline.net/fex/61/practicalskillsforbreastfeeding>

By Himali de Silva and Maya Asir, with contributions from Kathryn Beck, Catherine M Kirk, Gato Saidath, Marie Louise Manirakiza and Egide Karangwa



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Improving practical skills for breastfeeding vulnerable infants in low resource settings: A case study from Rwanda

A significant proportion of premature infants and infants with birth asphyxia and congenital anomalies who may appear to be able to feed using generic intervention strategies are unable to coordinate sucking, swallowing and breathing required for safe feeding. Without specific intervention strategies to minimise risks, these infants can go on to develop lower respiratory tract infections from aspirated material and malnutrition. Informed by a review of existing materials, the Working with Infants with Feeding Difficulties (WIFD) training package was developed to fill an identified gap in training content on feeding issues among such infants for frontline healthcare staff of neonatal intensive care and special-care baby units in low-resource settings (De Silva and Asir, 2017). WIFD focuses on timely identification and intervention to prevent deterioration of feeding and can be delivered as a standalone training or integrated into other relevant training programmes. The package is currently delivered by two course directors employed by Multi Agency International Training and Support (MAITS)¹ and consists of four hours of interactive, classroom-based training and five hours of practical work with guided observations, hands-on training and clinical discussions, usually delivered over two days. A five-to-six-day Training of Trainer course is also offered to train 'Master Trainers' to train, guide and supervise other health workers in their country and region, with continued support from the course directors. WIFD has so far been trialled in Malawi, Uganda, Sri Lanka and Rwanda across nine hospitals. A total of 175 healthcare staff have received training to date, including three Master Trainers.

Rwanda case study

WIFD was delivered to 21 health workers in Rwanda in February 2018 through a partnership between Partners in Health (PIH) and MAITS. The practical sessions were delivered in the neonatal care, post-partum, caesarean section and maternity units of Rwinkwavu District Hospital, a government hospital located in the eastern province of Rwanda. Three Master Trainers were trained by the course directors, selected on the basis of their backgrounds as nutritionists, nurses and midwives and desire to share knowledge and skills with others. Pre- and post-test evaluations demonstrated a self-reported rise in trainees' confidence, knowledge and practical skills in this topic (average pre-test score 54% and average post-test score 90%). Significant improvements were seen after the WIFD training (March-July 2018) compared to the pre-training period (October 2017-February 2018) in the initial two hospitals where training was conducted: breastfeeding on the day of birth increased from 11.3% (n=37/237) to 26.9% (n=111/413, p<0.001); delayed introduction of breastmilk until two days or later after birth reduced from 49.6% (n=235/474) to 36.2% (n=193/533, p<0.001); and exclusive feeding from the breast at discharge increased from 63.1% (n=279/442) to 75.9% (n=441/581, p<0.001).

There were non-significant trends of decline in neonatal unit mortality from 11.0% (n=61/493) of admissions to 8.1% (n=51/593, p=0.092) and no change in length of stay (mean of 10.4 days pre-training (n=554) and 10.5 days post-training (n=645, p=0.134) in the period immediately after training.²

Since the original training, two additional Master Trainers have been trained by the Master Trainers in Rwanda, with remote support from the course directors, and the Master Trainers have gone on to train an additional 70 health providers working across 10 district hospitals in all five provinces of Rwanda, reaching more than 4,400 mothers and babies. To ensure sustainability and consistent support for mothers in neonatal and post-partum units, a new hospital-based position of 'Expert Mother' was created. This position is now functioning in all three PIH-supported district hospitals in Rwanda, with two Expert Mothers per hospital. Expert Mothers are women who previously had a child on the neonatology unit and have received training and mentoring from Master Trainers to provide breastfeeding peer counselling to other mothers through mentorship, teaching and peer support.

Next steps

The Master Trainers in Rwanda will continue to provide mentorship to hospital neonatology and maternity unit-based staff, as well as the six Expert Mothers who have been trained with ongoing support from the course directors. There is also potential to use these Master Trainers to train other Master Trainers in other countries in the same region. PIH plans to continue to monitor the impact of the WIFD training, including the Expert Mothers intervention, and seek opportunities to expand the reach of the Master Trainers, both within Rwanda and in other countries. Currently, the Master Trainers are leading ongoing research assessing the effectiveness of the breastfeeding interventions, including the WIFD training and the Expert Mothers. Further evaluation of the impact of the training on health outcomes for infants is required, as well as investigation into caregiver views on support received pre- and post-training. Opportunities are also being investigated to integrate WIFD into the World Health Organization kangaroo mother care training, which is well established in Rwanda, to enable more facilities to access the training.

For more information please contact Himali de Silva and Maya Asir at infantfeedingtraining@gmail.com

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¹ MAITS is a charity that aims to improve access to healthcare and education for people with disabilities through training.

² Impact on length of stay and mortality of the training and other interventions is being examined to feature in future peer review publication (and *Field Exchange* summary).

An innovative, low-cost tool for a more efficient weight-for-height/length (WHZ/WLZ) assessment

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Introduction

Early identification and treatment of wasting is an important element in the reduction of childhood mortality and long-term negative health impacts, including stunting. Wasting is diagnosed in children through weight-for-height/length z-score (WHZ/ WLZ) assessments and by measuring mid-upper arm circumference (MUAC). WHZ/WLZ assessment requires three steps, including taking weight and height/ length measurements and looking up the results in tables/charts. Each step is time-consuming and prone to error. For this reason, the World Health Organization does not recommend the use of WHZ/WLZ for the assessment of child nutrition status at the community level.

Some countries, such as Ethiopia, have effectively decentralised management of acute malnutrition services to sites closer to communities. In Ethiopia over 90% of these sites use MUAC to diagnose wasting. MUAC and WHZ/WLZ assessments, however, identify two distinct groups of patients at risk of death and the overlap between the two indicators is very low. For this reason, scholars are asking for innovative solutions that simplify WHZ/WLZ assessments. In response, a new tool has been developed that aims to address some of these drawbacks, thereby minimising errors in WHZ/WLZ assessments and potentially saving health worker time and energy.

The new tool

The new method involves a decision-making calibrated-chart on a height board in place of the usual measuring tape. This chart, called a Y's chart, reduces the steps needed for a WHZ/WLZ assessment from three to two by avoiding the need for separate reference materials (Figure 1).

New height boards were produced with grooved spaces to post the calibrated charts. As an alternative, the graduated charts were also produced as stickers to be attached to existing height boards. As the new charts also have linear measurement markings in centimeters, the placement of the stickers on the existing boards was not difficult when done with due care.

Field testing

To measure potential gains of the new tool, field tests were conducted by four regional state health bureaus in collaboration with USAID Transform: Primary Health Care project between December 2017 and December

2018. A half day's practical training was provided to a total of 16 health workers (clinical nurses and health officers), after which half used the standard method and half used the new tool to measure WHZ/WLZ in a group of 195 children. 'Time saved' and 'proportion of errors committed' were measured and compared between groups. Four community health extension workers (HEWs) were also trained on the new method and conducted WHZ assessments as a separate group. A pair of anthropometry experts reassessed the same children as normal, with moderate acute malnutrition (MAM) or with severe acute malnutrition (SAM) and their assessment was taken as gold standard. The amount of time spent on each WHZ assessment was measured by data collectors.

Results showed that the assessment took an average of 77 seconds to conduct with the standard method and 44 seconds with the new method. A total of 154 children were reassessed by experts. The proportion of errors committed by health workers who used the standard method versus new method was 11.6% and 4.4% respectively. HEWs who used the new method committed 7.3 % errors in classifying children as normal, MAM and SAM.

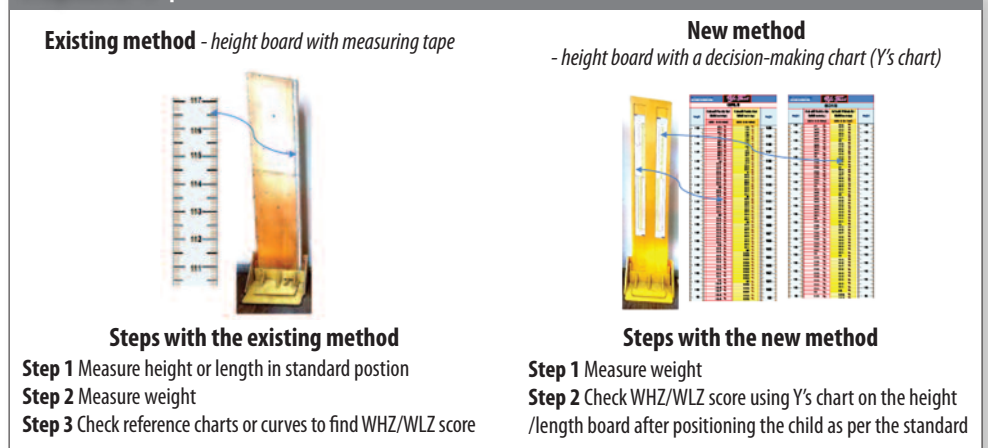
Conclusion and recommendation

The new tool was found to be more efficient, saving 33 seconds per assessment ($p < 0.001$). This is a 43% reduction of time and energy and is a significant gain, especially for busy health facilities. The new tool also produced less errors. However, as prevalence of malnutrition is low, a larger sample study is needed to make definitive conclusions. A randomised clinical trial is currently underway (clinicaltrial.gov, ID: NCT03780348) to investigate potential gains in accuracy. The new tool was also effectively used by community HEWs, indicating its potential for community-level use.

The health bureaus in the four most populous regional states in Ethiopia have endorsed the tool and it is currently in use in 100 health facilities. The feedback from health workers in these facilities is consistently positive. Multi-country testing for its introduction into global practices is recommended.

For more information, please contact Yared Abebe at yared_abebe@et.jsi.com

Figure 1 Venn diagram visualising discrepancies between cGAM, GAM per WHZ and GAM per MUAC



Nutrition Exchange (NEX) South Asia: Maternal nutrition



In its first-ever regional issue, *Nutrition Exchange* has partnered with the United Nations Children's Fund (UNICEF) Regional Office of South Asia (ROSA) to build on the momentum from the 'Stop Stunting: the Power of Maternal Nutrition' conference held in Nepal in 2018. Nutrition is high on the political agenda in South Asia, with many countries having developed and resourced multi-sector nutrition plans to meet global targets on child stunting, wasting and overweight. However, there is a danger that women will be left behind in the regional momentum to improve nutrition unless greater attention is given to their nutritional care.

The nutritional status of women is improving in South Asia, but progress is uneven and slow. One in five women is underweight (body mass index $<18.5 \text{ kg/m}^2$); one in 10 are of short stature (height $<145 \text{ cm}$); and anaemia is a severe or moderate public health problem in seven out of eight countries (UNICEF-WHO, 2019). Meanwhile, the prevalence of overweight is increasing at an alarming rate in women and now exceeds underweight in all countries in the region, except Bangladesh and India.

The focus of the issue was to share the experiences and lessons learned from national government stakeholders and their development partners on how they are improving maternal nutrition at country and sub-national level, and what challenges remain. *NEX South Asia* contains nine articles from seven countries (Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka), providing a range of different contexts. Each country is at a different stage of development in terms of maternal nutrition policies and programmes, and has adopted varying approaches to strengthening its maternal nutrition services.

One of the predominant themes to emerge from the articles was the emphasis placed on nutrition counselling; particularly as delivered via community-based actors and platforms. This is very much in line with World Health Organization (WHO) global guidance (WHO, 2016). In **Afghanistan**, the creation of a new cadre of nutrition counsellors at health-facility level is resulting in increased interaction with pregnant woman and new mothers, despite the ongoing security challenges (Maroof et al, 2019).

Two articles from **Nepal** explored the role of the country's large workforce of female community health volunteers (FCHVs). This role was seen as crucial to the country's success story in reducing the prevalence of maternal anaemia through the work of the FCHVs in promoting iron and folic acid uptake (Bichha et al, 2019). A second article from **Nepal** highlights efforts to strengthen the integration of maternal nutrition activities into the health system with support from a development partner. The focus was on social and behaviour-change communication strategies and capacity-building of the FCHVs to deliver these activities (Pun et al, 2019).

The Indian states of **Bihar** and **Uttar Pradesh** have addressed building the technical capacity of health practitioners at all levels, including medical training for doctors and midwives, to improve the quality of maternal nutrition-counselling services (Ghosh et al, 2019). Having showcased the importance of this training, there are plans to scale up to other states in the country.

Lack of data and information on the coverage and quality of services is another theme that features in a number of articles. In **Bangladesh**, a deliberate focus on prioritising indicators for ma-

ternal nutrition and strengthening the country's nutrition information system has led to an increase in the resources available for scaling up services for pregnant women (Rahman et al, 2019). However, in **Pakistan**, there are ongoing constraints due to the lack of quality data (Ahmed et al, 2019). And, even in countries with a strong enabling environment for maternal nutrition, such as **Bhutan**, the article emphasises that work is still needed to improve programme coverage and quality (Dzed et al, 2019).

Public-sector services such as health are decentralised in a number of the featured countries, which can offer opportunities to both integrate with other sectors and add new activities within sectors. In **Punjab province, Pakistan**, overlapping programmes and interventions for maternal and child health have been combined under one umbrella programme for an integrated health-sector response (Ahmed et al, 2019). Challenges remain, however, to involve other sectors, despite the existence of multi-sector mechanisms at provincial level. In **Karnataka state, India**, state-level resources under the Anganwadi services scheme are being used to deliver a hot mid-day meal as part of the health-service provision for pregnant women, with the aim of increasing their calorie intake and uptake of services such as counselling and antenatal care (Mahadevan et al, 2019).

Finally, **Sri Lanka** is one of the few countries in the region with maternal nutrition policy and programming that is attempting to address the new reality of double burden among women (Nilaweera et al, 2019). It is doing this through the counselling of pregnant women to promote healthy eating and physical activity to prevent excessive weight gain. However, challenges remain; in particular, with a blanket supplementation distributed to all pregnant and lactating women. This programme was originally introduced to address undernutrition, but now needs to adopt a targeted approach in light of increasing obesity and overweight.

The second NEX South Asia issue is due out in June 2020. This issue will focus on country articles on complementary feeding, following the 'Stop Stunting: Improving Young Children's Diets in South Asia' conference in Nepal, 2019.

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SPRING through the seasons



The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project has now closed. SPRING was funded by the United States Agency for International Development (USAID), under a seven-year cooperative agreement, and implemented by a team of experts from JSI Research and Training Institute Inc, Helen Keller International (HKI), the International Food Policy Research Institute (IFPRI), Save the Children, and the Manoff Group. SPRING's goal was to strengthen global and country efforts

to scale up high-impact nutrition practices and policies to prevent stunting and maternal and child anaemia in the first 1,000 days. In its lifetime, SPRING supported hundreds of institutions, shared thousands of resources, hosted 100 events and trained more than 168,000 people in nutrition¹, fostering many diverse, multi-sector partnerships for governments and local partners to build on. Although the project has closed, SPRING's website remains available. Much of the learning related to critical nutrition-specific and nutrition-sensitive topics has been documented

and is available in a specially curated section of SPRING's website.²

A JSI-led consortium is now being established to implement USAID's flagship global multi-sector nutrition programme. The launch of the programme will be announced in due course.

Visit: www.spring-nutrition.org

¹ www.spring-nutrition.org/results-glance

² www.spring-nutrition.org/six-years-multi-sectoral-learning-spring

Health systems strengthening course

A health systems strengthening (HSS) course, originally developed to equip United Nations Children's Fund (UNICEF) staff by UNICEF with the University of Melbourne and the Nossal Institute for Global Health, is now open access. The course is aimed at middle and high-level health

professionals, including health administrators and policy makers, doctors, nurses and others who work to shape health systems. Students explore the complexity of health systems and apply systems thinking to HSS in low- and middle-income country contexts. Students are taught to critique major health system frame-

works, analyse health system inequities, and interrogate the evidence for HSS approaches. The course aims to equip learners with knowledge and skills to develop HSS interventions across areas such as health policy, health financing, human resources, supply chain management, quality of care and private sector engagement. The course is freely available and requires three hours of study per week for eight weeks.

Find out more and sign up at: www.futurelearn.com/courses/health-systems-strengthening

Continuity of care in acute malnutrition treatment in East Africa and West and Central Africa: a mapping exercise

An article featured in *Field Exchange* issue 60¹ shared findings of two mapping exercises undertaken by ENN in East Africa and West and Central Africa to gain insight into the continuum of UN-supported service provision for acute malnutrition treatment. While good examples of continuity of care were found in both regions, in general there were considerable shortcomings reflected in what data was available and experiences shared. Contributing factors included different targeting strategies and coverage ambitions for services, variable integration within national systems, lack of normative guidance for moderate case management, and resource shortfalls. Recommendations are consistent across both regions and include more in-depth reviews of service availability and alignment in multiple contexts, product supply chain, referral systems and practices, and protocol adaptations.

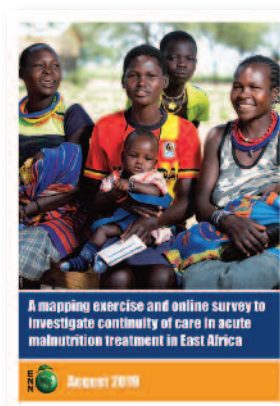
The full reports of both mapping exercises are available on ENN's website.

East Africa: www.ennonline.net/resources/mappingexerciseeafrica

West and Central Africa
www.ennonline.net/resources/mappingexercisewestcentralafrica

For more information, please contact Marie McGrath at marie@ennonline.net

¹ <https://www.ennonline.net/fex/60/sammamapping>



Estimating 'people in need' from combined GAM in Afghanistan

By Alexandra Humphreys, Bijoy Sarker, Baidar Bakht Habib, Anteneh Gebremichael Dobamo and Danka Pantchova



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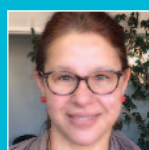
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Taking MUAC measurement of a small child, Afghanistan, 2016

Danka Pantchova, Action Against Hunger

Location: *Afghanistan*

What we know: The correlation between weight-for-height z-score (WHZ) and mid-upper arm circumference (MUAC) prevalence varies by context; this has implications for programme caseload projections.

What this article adds: The proportions of global acute malnutrition (GAM) and severe acute malnutrition (SAM) cases among children aged 6-59 months in Afghanistan captured by different indicators (WHZ, MUAC and a proposed aggregate indicator (cGAM)) was determined. Anthropometric databases from 31 SMART surveys from 30 out of 34 provinces (2015-2018) were used, totalling 28,301 children. Only 25.7% of GAM cases and 14.7% of SAM cases met both WHZ and MUAC criteria. Numbers of GAM cases identified were: 2,936 (WHZ); 3,068 (MUAC); and 4,777 (cGAM). Caseloads for SAM were: 814 (WHZ); 751 (MUAC); and 1,364 (cSAM). Three caseload calculations were performed in 22 priority provinces based on WHZ, MUAC and cGAM to compare the differences. The caseload estimate was 1,021,039 by WHZ; 1,090,620 by MUAC; and 1,578,465 by cGAM. Poor correlation between WHZ and MUAC in the Afghanistan context necessitates use of cGAM to estimate caseloads. The authors recommend that cGAM is routinely reported from population-representative nutrition surveys globally, in addition to WHZ and MUAC, to enable context-specific decision-making. Globally validated cut-offs for cGAM are needed.

Background

The World Health Organization (WHO) recommends the use of weight-for-height z-score (WHZ) to estimate prevalence of global acute malnutrition (GAM), also referred to as wasting, among children aged 6-59 months (WHO and UNICEF, 2009). Population WHZ is compared against the 2006 WHO growth standards for boys and girls. Individual cases with WHZ ≥ -3 and < -2 are categorised as moderate acute malnutrition (MAM), while WHZ < -3 cases are categorised as severe acute malnutrition (SAM). WHO also recommends the use of mid-upper arm circumference (MUAC) as an independent diagnostic criterion (WHO and UNICEF, 2009). MUAC relies not on sex-specific growth references, but on a global cut-off indicating severity; MUAC ≥ 115 mm and

< 125 mm is categorised as MAM, while cases with MUAC < 115 mm are categorised as SAM.

WHZ and MUAC are generally presented independently in SMART¹ and UNHCR Standardised Expanded Nutrition Surveys (SENS) to estimate the prevalence of acute malnutrition, since it is well established in the literature that WHZ and MUAC correlate poorly (Roberfroid *et al*, 2015). A 2018 analysis of 744 population-representative surveys from 41 countries concluded that the prevalence of acute malnutrition by WHZ and MUAC varied considerably, even within the same region and country, while the prevalence of global acute malnutrition GAM by WHZ was higher than GAM by

¹ Standardized Monitoring and Assessment of Relief and Transitions



A girl being measured for height, Kandahar, Afghanistan, 2018

Alexandra Humphreys, Action Against Hunger

The humanitarian programme cycle (HPC) is a coordinated series of actions undertaken to help prepare for, manage and deliver humanitarian response. The critical first step of the HPC is the humanitarian needs overview (HNO), which helps to inform strategic response planning. During the process of HNO development, each sector cluster calculates its estimated caseload requiring humanitarian assistance, known as the 'people in need' (PiN) estimation. In Afghanistan, the PiN is calculated in advance of each year in alignment with the Afghanistan multi-year Humanitarian Response Plan (HRP) strategy. Previously, caseload calculation in Afghanistan had relied on malnutrition estimates based on WHZ. With the frequent observations that the prevalence of acute malnutrition by MUAC was higher in most provinces than WHZ, nutrition stakeholders began advocating for both indicators to be considered in PiN estimates.

Methods

An analysis of the proportions of GAM and SAM cases among children aged 6-59 months in Afghanistan captured by different indicators (WHZ, MUAC, cGAM) was performed. Data cleaning and analysis was conducted using STATA Version 15. The anthropometric databases from 31 SMART surveys supported by Action Against Hunger between January 2015 and September 2018 were appended to create a complete database of children aged 6-59 months. During the data cleaning process, observations were systematically excluded from the dataset, as only children with both MUAC and WHZ data were retained for analysis. Eighty-one observations were removed due to missing MUAC data. Thirty observations were removed due to missing WHZ data, including cases of oedema (9)³. Due to the assumed heterogeneity of the sample of nationwide data, the data were assessed using WHO flags (+/- 5 standard deviations from the mean ($\mu=0$)) in order to exclude outliers based on biological implausibility. Seventy-four observations were flagged as outliers per WHO flags and removed from the dataset. Overall, 185 (0.6%) observations were removed from the dataset. The final analysis assessed 28,301 children aged 6-59 months.

Children categorised as GAM by WHZ (<-2 z-scores) were cross-tabulated against children categorised as GAM by MUAC (<125 mm) to examine the relationship between the two indicators. The same method was conducted to compare SAM by WHZ (<-3 z-scores) and SAM by MUAC (<115 mm).

Separately, to compare the difference in caseload calculations based on the different anthropometric indicators (WHZ, MUAC and cGAM), three separate caseload calculations were performed using Excel 2016 following the method developed by the Global Nutrition Cluster (GNC):

$$\text{Caseload} = N \times P \times K$$

where N=population size,
P=prevalence of malnutrition,
K= correction factor

Twenty-two priority provinces were used for calculation, with the Nutrition Cluster in Afghanistan defining a province as priority if it has a GAM prevalence by WHZ $\geq 10.0\%$. The population size (N) was derived from the 2018-2019 population estimates available from the Central Statistics Organization (CSO) of Afghanistan. The estimated prevalence of acute malnutrition (P) by WHZ, MUAC and cGAM per province was sourced from the most recent SMART surveys. Lastly, a correction factor (K) of 2.6 was used per GNC recommendations for calculating nutrition caseload for a year.

Results

The anthropometric data were examined from 31 population-representative, cross-sectional SMART surveys conducted across 30 of the 34 (88.2%) provinces of Afghanistan from 2015 to 2018, suggesting a sample reflecting all regions of the country. The sample was 48.6% female and 51.4% male. The age ratio of children aged 6-29 months compared to children aged 30-59 months was 1.03 (higher than the expected proportion of 0.85⁴).

Overall, there were 2,936 cases of GAM per WHZ and 3,068 cases of GAM per MUAC, as presented in Figure 1. Despite a similar number of cases using either indicator, there remains a large discrepancy in cases captured by both, with only 25.7% of cases identified as GAM according to both indicators. More GAM cases were identified using MUAC than WHZ; however, using MUAC alone would capture only 64.2% of cases. Alternatively, using WHZ alone would capture just 61.5% of these cases. Considering cGAM (WHZ and/or MUAC), there were a total of 4,777 GAM cases.

Overall, there were 814 cases of SAM per WHZ and 751 cases of SAM per MUAC, as presented in Figure 2 below. Despite a similar number of cases using either indicator, there remains a large discrepancy in cases captured by both, with only 14.7% of cases identified as SAM according to both indicators. More SAM cases were identified using WHZ than MUAC; however, using WHZ alone would capture only 59.7% of cases. Alternatively, using MUAC alone would capture just 55.1% of these cases. Considering cSAM (WHZ and/or MUAC), there were a total of 1,364 SAM cases.

The results of the caseload calculation based on three scenarios presented in Table 1 demonstrate the difference in caseloads based on WHZ, MUAC and cGAM. All three scenarios examined the same 22 priority provinces, thereby utilising the same total population and total population under five years old data, while examining a different prevalence of malnutrition per province based on the indicator. As expected, the caseload estimate by WHZ was the lowest, with an estimated

MUAC approximately 75% of the time (Bilukha and Leidman, 2018). WHZ is standardised for sex and height (and thus indirectly for age). Recommended global MUAC cut-offs are not standardised for sex, height, or age and tend to identify younger and stunted children (Grellety and Golden, 2016, Roberfroid et al, 2015). The potential for WHZ and MUAC to capture different children is why they are reported separately and used independently as enrolment criteria for the treatment of acute malnutrition among children aged 6-59 months. However, the discrepancy between WHZ and MUAC, and how this can affect overall caseloads, is rarely considered at field level for programmatic purposes.

Countries adopt different approaches towards individual detection and enrolment criteria for acute malnutrition management according to the context. In Afghanistan, population-representative anthropometric SMART surveys have suggested a distinct discrepancy between the prevalence of GAM by WHZ and MUAC, with the prevalence by MUAC being higher in most surveys. The Integrated Management of Acute Malnutrition National Guidelines² (January 2018) recommends the use of WHZ, MUAC, oedema and clinical status. In order to represent the burden of acute malnutrition among children aged 6-59 months more accurately, Action Against Hunger, with the support of local partners and the Ministry of Public Health Public Nutrition Directorate, began reporting on the prevalence of GAM combining both WHZ and MUAC in 2015. Combined GAM (cGAM) is an aggregated indicator including all cases of GAM by WHZ <-2, MUAC <125 mm, and/or bilateral pitting oedema.

This article examines the practical implications of using cGAM in the Afghan context and considers the implications of using cGAM in settings where WHZ and MUAC are poorly correlated.

² www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/afg_imam_guideline_2018_final.pdf

³ Due to the physiological effects of oedema causing retention of fluid in the body, weight data is not considered for children with nutritional oedema.

⁴ Per the SMART Methodology plausibility check

Figure 1 Venn diagram visualising discrepancies between cGAM, GAM per WHZ and GAM per MUAC

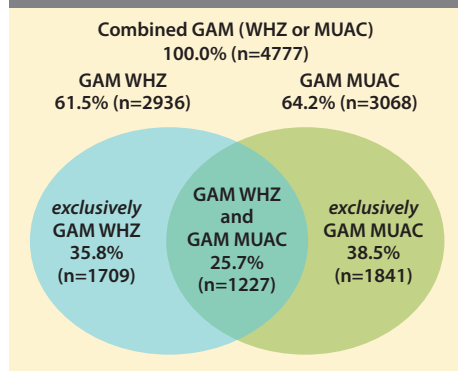
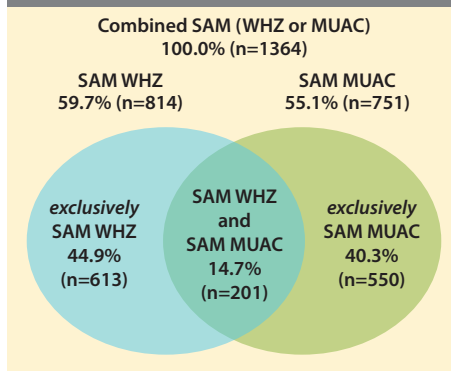


Figure 2 Venn diagram visualising discrepancies between cSAM, SAM per WHZ and SAM per MUAC



1,021,039 children under five years old acutely malnourished. The caseload estimate by MUAC was higher, with an estimated 1,090,620 children under five years old acutely malnourished. The caseload estimate by cGAM was the highest, with an estimated 1,578,465 children under five acutely malnourished (UNOCHA, 2018).

Discussion

WHZ and MUAC are currently used independently to assess acute malnutrition among individual children as well as the overall population of children aged 6-59 months. Both methods possess strengths and weaknesses, leading to their potential to capture different subsets of children. In the Afghan context, the higher proportion of children identified using MUAC prompted humanitarian practitioners to investigate how many children were being captured by both indicators. This analysis demonstrates that there is a large discrepancy between cases of acute malnutrition identified by WHZ and MUAC in Afghanistan, with only one in four children being captured by both indicators.

These findings have important implications for estimating the burden of acute malnutrition. Traditionally, most countries have relied on the prevalence of WHZ for caseload calculation as it is standardised for age and sex and tends to generate a higher prevalence than MUAC; often perpetuating the assumption that, because it is a larger prevalence, it also captures and accounts for the children who are acutely malnourished by MUAC. The poor correlation between WHZ and MUAC as demonstrated in recent literature,

in addition to the results of this analysis, supports the argument that cGAM should be routinely calculated and reported by countries to recognise any discrepancy between the two indicators.

There are also programming implications for countries or regions that rely exclusively on MUAC as a criterion for enrolment into a programme for the treatment of acute malnutrition. Using only MUAC can exclude the portion of the population aged 6-59 months that would be eligible only by WHZ, who are more likely to be older children considering MUAC's known bias towards identifying smaller and younger children. Depending on the discrepancy between the two indicators for the context, a sizable portion of the eligible children could be excluded from treatment. In Afghanistan, MUAC is mainly used for community-based screenings, increasing the likelihood that a portion of acutely malnourished children is missed altogether.

The Afghanistan national Integrated Management of Acute Malnutrition (IMAM) guideline includes both WHZ and MUAC as independent admission criteria for SAM and MAM treatment centres. Practically, this means that any child under five years old with WHZ <-2 and/or MUAC <125mm should be referred to a nutrition centre for appropriate malnutrition treatment and care. WHO recommends that, to improve planning, the same criteria used for admission into programmes should be used for estimating caseload (WHO and UNICEF, 2009). Accurate caseload calculation is crucial in planning the appropriate resources to meet the needs

of this vulnerable subset of the population. Ultimately, planning based on cGAM is both viable and important in the Afghan context, with the Public Nutrition Directorate, the Ministry of Public Health and the Nutrition Cluster having endorsed the practice to ensure realistic forecasting and programme implementation. Yemen has also adopted combined GAM for caseload calculation since 2017 as part of its national guideline.

Given the discrepancy between WHZ and MUAC in the Afghan context, the use of cGAM for caseload calculation is necessary to accurately estimate the burden of acute malnutrition. As contrasted in the three scenarios, using cGAM estimated 1.58 million acutely malnourished children under five, while using MUAC estimated 1.09 million (30.9% less) and WHZ estimated 1.02 million (35.3% less). In other words, relying on WHZ caseload estimations alone for 2019 could have overlooked the necessary advocacy, resources, planning and programming for half a million cases of acute malnutrition; one in every three wasted children under five in Afghanistan.

Recommendations

Given the evidence presented, it is recommended that cGAM be routinely reported from population-representative nutrition surveys globally. Reporting cGAM should not replace but complement the reported prevalence of acute malnutrition by GAM by WHZ and GAM by MUAC to enable nutrition stakeholders to utilise any of the three indicators for decision-making as is most appropriate for their context. cGAM should also be considered for use in calculating caseload, particularly in contexts where GAM by WHZ and GAM by MUAC are poorly correlated. Considering that there are globally validated cut-offs for GAM by WHZ as well as GAM by MUAC, global nutrition leaders should establish a globally validated cut-off for cGAM for better interpretation of findings by nutrition stakeholders and decision-makers.

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Table 1 Three scenarios for Afghanistan 2019 HNO caseload estimation among 22 priority provinces (2018-19 SMART survey data)

Scenario	Total Population (2018)	Total US population (17.3%)	GAM (range)*	SAM (range)	Total # of MAM (US)	Total # of SAM (US)	Total # of GAM (US)
Scenario 1: WHZ**	17,773,741	3,074,857	(10.4% to 15.7%)	(1.4% to 4.2%)	783,201	237,838	1,021,039
Scenario 2: MUAC			(6.4% to 24.4%)	(1.3% to 7.4%)	789,370	301,250	1,090,620
Scenario 3: cGAM			(14.4% to 26.9%)	(2.7% to 8.4%)	1,122,626	455,839	1,578,465

*Range of acute malnutrition prevalence across the 22 priority provinces
 **WHZ data was available for children aged 0-59 months. MUAC and cGAM data was only available for children aged 6-59 months (as MUAC is not a validated indicator for infants <6 months) and the results were generalised to the entire under-five population.



Ensuring pregnancy weight gain: An integrated community-based approach to tackle maternal nutrition in India

By Sreeparna Ghosh Mukherjee, Pia Sen and Dr Nagma Nigar Shah



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The authors acknowledge the support of the CINI in the implementation of this project, as well as HCL foundation (funding partner) and the Department of Health and Family Welfare and the Department of Women and Child Development of the Government of West Bengal.

Location: *India*

What we know: Maternal nutrition is a critical determinant of maternal health and the nutrition, health and wellbeing of children.

What this article adds: In 2018, Child in Need Institute implemented a pilot maternal nutrition project in 98 government integrated child development services centres in three districts of West Bengal, covering 182 pregnant women. Frontline health workers were trained to identify pregnancies as 'nutritional risk', including thin, severely thin, overweight, obese and anaemic. Routine food provision (daily cooked meal), iron-folic acid supplementation and nutrition counselling were strengthened. Participants were weighed monthly. Fifty per cent of participants were malnourished at registration (30.3% severely thin or thin; 19.7% overweight or obese). Average gestational weight gain (GWG) was 9.36 kg (against 10 kg target in line with national guidelines) and was highest in undernourished women. Prevalence of anaemia reduced by 12% by the end of pregnancy, with most improvement in normal body-mass-index women. Rate of low birth weight among infants born of the cohort was 16%; 90% of whom were from severely thin and overweight/obese mothers. Recommendations are to identify pregnancies at nutritional risk by 12 weeks for targeted nutritional support; monthly routine tracking of GWG; improved adherence to government pregnancy supplementation programmes; and improved guidance on community-based maternal nutrition interventions targeted to different risk categories.

Background

India has the highest number of malnourished children in the world. In 2015, an estimated 37.9% of children under five years old in India were stunted and 20.8% wasted (India DHS, 2015). The health and nutrition of a mother is a major contributory factor to the nutrition of her child throughout the lifecycle (Black et al, 2008; Victora et al, 2008). An undernourished mother is more likely to give birth to a low birth weight (LBW) infant, which increases that child's risk of wasting, stunting and child mortality and, later in life, their risk of non-communicable diseases such as diabetes and high blood pressure. Stunting in childhood also leads to lower educational achievements and, for girls, increases the chances of them growing into women who will give birth to smaller infants themselves, perpetuating the intergenerational cycle of malnutrition (Victora et al, 2008). In one study, nutrition support pro-

vided to pregnant mothers and their children up to the age of three was associated with an 11% increased chance of that child acquiring a graduate degree, compared to children who received nutrition support between the ages of three and six (Nandi et al, 2008). Optimal maternal health and nutrition are also important for a woman's own ability to lead a healthy life.

India's maternal mortality rate remains high, at 130 per 100,000 live births. This must be halved within the next decade to reach the sustainable development goal. Furthermore, India has one of the highest prevalences of anaemia among pregnant women in the world, at 53.2%. Uptake of iron and folic acid (IFA) supplementation among women of childbearing age in India is low (28% in West Bengal; NFHS-4 2015-16), despite widespread distribution, due to apathy and common side-effects of nausea and vomiting. This is aggravated by a lack of di-

etary diversity in regular food consumption, tending towards high consumption of starchy foods (rice and potatoes in West Bengal).

Child in Need Institute (CINI)¹ has been working in child, women and adolescent health and nutrition in India for 45 years. In 2017, CINI, with support from the HCL Foundation², initiated a maternal and child nutrition project in three districts of West Bengal, focusing on the first 1,000 days (conception until two years of age). The aim of the project is to change community-level practices to tackle malnutrition by facilitating stronger links between existing government services and recipients in the community.

Pilot maternal nutrition intervention

As part of this project, a pilot maternal nutrition

¹ www.cini-india.org

² www.hclfoundation.org



Team building game with communities and frontline workers, West Bengal, 2018

intervention was implemented between April 2018 and February 2019 to facilitate adequate pregnancy weight gain and anaemia control in three blocks in three districts of West Bengal: Nagrakata block from Jalpaiguri district; Suti-I block from Murshidabad district; and Falta block from South 24 Parganas district. The pilot intervention was implemented in 98 integrated child development services (ICDS)³ centres across these locations. ICDS centres cover a population of 500-700 and were selected rather than sub-health centres as the delivery platform as they are more accessible to the community. ICDS centres were selected in discussion with the block administration based on social group (higher concentration of scheduled caste/scheduled tribe/Muslim population); geographical accessibility (hard-to-reach areas); high prevalence of child malnutrition; and the presence of population pockets currently underserved by ICDS centres.

Selection of participants

All women in their first trimester of pregnancy during May 2018 from all 98 ICDS centres were included in the intervention, with no exclusions

(n=210). Over time, there were instances of miscarriage, abortion and migration, reducing the final cohort to 182. The intervention involved the pregnant women and their families, plus 221 frontline health workers (FHWs), including all auxiliary nurses/midwives (ANMs), accredited social health activists (ASHAs) and ICDS workers in the 98 ICDS centres and 47 sub-health centres covering them.

Intervention strategies

The intervention was implemented using an integrated community-based approach that emphasised home-based care and timely utilisation of government health and nutrition services by participants. Key strategies included:

Strategy 1: Identification and follow-up of pregnant women 'at nutritional risk'

A pregnancy is considered 'at nutritional risk' if there are any nutritional deficiencies that can affect the pregnant woman's health and the health of her child (both during pregnancy and the post-pregnancy period). According to the maternal nutrition services package in India,⁴ pregnancies are classified either as 1) not at nu-

trition risk (normal body mass index (BMI): 18.5-22.9, India classification); 2) at nutritional risk but no medical risk (as assessed by ANMs); or 3) at both nutritional and medical risk.

A pregnancy is also considered 'at nutritional risk' when at least one of the following indicators is present:⁵

- a) BMI (taken <20 weeks gestation) identifies woman as severely thin, thin, overweight or obese (Table 1);
- b) Age of pregnancy (below 20 and above 35 years);
- c) Body weight at the time of registration (40 kg or less);
- d) Height (less than 145 cm);
- e) Anaemia (severe anaemia: less than 7 g/dl, moderate anaemia: 7-10.9 g/dl);
- f) Inappropriate gestational weight gain (GWG) (<1 kg /month or >3 kg /month from second trimester onwards).

Under the current regime of pregnancy care in West Bengal, all indicators are measured routinely except for BMI, which makes it more difficult to identify and categorise pregnant women according to their nutritional risk and provide needs-based counselling. This intervention incorporated an initial nutrition and health assessment, including BMI assessment, to define nutritional risk more effectively. Nutrition assessment was initially carried out by the CINI team and later by trained ICDS workers and ANMs.

On identification of pregnancies at nutritional risk, a management plan was tailored to the specific needs of the pregnant woman. This included strengthened existing government interventions and new interventions, as follows:

Strengthened existing interventions:

- i. Increased home contact with pregnant women by the FLWs and CINI team to ensure timely uptake of antenatal check-ups and other services;
- ii. Additional haemoglobin tests for anaemic women and follow-up for IFA supplement consumption;
- iii. Ensuring ultrasonography examination of all women after second trimester (at the block hospital);
- iv. Ensuring fourth antenatal check-up at the ninth month for all women by an ANM (at sub-health centres).

New interventions:

- i. Specific dietary counselling of pregnant women based on their nutritional status;
- ii. Joint counselling of the family members of pregnant women to ensure support and sharing of household work burden;
- iii. Monthly weight monitoring for assessing GWG.

Table 1 BMI cut-offs (taken <20 weeks of pregnancy) to classify pregnant women at nutritional risk⁶

Weight category (recorded <20 weeks gestation)	WHO BMI category (kg/m ²)	Asian BMI category (kg/m ²)
Severe thinness	<16.0	<16.0
Thinness	16.0-18.49	16.0-18.49
Normal weight	18.5-24.9	18.5-22.9
Overweight	25-29.9	23-24.9
Obese	≥30	≥25

³ ICDS is a programme run by government in Indian states which provides supplementary nutrition, pre-school education, primary healthcare, and awareness of immunisation, health check-up and referral services for children under six years of age and pregnant and lactating mothers.

⁴ Maternal nutrition services package (Ministry of Health & Family Welfare (MoHFW), Government of India).

⁵ Ibid.

⁶ Ibid.

Figure 1 Percentage of pregnant women with GWG of 10 kg or more among different BMI categories

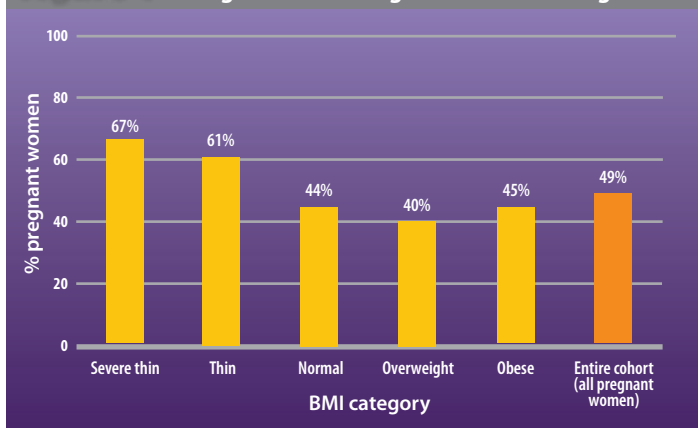
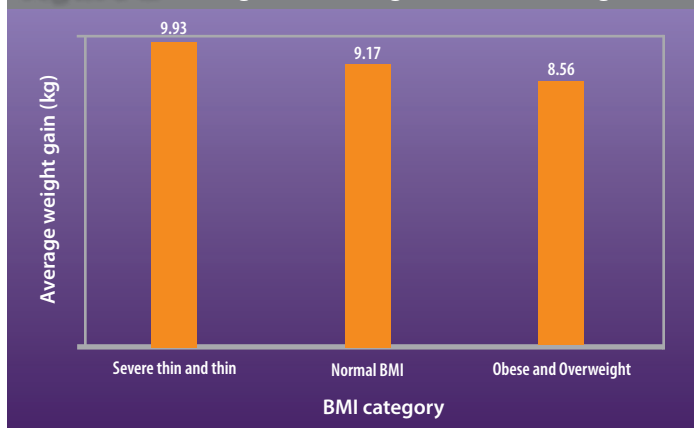


Figure 2 Average GWG among different BMI categories



Additional attention was given to severely thin and thin pregnant women who, together with their family, received additional home visits with repeated counselling on dietary diversity, quantity of food intake and the importance of rest. These women were followed up through home visits to encourage attendance at ICDS centres for daily food supplementation, monthly weighing and adherence to daily IFA supplementation. Those not gaining weight as per government guidelines (2 kg per month or over 3 kg per month from second trimester onwards)⁷ were sent for additional check-ups at the health centre to screen for complications. Ultrasonography was done for all cases in the second or third trimester to understand and detect abnormalities in foetal growth.

Strategy 2: ICDS-based interventions to ensure uptake of services

Certain innovations (not currently implemented in the existing system) were made at ICDS centres to support appropriate GWG, including:

Monthly weight monitoring:

The pregnant women were weighed monthly at the ICDS centre by an ICDS worker and counselled accordingly at that visit, with tailored messages to underweight and overweight/obese women. The routine practice in the state is to weigh pregnant women once per trimester at the health centre. GWG was calculated using the weight at the time of registration and the last weight taken before delivery. A target was set of 10 kg total weight gain during pregnancy, in line with government recommendations of 9-11 kg. International guidelines for GWG are higher, at 12-18 kg during pregnancy (IOM, 2009/WHO); however, studies demonstrate that women in India gain only about 7 kg on average for full-term pregnancy (Coffey, 2015) and reports from block-level officials, FLWs and communities suggest that average weight gain in West Bengal is lower, at around 5-6 kg. The decision was therefore made to lower the target, in line with government guidelines. While international guidelines recommend different levels of total GWG, depending on the pregnant woman's starting BMI (underweight women 12.5-18 kg; overweight 7-11.5 kg; and obese 5-9

kg (IOM, 2009/WHO)), there is no such differentiation in Government of India guidelines and the setting of India-specific differentiated guidelines was felt to be beyond the scope and capacity of this study.

On-the-spot-feeding of supplementary nutrition and IFA supplementation:

In West Bengal, all pregnant women are provided with supplementary nutrition for six days per week from ICDS centres through provision of a hot cooked meal (usually a combination of rice, pulses, vegetables/soya-bean and one egg). This is usually taken home for consumption and shared within the household. To address this and low consumption of IFA tablets, spot-feeding of both supplementary nutrition and IFA tablets at the ICDS centre was implemented. Instead of taking cooked food home, the women were encouraged to stay at the centre to consume their meals, after which IFA tablets were also taken. This ensured that the women's nutritional requirements were met and provided more frequent contact with service providers, and therefore greater opportunities for counselling. Women were initially reluctant to remain at the centre to consume the meal, partly due to lack of infrastructure at ICDS centres to support meal consumption. Repeated counselling helped change this practice in many of the sites.

Strategy 3: Working in an integrated, team-based approach

At the heart of this intervention was the convergence and collaboration of multiple community-level stakeholders to achieve the shared goal of improved pregnancy outcomes. A team was brought together at each centre of workers routinely responsible for the support of pregnant women and their families, including: ICDS workers, ASHAs, ANMs and self-help groups where present. Teams from each of the 98 ICDS centres were gathered for three different orientation workshops. Participative games were used to communicate the importance of team working, coordination and communication, and to unravel various myths and superstitions associated with pregnancy care. Simulation exercises created a sense of ownership and enthusiasm among the team in achieving the common goal together.

Incentives were provided to pregnant women to use all the services available to them in the form of coupons. On complying with each of the services in a timely manner, each pregnant woman received a coupon which also displayed a simple health-awareness message. At the end of the intervention, the pregnant woman and her family with the maximum number of coupons was recognised in front of the community as an example to follow. The best-performing team of FHWs was recognised in a similar way by congratulating team members at a ceremonial event organised by the block health administration. Feedback suggests that the coupons encouraged the families of the pregnant women to engage in the process and provide better support to them. Those provided to ANMs encouraged them to complete all ANC visits up the fourth scheduled visit on time.

Results

Initial assessment of the 182 pregnant women at registration during their first trimester revealed 50% to be malnourished. Of these, 30.3% were severely thin or thin and 19.7% were obese or overweight. Of the 182 women, 41% were married early (below 18 years of age at time of marriage); 16% were teenagers (below 20 years of age); 49% anaemic (haemoglobin levels below 11gm/dl at time of registration of pregnancy); and 70% were defined as having a 'high-risk' pregnancy.⁸

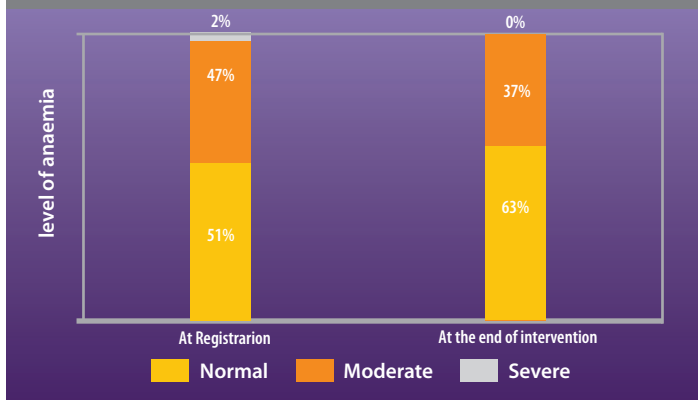
Gestational weight gain

The average GWG of the cohort was 9.36 kg, which is considerably higher than the average GWG of 7%. Sub-analyses by nutritional risk category showed that weight gain of 10 kg or more was higher in undernourished (severely thin and thin) pregnant women (Figure 1), and average weight gain was higher in this group compared to overweight and obese women (Figure 2). This suggests that counselling was appropriately tailored to the needs of the different groups according to their nutritional risk.

⁷ MoHFW maternal nutrition services package advocates for a weight gain of 9-11 kg during pregnancy, with no separate weight gain recommendation for overweight/obese women.

⁸ Indicators for high-risk pregnancy as per Government of India guidelines of ANM handbook. http://164.100.154.238/images/pdf/programmes/maternal-health/guidelines/sba_handbook_for_anm_lhv_sn.pdf

Figure 3 Prevalence of different levels of anaemia of pregnant women at registration and end of intervention



Levels of anaemia

A 12% decrease in prevalence of anaemia in the cohort by the end of pregnancy was observed (Figure 3). Women with normal BMI were more likely to have improved haemoglobin levels (30%, compared to 14% and 22% of overweight /obese and thin/severely thin pregnant women respectively).

Birth outcomes

A high rate of deliveries (98%) took place in institutions (hospitals, nursing homes, etc), compared to the state average of 75.2% (NFHS 4, 2015-16). This can be attributed to intensive counselling and follow-up of the pregnant women and their families. The majority of infants born to intervention women (84%) had normal birth weights (2.5 kg or above); 16% (30 out of 182) of infants were LBW, compared to the prevalence of LBW in West Bengal of 11.5% (DLHS 4). Sub-analyses showed that prevalence of LBW was highest among severely thin and overweight/obese mothers, at 22% and 20% respectively, followed by thin and normal BMI at 15% and 18% respectively (Figure 4). A higher proportion of LBW babies were born to teenage mothers (30%) compared to adult mothers (26%). The prevalence of LBW among mothers with GWG of 10 kg or more was much lower (8%) than those with GWG of less than 10 kg (25%). This may point to the importance of GWG in improving birth outcomes.

Another significant observation was that 90% of LBW infants were born to women with high-risk pregnancies. Among the different categories of high risk, 91% were anaemic, 77% did not gain weight up to 10 kg, and 62% had BMI that indicated malnutrition (undernourished or overweight/obese). This supports the literature that suggests that the prevalence of LBW increases in the case of high-risk pregnancies and low maternal nutrition.

Discussion

Results suggest that the intervention was successful in promoting weight gain among the women who needed it most (thin and severely thin pregnant women) and in reducing prevalence of anaemia among pregnant women. Results also emphasise the importance of focusing interventions on high-risk pregnancies in order to reduce the prevalence of LBW.

The intervention highlights the importance of proactively promoting appropriate weight gain in pregnancy among communities and health workers in India. GWG was rarely regarded as an important criterion for a healthy pregnancy and was not monitored regularly prior to the intervention. Key components that contributed to the success of the programme were collaboration between FLWs, promotion of GWG among FLWs and community members, and strategies to promote compliance among pregnant women to government supplementary nutrition and IFA programmes. Barriers such as distance to centres, lack of space to consume meals and resistance to IFA supplementation were ongoing challenges.

This programme also demonstrates the complex challenges that arise from implementing an intervention in the context of the ‘double burden of disease’, where malnutrition is present in all its forms within the same population (undernutrition and overnutrition, as well as micronutrient deficiencies). The ICDS programme as it exists now provides nutrition supplementation for all pregnant and lactating women with little scope for tailoring according to BMI, although nutrition counselling was successfully tailored to the needs of different nutritional groups in the intervention. National guidance on appropriate GWG according to maternal BMI is critical to inform future interventions.

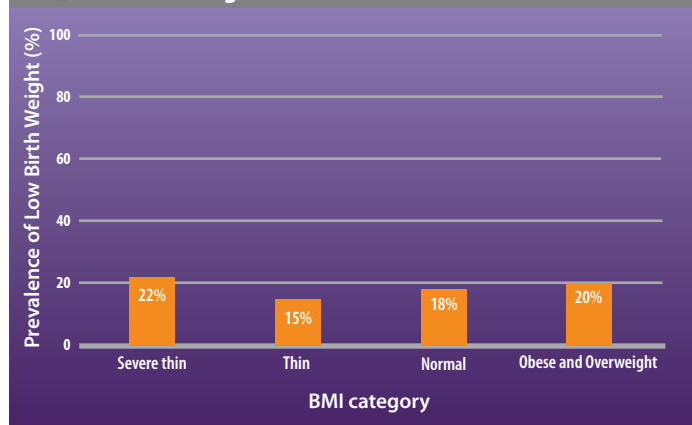
Recommendations

Results of this pilot study call for actions that can be initiated concurrently at policy and implementation levels to promote optimal maternal nutrition:

Early identification of ‘at-nutritional-risk’ pregnancies at the time of pregnancy registration (by 12 weeks gestation) and subsequent follow-ups can help mitigate many risk factors in later pregnancy. BMI screening by ANMs is not routinely carried out in West Bengal for pregnant women and should be made mandatory in all sub-health centres.

Focusing on high-risk pregnancies would help to prevent LBW. However, currently no specific guidelines exist for managing high-risk pregnancies without medical complications at the

Figure 4 Prevalence of LBW among different BMI categories



community level. Guidance on a comprehensive package of community-level interventions to manage high-risk cases is needed.

Prioritising GWG. Monthly tracking of pregnancy weight gain should be integrated into routine systems. Appropriate counselling should be provided for GWG during different stages of pregnancy and for varied nutritional-risk classifications.

On-the-spot-feeding of supplementary nutrition and IFA. On-the-spot feeding at ICDS centres increases nutritional benefits for pregnant women and increases frequency of contact with FLWs and therefore counselling opportunities. This should be explored as an option for increasing adherence in other locations.

Development of a comprehensive package for community-based management of maternal nutrition. In addition to the above, a comprehensive package of interventions for community-level management of maternal malnutrition is needed that includes specific targeted guidance according to nutritional classification (including overnutrition and undernutrition). This will enable tailored programming and enhanced nutritional benefits for pregnant and lactating women in India.

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Dynamics of the nutritional status of children under five years old in northwest Syria

By Bakhodir Rahimov, Tarig Mekkawi and Vilma Tyler



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This survey was conducted and implemented by Physicians Across Continents Turkey (PAC); Dr Katham Saaty, Programme Manager at PAC and Nutrition Cluster Co-coordinator; and Dr Beshr Alkhateeb, Al-Ameen Foundation in northwest Syria. Technical guidance was provided by Mr Hailu Wondim, SMART Emergency Nutrition Assessment Manager, Action Against Hunger – Canada (AAH-CA) and Mrs Lindsay Baker, Regional SMART Advisor. The authors would especially like to thank Mrs Susan Andrew, Child Protection Manager, UNICEF Amman and Mr Tareq Abukhadijeh, Information Management Officer, iMMAP, for designing the child protection module of the SMART survey questionnaire. The survey was implemented with the financial support of the Office for the Coordination of Humanitarian Assistance (OCHA) and UNICEF in Gaziantep.

Location: Northwest Syria

What we know: Adolescent motherhood, associated with early marriage, may contribute to low birth weight and child stunting.

What this article adds: An expanded SMART nutrition survey led by the United Nations Children's Fund (UNICEF) in northwest Syria aimed to examine the association between child marriage and stunting. Consistent with year-on-year trends, wasting prevalence was low and stunting prevalence was high, although there was variation by operational area. Adolescent mothers (under 18 years old) and child marriage were common. Survey method shortfalls meant that the association between stunting and child marriage could not be examined; this should be addressed in future survey design. In conflict situations, child marriage may increase as a coping mechanism; work to build evidence on the problem and the consequences of early marriage in this region is underway across sectors. In the meantime, UNICEF has initiated an integrated health, nutrition and child protection (including disability) emergency programme response, and a surveillance programme to detect cases of family abuse/violence to help prevent child marriage.

Background

United Nations Children's Fund (UNICEF) operations in Syria are divided into two programme areas with changeable borders, depending on military activity: northwest Syria (Idlib Governorate, part of Hama Governorate, and areas united under rural Aleppo and Euphrates Shield); and operational areas in southern Syria (under control of the Syrian Government working out of Damascus). While child wasting is well controlled, stunting prevalence has increased in almost all operational areas of the northwest. The highest prevalence of stunting among children under five years old is observed in the northern Hama Governorate (25.5% in 2019¹) and in Afrin district in Euphrates Shield area (21.8% in 2019). In Idlib, stunting prevalence was 17.4% in 2019 compared with 14.2% in 2017.²

Attention tends to focus on chronic food insecurity, sub-optimal child feeding practices,

chronic infection and non-infectious diseases as the main contributing factors to child stunting. However, reports from non-governmental organisations (NGOs) and other United Nations agencies point to additional causal factors, including poor adolescent nutrition and high rates of early marriage and early pregnancy. To examine the possible association between early marriage (and therefore early pregnancy), a SMART nutrition survey conducted jointly by UNICEF northwest and southern Syria offices was expanded to collect child protection information, including information on child marriage, birth registration and family composition. This article describes main findings and limitations of the survey, how it has informed current programming, and recommendations for the future.

Methodology

The survey was carried out in northwest Syria operational areas during May 2019 using standard

SMART methodology. The SMART regional advisory group for UNICEF Middle East and North Africa (MENA) validated all data collected daily. The quality of the field data was controlled using data plausibility testing. Data from Hama and Idlib operational areas were consolidated with data from rural Aleppo and Euphrates Shield and was also analysed by single operational areas to identify the most nutritionally vulnerable governorate. Eligible households with children under five years old were visited and anthropometry of those children measured. No information was gathered on household children over five years of age. Mothers were interviewed regarding their age at marriage and information was gathered about the birth registration of children under five years old and family composition (single-parent household or mother and father present). Maternal age at marriage was then analysed against nutrition outcomes. A total of 1,233 children (628 boys and 605 girls) aged 6-59 months from 786 households in 63 clusters in Idlib, northern Hama, rural Aleppo, Euphrates Shield and Afrin district were included in the anthropometric measurements. The sample size was representative of the northwest Syria operational area.

Results

Among the sample, the prevalence of global acute malnutrition (GAM), defined as weight-for-height z-score (WHZ) <-2 and/or oedema, was 0.73% (0.4 - 1.3 95% C.I.) and the prevalence of severe acute malnutrition (SAM), defined as WHZ <-3 and/or oedema, was 0.16% (0.0 - 0.7 95% C.I.), with no cases of oedema (Table 1).

¹ The sample size for northern Hama was not representative. The authors provided the data on it to show the vulnerability of the area. Currently, northern Hama is not part of the northwest Syria emergency response.

² Data from the SMART nutrition survey 2017, northwest Syria (not available publicly).

Table 1 Consolidated results of the SMART survey from northwest Syria, May 2019 (wasting: WHZ)

	All n = 1,232	Boys n = 628	Girls n = 604
Prevalence of global acute malnutrition (GAM) (<-2 z-score and/or oedema)	0.7 % (9) (0.4 - 1.3 95% C.I.)	0.2 % (1) (0.0 - 1.2 95% C.I.)	1.3 % (8) (0.7 - 2.5 95% C.I.)
Prevalence of moderate acute malnutrition (MAM) (<-2 z-score and >=-3 z-score, no oedema)	0.6 % (7) (0.3 - 1.2 95% C.I.)	0.2 % (1) (0.0 - 1.2 95% C.I.)	1.0 % (6) (0.5 - 2.1 95% C.I.)
Prevalence of severe acute malnutrition (SAM) (<-3 z-score and/or oedema)	0.2 % (2) (0.0 - 0.7 95% C.I.)	0.0 % (0) (0.0 - 0.0 95% C.I.)	0.3 % (2) (0.1 - 1.3 95% C.I.)

Table 2 Consolidated results of the SMART survey from northwest Syria, May 2019 (stunting: HAZ)

	All n = 1,232	Boys n = 628	Girls n = 604
Prevalence of stunting (<-2 z-score)	19.4 % (239) (16.9 - 22.2 95% C.I.)	20.9 % (131) (17.2 - 25.1 95% C.I.)	17.9 % (108) (15.0 - 21.2 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	14.6 % (180) (12.2 - 17.4 95% C.I.)	16.1 % (101) (12.5 - 20.5 95% C.I.)	13.1 % (79) (10.6 - 16.0 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	4.8 % (59) (3.6 - 6.3 95% C.I.)	4.8 % (30) (3.3 - 6.8 95% C.I.)	4.8 % (29) (3.2 - 7.1 95% C.I.)

Prevalence of GAM was higher in girls (1.3%) than boys (0.2%), but the difference was not statistically significant (p=0.203). The highest GAM prevalence was observed in Idlib Governorate (1.1%), an area greatly affected by intense, ground-level military action, especially in southern areas, a deteriorating food-security situation and limited access to essential nutrition services.

The prevalence of child stunting, defined as height-for-age z-score (HAZ) <-2 was 19.4 % (16.9 - 22.2 95% C.I.) (Table 2). Stunting prevalence was higher in northern Hama (25.5%) compared to other operational areas (which is consistent with the 2015 SMART survey). Figure 1 presents the consolidated results of the SMART survey in 2019 and the dynamics of wasting and stunting among children in northwest Syria starting from 2014. This demonstrates a clear divergence in prevalence and patterns between stunting and wasting (SAM) over time, including 2019. Stunting is prevalent in more than 25% of children, whereas less than 1% of children are

wasted. The proportion of children who are both stunted and wasted was not examined.

Over 45% of women reported their age of marriage as below 18 years (in some cases, below 13 or 14). This may be an underestimate due to high cultural sensitivity regarding child marriage. Unfortunately, it was not possible to examine associations between age of marriage of the mother and stunting in her child due to methodological problems in data collection. SMART surveys only include children under five years old; however, many mothers who were married as children now had children over the age of five. As these children could not be included in the survey, the association between maternal age at marriage and child stunting could not be consistently examined.

Discussion

Results confirm high levels of stunting and low levels of wasting in northwest Syria. Pre-crisis, Syria had very low prevalence of GAM, and interventions at an early stage of the conflict, in-

cluding capacity-building of the screening and treatment of acute malnutrition, worked to prevent the deterioration of the situation. Nutrition surveys (SMART 2014-2019) demonstrate an almost stable plateau of under-five GAM prevalence in the northwest of Syria throughout the crisis, with levels never exceeding 3%. This is in spite of the borders of northwest Syria dynamically changing and continued high rates of movement of internally displaced people (IDPs).

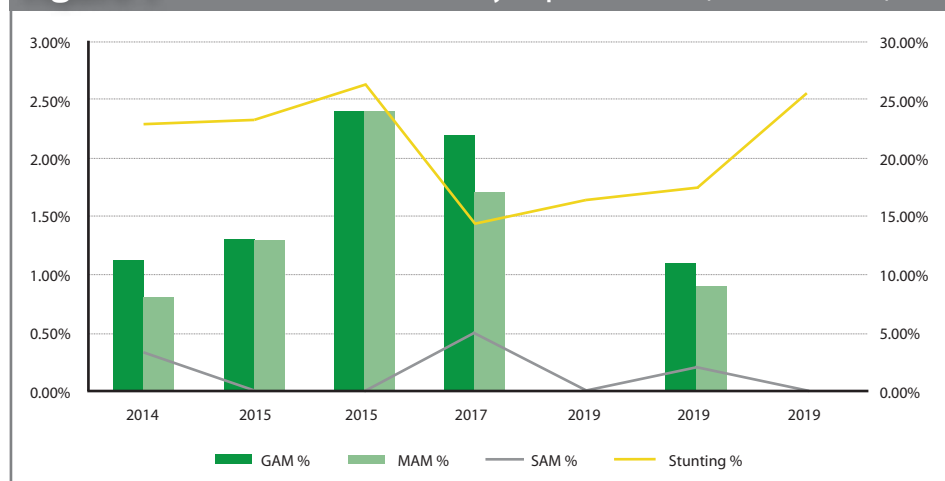
Stunting has risen, however, as indicated by the results of this study. Likely direct causes of this are increased food insecurity, poor access to health facilities and loss of livelihoods resulting in poor quality diets. Sub-optimal infant and young child feeding (IYCF) practices are also an important causal factor. Non-exclusive breastfeeding and poor complementary feeding are widespread in northwest Syria operational areas, both of which likely contribute to high prevalence of child stunting. A 2017 IYCF barriers analysis (no external report available) found that less than 42% of mothers practiced exclusive breastfeeding, due to perceptions of breastmilk inadequacy and lack of family support, and only around 57% of mothers practiced recommended complementary child feeding, with food insecurity cited by mothers as a major constraint to child food diversity. Coverage of IYCF programmes in northwest Syria is low. In particular, there is a lack of availability of one-to-one counselling, partly due to constraints associated with working with IDPs on the move.

Investigations into indirect causes of stunting are also required. Results of this study confirm high levels of child marriage in northwest Syria (45%). This reflects a context where the legal age for marriage is 15 years. NGOs report that, pre-conflict, marriage tended to be deferred until girls had completed high school; however, it is likely that the practice has increased during the conflict. According to the UNICEF Child Protection, Health and Education Clusters of Cross-border Emergency Response programme, child marriage is a common negative coping and protective mechanism during war. There are moves to examine this more closely; for example, information collated by the United Nations Population Fund (UNFPA) Sexual and Reproductive Health Technical Working Group in Gaziantep shows an increase in the number of caesarean sections among mothers below 18 years old compared with the previous five years, which could provide a useful proxy indicator for an increase in child marriage.

The SMART survey 2019 reported here did not measure maternal anthropometry. However, a community surveillance survey demo project conducted in Idlib, Aleppo and Hama governorates found that pregnant and lactating women (PLW) less than 18 years of age (about 12%) all had a mid-upper arm circumference less than 230 mm, a higher prevalence than among PLW over 18 years of age (among whom were higher levels of overweight and obesity). This indicates that adolescent mothers are at risk of undernutrition.

It was not possible to examine the association

Figure 1 Malnutrition trends in northwest Syria operational areas (SMART 2014-2019)



between the age a woman was married and stunting in her children due to limitations of the study. The child protection team required that ages were categorised during data collection, which made it impossible to perform an analysis of the association. There is, however, considerable research that substantiates this link. Adolescent girls are at risk of poor nutrition (in particular anaemia), which increases the risk of their infants having low birth weight, which in turn increases the risk of the infant being stunted in childhood (Soo Hyun Yu, 2016). To date, there has been little scrutiny or research into the relationship between child marriage in northwest Syria and its consequences for adolescent and child health. This is an area that needs more attention to inform interventions.

Conclusions

The nutrition situation in northwest Syria is unique, with high – and, in some areas, increasing – levels of child stunting, alongside declining acute wasting. Reports from NGOs also report increasing rates of child marriage related to the conflict, high levels of which were confirmed in the SMART survey reported here.

Unfortunately, the design of the SMART nutrition survey 2019 did not allow examination of the associations between child marriage and child stunting. Further analysis of the association between child marriage and stunting of subsequent children is warranted, with a better-designed survey to capture the data needed. While we did not statistically confirm the association between child stunting and child marriage, we believe that only a holistic approach can prevent chronic malnutrition and that child protection is a fundamental component that needs to be addressed in this context.

Given this, from July 2019 UNICEF for northwest Syria has been supporting partners to implement an integrated health, nutrition (community-based management of acute malnutrition and IYCF), and child protection (including disability) programme response. Work is ongoing to find ways for the nutrition programme to support the identification of child protection cases, using the nutrition-screening programme as one of the entry points to detect cases of family abuse/violence; this information could enable the instigation of measures to pre-

vent child marriage. Educational programmes may provide another entry point to change community behaviours that sustain child marriage; in particular, to discourage child marriage as a negative coping mechanism for war. Social protection networks for the most vulnerable families and adolescent health programmes are also essential in preventing malnutrition.

To improve the overall nutrition situation, nutrition-specific field interventions aiming to address the immediate causes of undernutrition should be prioritised. Additional supporting mechanisms (such as cash transfers to stimulate adequate and diverse diets, and continuous promotion of optimal IYCF and practices and nutrition behaviours for PLW) should remain core, integrated emergency-response interventions.

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Cost of the Diet analysis in Bria, Central African Republic

By Esther Busquet



Esther Busquet is a Nutrition Advisor with International Medical Corps (IMC), currently supporting the nutrition programmes in the western, central and southern Africa region, as well as providing global support. Before joining IMC, she worked with Save the Children UK, where she was responsible for the Cost of the Diet (CotD) tool for more than two years.

The author would like to thank Marius Rodrigue Koyangbanda Gomassili, IMC Central African Republic (CAR) MEAL Officer, Yewoinshet Adane Berihun, IMC CAR Nutrition Coordinator, Christian Mulamba, IMC CAR Country Director, and the Bria team of IMC CAR for all their contributions and support, and all data collectors and participants in this CotD study for their active participation.

These activities were made possible by a grant from the United States Agency for International Development (USAID) Office of Foreign Disaster Assistance (OFDA).



One of the CotD data collectors weighing sweet potato on the market, Market, Bria, Haute Kotto, CAR

Location: Central African Republic (CAR)

What we know: Dietary habits and food costs are key determinants of a household's capacity to meet energy and nutrition needs.

What this article adds: A Cost of the Diet (CotD) study was carried out among internally displaced persons (IDPs) and host communities of Bria Town and PK3 IDP camp in Haute Kotto region of CAR in November 2018 to determine whether communities could meet energy and nutrient requirements through food assistance (20-day ration) and purchases of locally-available foods. Results show that, for a typical family of nine, a 'nutritious diet' and a 'food habits nutritious diet' (meets energy and nutrient requirements and is acceptable) are both available in the rainy season. However, for poor and very poor families, even meeting basic energy needs is unaffordable. Extending food rations to 30 days, plus the provision of free vegetables (through kitchen gardens and other possible means), would make all diets affordable to all wealth groups. Multisector collaboration and advocacy, including military support for access to insecure areas, is needed to enable this.

Background

In Central African Republic (CAR) an estimated 2.9 million out of a population of 4.6 million currently require humanitarian support. Results of the 2018 SMART survey show a global acute malnutrition (GAM) prevalence of 7.5% and severe acute malnutrition (SAM) prevalence of 2.7% for Haute Kotto region. Aggravating factors include insecurity, food insecurity, high numbers of internally displaced persons (IDPs) in camps and host communities, and poor infant and young child feeding (IYCF) practices. In sites with a high number of IDPs (Alindao, Bambari, Bria, Kaga Bandoro, Batangafo), most households have limited access to land to engage in agricultural activities and are dependent on humanitarian food assistance and food-market purchases. Food



Some of the foods available in Bornou market at the time of the CotD, Bornou Market, Bria, Haute Kotto, CAR, November 2018

and nutrition support are available but patchy due to insecurity and transportation difficulties to the affected areas, and humanitarian food assistance remains inconsistent and underfunded.¹ As a result, food-consumption deficits and poor nutrition among IDPS, returnees and host communities are common. The current food-security situation is classified by the Integrated Phase Classification (IPC) as level 3, crisis.

Bria Town is the capital of Haute Kotto region and the hub of the diamond business in eastern CAR. A series of violent clashes took place in Bria in May 2017 between the FRPC² (commonly called ex-Seleka) and the anti-balaka militia (commonly called Christian militia), resulting in the majority of the resident population moving into PK3 IDP camp,³ just outside the town. The host community and IDPs, resident in either Bria Town or PK3 IDP camp,³ now receive the general food distribution (GFD). Rations provided are for 20 days per month per person by World Food Programme (WFP); insecurity limits the amount of food that can be brought into the region, which hinders the supply of a full 30-day ration. According to the results of International Medical Corps (IMC)'s rapid assessment (RA) in May 2017, in all sites visited, the main sources of foods were the GFD and local markets, which are accessible most of the time. Culturally, it is considered to be the responsibility of the head of the household to provide food for household members. RA focus group discussions (FGDs) revealed that households do not have access to their land to produce the foods typically farmed pre-crisis (cassava, rice and beans), and thus no longer have food stored. This has been exacerbated by the increase in market food prices

during the crisis, with some products, such as sugar, oil and soap, now being very expensive. Tubers, legumes, dairy products, meat and fish, eggs, fruits rich in vitamin A and other vegetables were available in the markets in all sites visited during the needs assessment. However, dairy, meat and fish, and fruit rich in vitamin A were expensive and probably not affordable to most households.

IMC manages primary healthcare, community-based management of acute malnutrition (CMAM) and IYCF and protection programmes in Bria Town and PK3 camp. On the basis of the findings above, to inform future potential food-security activities, IMC conducted a Cost of the Diet (CotD) study to understand if and how IDPs and the host community can meet their energy and nutrient requirements. The ultimate aim of the study was to inform nutrition and food security programming in the area, and influence policy and advocacy processes in this and other similar contexts. Since October 2018 people resident in both the town and camp had access to the same markets, whereas previously IDPs only had access to a smaller market in the camp, with fewer foods available and at higher prices. Thus, the CotD study included both groups.

Study objectives

A CotD study aims to estimate the lowest cost and the quantity and combination of local foods that are needed to provide a typical family with foods that meet their average needs for energy and their recommended intakes of protein, fat and micronutrients. The specific objectives of this CotD study were to: (1) understand the

extent to which economic poverty and typical dietary habits prevent households and vulnerable individuals from consuming a nutritious diet in Bria Town and PK3 IDP camp; and (2) understand if and how IDPs in settings such as Bria Town and PK3 camp can meet energy and nutrient requirements using locally-available foods.

Methodology

CotD training was conducted for nutrition and MEAL⁴ managers in CotD methodology and software (18-26 October 2018). Data collectors in Bria were trained from 31 October to 2 November 2018 and data collection took place between 3 and 9 November 2018. The study involved a market survey, individual interviews and FGDs. The market survey collected data on all food items available in the town's markets, as well as through own food production and wild foods. The price per 100 grams of each food was determined (based on the cost of the lowest-available quantity of each food item). For wild foods, usually gathered at no cost, and foods from own production, the market price was used if the food was sold on the market, and no cost was included if it was not sold on the markets. The composition of several wild foods (mainly fruits) was unknown, so they were not included in the CotD analysis; however, none of these foods were actually available at the time of the study. Individual interviews were conducted with 24 women from several parts of the town and camp to determine the minimum and maximum frequency with which each of these foods was consumed per week. FGDs with the same women helped to generate a better understanding of dietary habits in Bria Town and PK3 IDP camp. Three groups of eight women each participated in the interviews and FGDs; one group from Amameu (PK3 camp), one group from Bornou, and one group from Lasmie (Bria Centre). The groups included adult women from the different wealth groups, as defined by Oxfam's household economy approach (HEA) (Garba, 2015), who were in charge of the household and preparation of meals.

¹ FEWSNET CAR <https://fews.net/west-africa/central-african-republic>

² FRPC = Front Populaire pour la Renaissance de la Centrafrique.

³ PK3 IDP Camp is managed by the Italian non-governmental organisation INTERSOS with funding from United Nations High Commission for Refugees (UNHCR).

⁴ MEAL = Monitoring, evaluation, accountability and learning

Table 1 Percentage of the population of Bria Town per wealth group and family size in Bria Town and PK3 camp per wealth group

Wealth group	Bria Town		PK3 IDP camp*
	Percentage of Population	Family size	Family size
Very poor	40%	3 – 5	2 – 5
Poor	30%	5 – 8	5 – 8
Middle	20%	12 – 15	9 – 12
Better-off	10%	~ 20	--
	100%	'average' ~ 9	

* Percentage of each wealth group among the population in the camp is unknown, but is probably very similar to the percentages for the town, as most IDPs came from Bria Town

Table 2 Details of the lowest-cost nutritious diet and food habits diet for a typical family of nine in Bria Town and PK3 IDP camp in the rainy season

Nutritious diet	Food habits diet
Total of 12 different foods (max 8pp) from 6 food groups (plus breastmilk)	Total of 17 different foods from eight different food groups, including breastmilk
Most difficult nutrients to meet: vitamin B12 and pantothenic acid (contributing relatively most to the total costs of the diet)	Most difficult nutrients to meet: vitamin B12 and pantothenic acid
Out of reach for majority of people, even if the entire salary is used to purchase foods	Even further out of reach for very poor, poor and middle-income families

Figure 1 Diet costs compared to monthly income for a typical family of nine in Bria in the rainy season

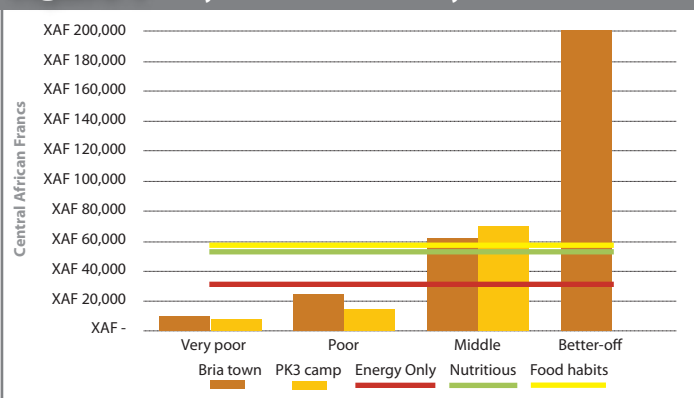
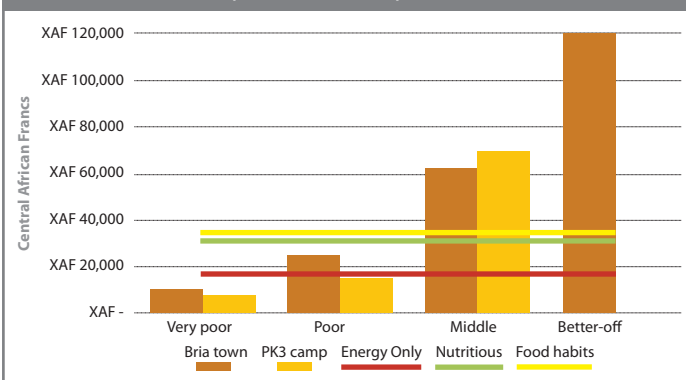


Figure 2 Cost of the diets when a 20-day food basket is provided each month in Bria Town and PK3 camp in the rainy season (current situation)



Based on the information collected, various diets were then calculated using the CotD software, as follows:

- **Energy-only diet:** diet that only meets energy requirements and does not meet (or aim to meet) any nutrient requirements. This is used as a basis for comparison with certain food distribution and food-security programmes;
- **Nutritious diet:** diet that meets requirements for energy, macro- and micronutrients, but does not take into account any dietary habits;
- **Food habits nutritious diet:** diet that meets the requirements for energy, macro- and micronutrients, and takes into account dietary habits.

Based on information from the Oxfam HEA and FGDs with both the data collectors and the women participating in interviews, typical household composition, percentage of the population

per wealth group and average income in both Bria Town and PK3 camp (Table 1) were estimated. A typical family in Bria was found to include nine people. This estimation was used for practical purposes to compare various diet models. A typical family was found to include nine members, as follows:

- 1 child (either sex), 12-23 months old;
- 1 child (either sex), 3-4 years old;
- 1 child (either sex), 7-8 years old;
- 1 child (either sex), 9-10 years old;
- 1 girl, 13-14 years old;
- 1 woman, 18-29 years old, 60kg, moderately active, pregnant 2nd trimester;
- 1 woman, 30-59 years old, 60kg, moderately active, 7-12 months lactating;
- 1 woman, >60 years old, 55kg, moderately active;
- 1 man, 30-59 years old, 65kg, moderately active.

Income for each wealth group was roughly estimated by the team of data collectors and confirmed in the FGDs, but no details on the expenditure of income were checked. In order to get more information on income and expenditure at household level, a new HEA would be needed as the data from the Oxfam HEA in 2015 was considered too old to be used for this CotD. Thus, for this CotD, the results were compared to the entire average income for each wealth group, and not with a part/percentage of income usually spent on food.

Results

For a typical family of nine, a ‘nutritious diet’ and a ‘food habits nutritious diet’ are both available in the rainy season (May/June to October). However, for the poor and very poor families in Bria and PK3 Camp (70% of town, majority of camp population), none of the diets are affordable (Figure 1 and Table 2); these people are unable to meet the ‘energy-only diet’, even when using their entire income.

Table 3 Food rations provided by WFP to people in PK3 camp and Bria Town

Food item	Daily ration (gram/day/person)	# of days per month ration is provided	Total provided per person per month (gram)	Total available per person per day when spread over entire month (gram/day/person)
Rice	300	20	6000	200
Beans	60	20	1200	40
Vegetable oil	20	20	400	13.33
Supercereal	20	20	400	13.33
Salt	5	20	100	3.33
For all children aged 6-23 months in PK3 camp:				
CSB++	100	30	3000	100

‘What if?’ modelling

The CotD software can help to model certain interventions to see how the gap between income and costs for a nutritious diet could be bridged. It can also take account of an available food basket, as is the case in both Bria Town and PK3 IDP camp. The following models show the actual situation in Bria Town and models that could bridge (part of) the gap between nutrient needs and income.

Figure 3 Costs of the diets if a 30-day food basket were to be provided each month in Bria Town and PK3 camp during the rainy season

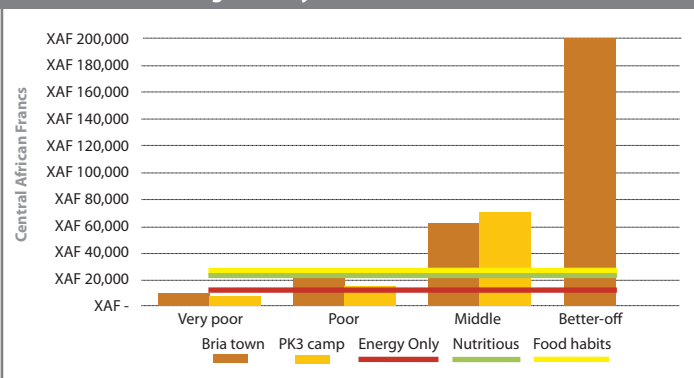


Figure 4 Costs of the various diets compared to monthly income when vegetables are available through kitchen gardening for a typical family of nine in Bria Town, rainy season

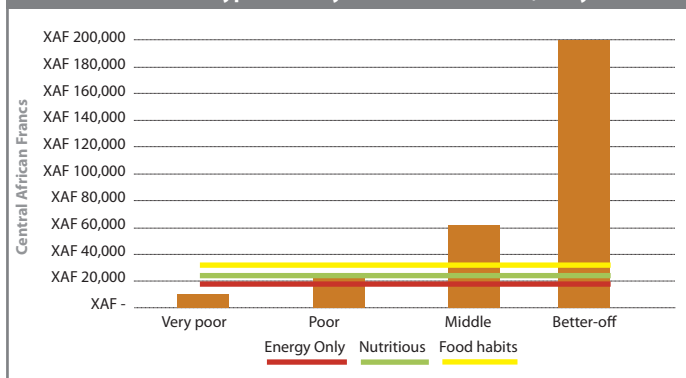


Figure 5 The costs of the various diets compared to the monthly income of a typical family of nine in Bria Town and PK3 camp in the rainy season when receiving a 20-day food basket and free vegetables

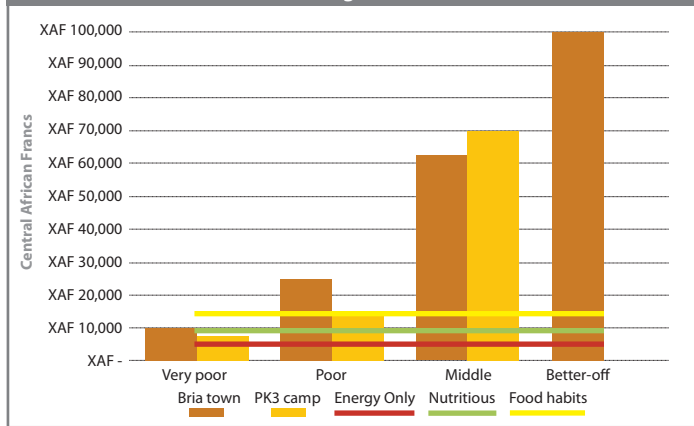
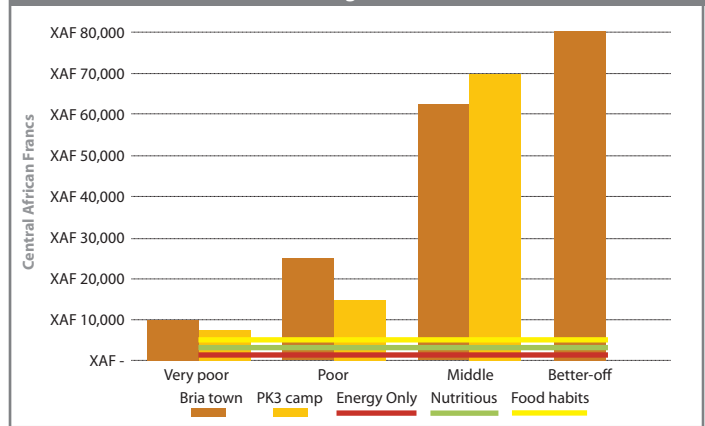


Figure 6 The costs of the various diets compared to the monthly income of a typical family of nine in Bria Town and PK3 camp in the rainy season when receiving a 30-day food basket and free vegetables



What if a 20-day or 30-day food basket is provided every month?

The current GFD in Bria Town and PK3 camp consists of a 20-day ration per person per month (Table 3). Very poor people (40% of population) cannot afford to meet their energy needs for the entire month; poor people (30%) can afford to meet energy needs, but not a nutritious diet or a food habits diet (Figure 2). If this was increased to a 30-day food basket, very poor households still could not afford to meet their energy needs, but poor people could afford to meet energy-only and nutritious diet, although a food habits diet remains out of reach (Figure 3).

What if vegetables were available for free; for example, through kitchen gardening?

If vegetables were available at no cost (for example, through kitchen gardening) in the absence of a food basket, the costs for all diets are reduced significantly, but remain unaffordable for the very poor. For the poor, the energy-only and nutritious diet becomes affordable if all income is used for purchasing food (although this is unrealistic as it doesn't take into account the cost of non-food items, such as clothing and healthcare). Even if all income is used on food, the food habits diet remains unaffordable for the poor (Figure 4). In the camp there is no space for vegetable gardening; an assessment would be needed to investigate whether micro-gardening could be possible.

What if a food basket were provided and vegetables were free?

If a 20-day food basket was provided and vegetables were free, for example through a kitchen-gardening project, an energy-only and nutritious diet would be affordable for the very poor, and all diets would be affordable for the poor (Figure 4). If a 30-day food basket were provided and vegetables were free, all diets would be affordable for all wealth groups, which makes this combination of interventions the most successful model for the current situation (Figure 5).

Several other models were tested, including distribution of multi-micronutrient powders for children aged 6-59 months and pregnant and

lactating women; smaller family size; free eggs for consumption and sale through a livestock distribution; and 25% reduction on all food prices. However, these had no or nearly no effect on costs.

Study limitations

Limitations of the study are that the selection of the standard/typical family is based on experience of the CotD participants, but the reality could be slightly different. No information on prices and availability data of food items during the winter season were collected, so all results and models are only valid for the rainy season. Monthly income was estimated by the data collectors and globally verified in FGDs; however, this was not a very thorough check and no information was collected on expenditure within households on non-food items such as clothing, healthcare and school fees. The HEA conducted by Oxfam provided some information, but the situation in 2015 was very different from the current situation, so it was not possible to use all the HEA data, such as income data.

Discussion

The situation we describe in Bria Town and PK 3 IDP camp is alarming, as the majority of families cannot afford to meet their energy needs, despite receiving a 20-day food basket for the entire household. Even more people are unable to afford a nutritious diet, or one that they would prefer to eat. Programming experience suggests that the situation may be underrepresented in the most recent SMART survey conducted by the Ministry of Health (MoH) and the United Nations Children's Fund (September 2018), which found a GAM prevalence of 7.5% and SAM prevalence of 2.7% for Haute Kotto region. The nutrition situation in Bria is complex and there is no single action that can resolve the issue and ensure that all families will be able to have a nutritious diet. A comprehensive, multisector package of interventions is urgently needed. Results will now be shared with the MoH, UN agencies and other stakeholders in the area.

Recommendations

Based on these findings, several recommendations are made:

- Explore with WFP the possibility for a full 30-day ration for all people in Bria Town and PK3 IDP camp, due to the clear limitations of a 20-day food basket, particularly for the most vulnerable.
- Support efforts to ensure the peace agreement is being respected by all parties, so that roads and markets are safe and accessible for all.
- Support the availability of free vegetables by facilitating families in Bria Town who would like to start a vegetable garden; advocate for an assessment on the possibilities for micro-gardening in the camp when households are unable to access their land; explore possible alternatives for people in the camp to obtain vegetables and fruits (for example, through distribution of fruits and vegetables) or cash to purchase them (while ensuring that markets are able to supply them without creating shortages in areas of origin within CAR).
- Advocate within the Nutrition Cluster and other sectors, such as food security and livelihoods (FSL); water, sanitation and hygiene (WASH); and agriculture, to develop a comprehensive strategy and obtain multisector engagement to address the multiple issues affecting the nutrition situation in Bria.
- Ensure behavior-change activities to improve IYCF and other key nutrition practices are included in all nutrition programmes.
- Conduct a market survey and run the CotD analysis for the dry season to provide information on prices and affordability of a nutritious diet for both seasons.
- Consider conducting a new HEA to provide updated information on current income and expenditure of families in Bria Town and PK3 camp, and collect more detailed information on foods produced by (some of) the families.

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Barriers to infant feeding in emergencies programming in middle and high-income countries

By Mija Ververs and Cindy Hwang



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The authors would like to acknowledge the following IFE Core Group members for their participation in the interviews and for their time and insight: Christine Fernandes, Karleen Gribble, Michelle Branco, Aunchalee Palmquist, Maaikje Aarts, Isabelle Modigell, Suzanne Brinkmann, Sarah Butler, Alessandro Iellamo, Andi Kendle, Zita Weise Prinzo, Marie McGrath, Julie Tanaka and Colleen Emary.

Location: *Middle- and high-income countries (MICs/HICs)*

What we know: In every emergency it is necessary to assess and act to protect and support the nutrition needs and care of all infants and young children.

What this article adds: Interviews were conducted with 14 global experts with experience of working on infant feeding in emergencies (IFE) in recent disasters in MICs and HICs to identify barriers to effective IFE programming. Findings demonstrate a lack of understanding among disaster responders and healthcare professionals of the impact of disasters on infant feeding patterns and risk profiles of infants dependent on breast milk substitutes (BMS), the vulnerability of infants, and the nature of and need for supportive infant feeding interventions to manage new risks. Lack of experience and training among disaster responders and perceptions that IFE is a food rather than a health issue were common findings. Global guidelines on IFE are considered ‘inapplicable’ in MICs/HICs; maternal choice in infant feeding decisions carries great weight, with little consideration of public health and resource implications. Advocacy and preparedness action is urgently needed among disaster responders, healthcare professionals and decision-makers in MICs/HICs on context-specific IFE programming.

Introduction

The IFE Core Group document *Operational Guidance on Infant and Young Child Feeding in Emergencies* provides concise guidance on how to ensure appropriate infant and young child feeding in emergencies for all children under two years of age (IFE Core Group, 2017). While attention often centres on low-income contexts, experiences from recent disasters in middle- and high-income countries (MICs/HICs) have demon-

strated considerable challenges related to infant feeding practices and response. Publications in 2017 and 2018 alone show that problems in infant feeding in emergencies (IFE) have been encountered in Canada (DeYoung et al, 2018), Iraq (Haidar et al, 2017; Ververs et al, 2018), Lebanon (Akik et al, 2017; Shaker-Berbari et al, 2018), Pakistan (Maheen and Hoban, 2017), Puerto Rico (Santaballa, 2018), Ukraine (Summers and Bilukha, 2018) and the migrant crises in Europe (Svoboda, 2017). This study aimed to describe

the internal and external barriers that humanitarian organisations and government agencies faced in addressing infant feeding problems during emergencies in MICs/HICs as perceived by various members of the IFE Core Group.¹

Methodology

Between November 2017 and March 2019, key informants (KIs) were selected based on their active membership in the IFE Core Group, experience working in IFE programming and active engagement on IFE in MICs/HICs in the past five years. Semi-structured interviews were held, during which the KIs were asked to describe barriers within their own organisations and other organisations and government agencies when addressing IFE in MICs/HICs. Notes were taken during the interview; colour-coded, analysed and categorised by theme. Informed consent was sought through a verbal consent process prior to the KI interview. The data was de-identified to assure privacy of the participants.

Results

Fourteen key informant interviews were conducted. At the time of the interviews, the KIs worked for non-governmental organisations (NGOs) (8), United Nations (UN) agencies (3), in academia (2), or as an independent consultant (1). Interviews lasted on average between 30 to 60 minutes. Table 1 illustrates the main barriers related to infant feeding in disasters in MICs/HICs that emerged, described in more detail below.

A. Lack of understanding of a changing risk profile in disaster contexts

All KIs agreed that, in a disaster context, infant feeding patterns change. Some infants who were breastfed before the disaster no longer received breast milk, either because they were separated (temporarily or permanently) from their mothers (due to death, illness, injury or absence), or because mothers believed they were no longer able to breastfeed. Infants dependent on breast

Table 1 Barriers to optimal IFE in disasters in middle- and high-income countries (MICs/HICs) as expressed by key informants

Lack of understanding of a changing risk profile in disaster contexts
Lack of awareness that infants are a vulnerable group
Infant feeding not seen as lifesaving in disaster settings
Lack of experience of IFE
Lack of understanding of the response needed for IFE
Lack of knowledge on risks of breast milk substitutes used in disasters
Perception that global guidelines on infant feeding are not necessarily applicable to MICs/HICs
Perception that maternal choice and autonomy supersede increased public health risks
Lack of clear indicators to show impact of IFE programming
Lack of understanding that infant feeding is not (just) a food issue

¹ The IFE Core Group is a global collaboration of agencies and individuals that address policy guidance and training resource gaps hampering programming on infant and young child feeding support in emergencies. www.ennonline.net/ifecoregroup

milk substitutes (BMS) before the disaster likely remain so during it, but their risk profile changes dramatically. Caregivers providing for BMS-dependent infants may find themselves without electricity, gas, access to safe water and boiling facilities, with few means to hygienically prepare BMS or access necessary infant-feeding supplies. KIs reported that many caregivers in recent crises were preparing BMS in bathrooms of schools, sports facilities and train stations as these were often the only places where water was available. KIs reported a lack of understanding among disaster responders of the changing risk profile of infants during disasters in MICs/HICs and a belief among healthcare professionals that there was no need for specific programmes for their support² as caregivers already knew how to prepare and use BMS.

B. Lack of awareness that infants are a vulnerable group

KIs stated that disaster responders in MICs/HICs often only recognise “classic” vulnerability groups, such as the elderly, people who are ill or immunocompromised, and people who are institutionalised. They are unaware that infants are also a vulnerable group in disasters, especially with regard to their feeding. Additionally, some KIs stated that decision-makers in disaster response programming were often “middle-aged men” who did not identify infants as specifically vulnerable, which explained the absence of infant-feeding preparedness plans.

C. Infant feeding not seen as lifesaving in disaster settings

KIs stated that infant feeding was not seen as lifesaving by healthcare professionals and others, but as an issue relevant for later stages of emergency response after access to shelter, curative care, water and food had been provided. Many disaster responders did not understand that infants need immediate access to either breast milk or safely prepared BMS and that no other food options are suitable. KIs mentioned that responders often believed survival needs to be more or less the same for every group of people and that, if the prevalence of acute malnutrition was relatively low in the disaster area, a nutrition response was low priority. This sometimes led to tension within organisations that worked on health and nutrition in disasters among individuals who saw no need for an IFE response and others who understood the need.

D. Lack of experience of IFE

KIs indicated that many organisations lacked IFE experience at programme-manager level or above. Many disaster responders and healthcare professionals have limited experience in nutrition or in emergency settings specifically in MICs/HICs. Even if some NGO staff had experience in low-income settings where breastfeeding is the norm, this did not adequately prepare them to deal with more complex IFE issues in contexts where breastfeeding is not the norm. KIs also specified that the emergency response training curricula in MICs/HICs often inadequately address nutrition.

E. Lack of understanding of the response needed for IFE

KIs agreed that there was a lack of understanding on what IFE programming entails and how labour intensive it is, with little understanding of the need for individual infant-feeding assessments and counselling. Disaster responders in MICs/HICs were likely to view the response as a commodity-driven exercise and distribute BMS as they would food; it was reported that sometimes medical staff are paid incentives to prescribe BMS for new mothers. BMS was occasionally included in blanket distributions to all caregivers, which disincentivised breastfeeding mothers. Distributions sometimes only included a one-week supply of BMS, and rarely included water, detergent, brushes and fuel to clean or sterilise feeding bottles and boil water to prepare the BMS safely.

F. Lack of knowledge on risks of BMS use in disasters

KIs reported that, when the need for IFE programming was raised (including individual assessments and counselling prior to blanket distribution of BMS), disaster responders asked for scientific evidence showing the risks of BMS distribution. One KI reported that healthcare professionals wanted to use free distribution of BMS in a conflict-affected MIC as an incentive for other interventions and asked the KI to provide evidence of how distribution of BMS would harm infants, if at all.

G. Perception that global guidelines on infant feeding are not necessarily applicable to MICs/HICs

Many KIs noted that, in MICs/HICs, local disaster responders, including Ministry of Health staff, believed that globally established guidelines and evidence did not necessarily apply to their countries or contexts when affected by disasters. This included guidance established by the World Health Organization; notably the International Code of Marketing of Breast-milk Substitutes (WHO, 1981). This was also seen in countries where paediatricians and other healthcare professionals were part of the incentive-driven distribution system of BMS. Many humanitarian organisations were aware of the guidance and best practices, but were conflicted on how to implement the guidance and consequently did not address IFE out of fear of making mistakes or breaking the rules, leading to inaction.

H. Perception that maternal choice and autonomy supersede increased public health risks

There was a consensus among KIs that when a mother of an infant less than six months of age is absent, ill or deceased in a disaster, BMS and additional resources need to be mobilised and provided. However, organisations were little prepared on how to address situations where mothers expressed that they no longer desired to breastfeed. Many KIs noted that healthcare professionals put great emphasis on maternal choice. Often there was no discussion when a mother decided to stop breastfeeding during a disaster and no information was shared about

the risks of BMS. Healthcare professionals felt that the disaster context was not the right context to question the mothers’ decisions, not realising the significant public health consequences – particularly for infants – of this autonomy. Once the choice was made to use BMS, it was rarely discussed or agreed upon which organisation(s) would provide the additional resources needed for the length it was required.

I. Lack of clear indicators to show impact of IFE programming

Several KIs acknowledged that IFE programming lacked clear impact indicators. Some remarked that, unlike community-based management of acute malnutrition (CMAM) programming, IFE programmes were unable to show the number of deaths or diarrhoea episodes averted, or impact on nutrition outcomes.

J. Lack of understanding that infant feeding is not (just) a food issue

KIs expressed concern about how IFE was perceived. They stated that as long as professionals working in sexual and reproductive health, paediatricians and disaster responders perceived IFE as merely a food issue (rather than a public health and child development issue), response in disasters would be inadequate.

Discussion

The analysis of the interviews confirms findings from other recently published articles from MICs/HICs of a lack of understanding among healthcare workers on the risks, challenges and necessary support needed for safe BMS use in emergencies, lack of experience among disaster responders on IFE, and an overall lack of understanding of what constitutes an adequate IFE disaster response (Modigell et al, 2016; Prudhon, 2016). Findings reveal that, at times, a tension exists between IFE experts and co-workers within the same organisation due to differing opinions on IFE programming. There also appears to be a drive within organisations to support maternal choice to use BMS, without factoring in the substantial resource and public health implications for mothers and infants. Findings suggest that, as long as disaster responders continue to regard infant feeding during a disaster as a food issue and not as a significant health concern, IFE programming will remain under-delivered as a necessary intervention to protect infant and child health and nutrition.

Findings of this study demonstrate a significant need for advocacy and awareness-raising on what good (and bad) IFE programming entails within humanitarian organisations and governments, as well as among healthcare professionals and disaster managers in MICs/HICs. Addressing these barriers will ultimately contribute to a reduction in morbidity and mortality among infants in disaster settings.

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² Recommendations on the necessary supplies and support to manage artificial feeding in emergencies are outlined in the Operational Guidance on IFE.

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The relationship between wasting and stunting: a retrospective cohort analysis of longitudinal data in Gambian children from 1976 to 2016

Summary of research¹

Location: *Gambia*

What we know: There are gaps in understanding the relationship between wasting and stunting that often concur in populations and may concur in the same child.

What this article adds: A retrospective cohort analysis on growth-monitoring records from clinics in rural Gambia (1976 to 2016; 5,160 children under two years old) examined whether wasting is a risk factor for stunting, and vice versa; whether the season of birth influences future wasting and stunting; and whether there are gender differences in growth deficits in Gambia. Wasting was defined as weight-for-length z-score (WLZ) <-2. Stunting was defined as length-for-age z-score <-2. Wasting prevalence peaked at 12% (girls) and 18% (boys) at 10-12 months of age, and at 37% (girls) and 39% (boys) at 24 months of age. Wasted children were 3.2 times more likely to be stunted three months later, and children currently stunted were 1.5 times more likely to be wasted three months later. Infants born at the start of the annual wet season (July-October) showed early growth faltering (WLZ) and increased risk of subsequent stunting. Boys were more likely to be wasted, stunted and concurrently wasted and stunted than girls, and were more susceptible to seasonally-driven growth deficits. Results suggest that stunting is in part a biological response to previous episodes of being wasted. Where significant levels of wasting and stunting exist, treatment and prevention interventions should consider joint approaches. More understanding is needed of the physiologic mechanisms and environmental factors of seasonal vulnerabilities and gender differences in wasting and stunting.

Each year, around 800,000 deaths in children under five years of age are in part attributable to wasting; 60% of which are attributable to severe wasting. In addition, over one million child deaths are attributable to stunting, although this association remains poorly understood. Even though progress is being made in decreasing undernutrition in low- and middle-income countries, stunting and wasting during childhood continue to burden people in the poorest regions in the developing world. Although both forms of undernutrition occur together in children in many contexts and may co-occur in the same child

(referred to as “concurrency”), wasting and stunting are often considered separately with respect to how they are managed clinically and programmatically and how they are researched. The rationale behind this conceptual separation of stunting and wasting in terms of etiology and programming has been questioned in several recent reviews and publications (Briend, Khara and Dolan, 2015; Khara and Dolan, 2014). These publications highlight outstanding gaps in understanding the interrelationship between these two forms of undernutrition as a result of insufficient examination of data; in particular from longitudinal cohorts.

The authors of this paper contribute to filling this gap by describing the interrelationships between wasting and stunting in children under two years old through a retrospective cohort analysis, based on growth-monitoring records spanning four decades from clinics in rural Gambia. Three broad research questions were tested: 1) is wasting a risk factor for stunting, and vice versa? 2) does the season of birth influence future wasting and stunting;? and 3) are there gender differences in growth deficits in the Gambia? Anthropometric data collected at scheduled infant-welfare clinics between May 1976 and September 2016 were converted to z-scores, comprising 64,342 observations on 5,160 subjects (median: 12 observations per individual). Children were defined as “wasted” if they had a weight-for-length z-score (WLZ) <-2 against the WHO reference and “stunted” if they had a length-for-age z-score (LAZ) <-2.

Results reveal that prevalence of wasting and stunting were high in this population. The prevalence of stunting increased with age, peaking at 37% (girls) and 39% (boys) at 24 months of age. Wasting showed an early decline in the first three months (reflecting a period of positive weight gain in the months immediately postpartum), followed by a peak at around one year of age (18% in boys, 12% girls). The prevalence of children with concurrency peaked at 9% in boys and 5% in girls, also at around one

¹ Simon M Schoenbuchner, Carmel Dolan, Martha Mwangome, Andrew Hall, Stephanie A Richard, Jonathan C Wells, Tanya Khara, Bakary Sonko, Andrew M Prentice, Sophie E Moore. The relationship between wasting and stunting: a retrospective cohort analysis of longitudinal data in Gambian children from 1976 to 2016. *The American Journal of Clinical Nutrition*, Volume 110, Issue 2, August 2019, Pages 498–507, <https://doi.org/10.1093/ajcn/nqy326>

year of age. Infants who were wasted in the first wet season of their life were more likely to be wasted in their second wet season, even after controlling for recovering during the intervening dry season (OR:3.2; 95% CI:2.3, 4.4).

Infants born at the start of the annual wet season (July–October) showed early growth faltering in WLZ, putting them at increased risk of subsequent stunting. Time-lagged observations show that being wasted was predictive of stunting (OR: 3.2; 95% CI: 2.7, 3.9), even after accounting for current stunting. The reverse also holds: children currently stunted are 1.5 times more likely to be wasted three months later, even after accounting for currently wasting status. Boys were more likely to be wasted, stunted, and concurrently wasted and stunted than girls, as well as being more susceptible to seasonally-driven growth deficits.

This analysis highlights several key issues of relevance to our understanding of the relationship between wasting and stunting in early childhood. First, in this highly seasonal, rural environment with high rates of exclusive breastfeeding, there is a seasonally-driven risk among young infants

of poor growth. This indicates the need to provide more targeted support to breastfeeding mothers and increase attention to infant feeding during periods of seasonal stress. Second, results demonstrate that being wasted leads to increased risk of subsequent stunting. This suggests that stunting is in part a biological response to previous episodes of being wasted and that stunting may represent a deleterious form of adaptation to more overt undernutrition (wasting). Stunted children are not just short, but are children who were earlier more seriously malnourished and who are survivors of a composite process. Third, children who are wasted in one wet season are more likely to be wasted in a subsequent wet season even after recovery, suggesting a continued vulnerability across seasons. Further understanding is needed of related physiologic mechanisms and environmental factors. Fourth, and consistent with much of the global literature, boys are more likely to be wasted or stunted or to have concurrent wasting and stunting; all of which convey added risk of mortality. There is a need to understand this gender difference in vulnerability so that the policy and practice communities can take this into account.

Results indicate that, where there are levels of wasting and stunting of public health significance in a given context, there are compelling reasons for both treatment and prevention interventions to consider wasting and stunting jointly and with awareness of the relation between them. The separation of the wasted infant/child and the stunted infant/child in terms of policies, programmes and research risks opportunities being missed to detect and intervene to prevent both forms of undernutrition in this highly-vulnerable population group. The attainment of World Health Assembly and other global targets remains a very strong global and country-level intent, but these targets will not be achieved where approaches to infant and child undernutrition remain siloed.

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Scurvy outbreak among South Sudanese adolescents and young men – Kakuma refugee camp, Kenya, 2017-2018

Summary of research¹



Refugees wait while food is being prepared in the kitchen of Kakuma refugee camp reception center

Location: Kenya

What we know: Refugee populations dependent on food assistance are at risk of micronutrient deficiencies.

What this article adds: An outbreak of scurvy among 45 adolescent and young adult male South Sudanese refugees suspected cases was confirmed by Centers for Disease Control and Prevention (CDC) in 2018. Those affected had been provided a partial food ration consisting of cereal, pulses, fortified corn-soy blend (CSB+) and vitamin A-fortified oil, plus electronic cash to support dietary diversification to supplement their diets in Kakuma refugee camp, Kenya between 2017 and 2018. From 2015, there were shortages of food assistance commodities and funding shortfalls. Rather than purchasing fresh foods rich in vitamin C, the investigation found those affected selected more calorie-dense cereal and pulses to supplement the energy-deficient food ration. Symptoms resolved after vitamin C treatment. Vitamin C retention of CSB+ after preparation was <16%; insufficient to prevent scurvy. Findings show that food and cash assistance based on average household composition is insufficient for refugees with higher caloric needs; in this instance, adolescents and young adult male refugees.

Background

Scurvy is a relatively rare micronutrient-deficiency disease that can occur among refugees dependent on food assistance due to inadequate access to fresh fruits and vegetables. Kakuma refugee camp in Kenya's Turkana district is home to 148,000 refugees, mostly from Somalia and South Sudan, who receive food assistance. In August 2017, a number of South Sudanese adolescent and young adult male refugees were evaluated for calf pain, chest pain and gingival (gum) swelling. No diagnosis was initially made due to non-specific symptoms and some patients received antibiotics and analgesics. All were managed as outpatients, but

¹ Ververs, M., Wambugu Muriithi, J., Burton, A., Wagacha Burton, J., Oman Lawi, A. (2019). Scurvy outbreak among South Sudanese adolescents and young men – Kakuma refugee camp, Kenya, 2017-2018. *Morbidity and Mortality Weekly Report (MMWR)* US Department of Health and Human Services/Centers for Disease Control and Prevention, January 25, 2019. Vol. 68/ No. 3.

symptoms did not improve. During subsequent months, more young men reported similar symptoms. On 20 January 2018, the United Nations High Commissioner for Refugees (UNHCR) was informed and conducted clinical examinations. Signs and symptoms included lower limb pain and swelling, lethargy, fatigue, gingival swelling and pain, hyperkeratotic skin changes and chest pain. Based on these clinical findings, an outbreak of micronutrient deficiency, particularly vitamin C deficiency (scurvy) was suspected. Vitamin C treatment was given to those affected and, in February 2018, UNHCR requested assistance from Centers for Disease Control and Prevention (CDC) to carry out an investigation. This article summarises the findings.

Investigation and findings

Two health specialists from CDC and UNHCR conducted an outbreak investigation from 11 to 17 March 2018. A suspected scurvy case was defined as the occurrence of lower limb, knee joint or ankle swelling, and at least two of the following: calf pain, shin pain, knee-joint pain, or gingivitis in a person of any age. Because the South Sudanese frequently have very dark skin, the typical dermatologic symptom of petechial haemorrhage was not included in the case definition. Forty-five patients with suspected scurvy were identified and interviewed using a questionnaire developed by investigators to obtain information on symptoms and diet, with a recall period of six months. For a subset of 14 patients, the age structure of the household was analysed. Additional interviews were conducted with staff members from UNHCR, World Food Programme (WFP), the non-governmental organisation responsible for healthcare in the camp, community health volunteers, community leaders and food-shop owners who interacted with the patients. Dietary intake was estimated using WFP's information on provided food rations and NutVal 4.1, a free software programme for calculating the nutritional content of food rations.²

At the time of this investigation, all refugees in Kakuma received food assistance, consisting of cereal, pulses, fortified corn-soy blend (CSB+) and vitamin A-fortified oil. By WFP standards, a food ration should provide 2,100 kcal per person per day (pppd) but, after 2015, a part of the cereal component of the ration was replaced by electronic cash (e-cash) to provide dietary diversification and choice. In 2017 and 2018, one-person households received a 500 Kenyan Shillings (KSh)/pppd and food ration of 900-1,400 kcal/pppd. Households of ≥ 2 persons received 300 KSh/pppd and a food ration of 900-1,700 kcal/pppd. The variations in the food assistance from 2015 onwards resulted from shortages of commodities and funding shortfalls. Among the 45 patients with suspected scurvy, date of symptom onset was known for 44. Among these, 29 (66%) reported onset between August and November 2017.

All 45 patients with suspected scurvy were adolescent and young adult male refugees from South Sudan who had arrived in Kakuma between 2012 and 2017; 33 (73%) had arrived in 2014 or

later. The median age was 19 years (range = 12-32 years). Approximately 58% of patients reported swelling of the lower limb, 53% ankle swelling, and 42% lower-limb pain. Interviews with health personnel and patients found that approximately seven to 10 patients had been unable to walk. Forty of the 45 patients with suspected scurvy were treated with vitamin C. The median household size of patients with suspected scurvy was five persons (range = one to 15 persons). Among the subset of 14 households for which age was collected, nine (64.3%) included only adolescents and young men aged 13-22 years; only five households included a female, only one of whom was an adult.

All patients with suspected scurvy reported that they ate one meal per day. None had income from work or received any remittances and all reported that, rather than using the e-cash to diversify their diets, they used the full e-cash amount to purchase staple foods (e.g., cereals and pulses) and sometimes salt. Forty-three patients (96%) reported that they had not purchased vegetables, fruits or potatoes since their arrival in Kakuma and used the e-cash to supplement their diet with cereals and pulses, which provided an additional 870-1,450 kcal/pppd. All patients who received treatment with vitamin C noted improvement of symptoms within less than one week, particularly reduction in swelling of knee and ankle joints and shin pain. All patients who previously had been unable to walk were able to do so after treatment.

In response to this outbreak, in April 2018 WFP tested the amount of vitamin C in CSB+ after simulating the CSB+ preparation in a laboratory setting. The raw product contains 90 mg vitamin C per 100g, and each refugee received 40g CSB+ per day (equivalent to 36 mg vitamin C per day). The cooking simulation demonstrated that vitamin C retention after preparation was <16%; thus, intake through consumption would be <6 mg vitamin C per day, which is insufficient to prevent deficiency.

Discussion

Scurvy is not new to refugee settings in which a limited amount of fresh foods is available or affordable and has previously been documented in Kakuma refugee camp, with outbreaks reported during 1995-1997 (Verdirame and Harrell-Bond, 2005) and 2003 (UNHCR, 2003). Vitamin C deficiency has also been described among refugees and imprisoned male populations in similar geographic areas (Desenclos et al, 1989; Seaman and Rivers, 1989; Bennett and Coninx, 2002). The energy requirements for males aged 14-18 years and 18-30 years are 3,000-3,400 kcal per day and 2,550-3,900 kcal per day, respectively (FAO/WHO/UNU, 2001), based on moderate physical activity (males aged 14-18 years) and active-to-moderately-active physical activity (men aged 18-30 years). The food ration provided in the camp supplied 900-1,700 kcal/pppd; if all e-cash was used to purchase sorghum and split peas, an additional 870-1,450 kcal/pppd was potentially available, for a maximum theoretical intake of 1,800-2,900 kcal/pppd, depending on

household size. Thus, the food ration met only half of the required caloric needs. Because the e-cash intended for dietary diversification was not used to purchase fresh foods, such as vitamin C-rich fruits and vegetables, but rather to complement the food rations with more calorie-dense and cheaper staple foods to secure the missing calories, vitamin C deficiency resulted. The diet of patients with suspected scurvy contained, on average, <10 mg vitamin C per day; the minimum daily requirement to prevent scurvy is 10 mg (WHO, 1999). Despite previous assumptions, the fortified commodity, CSB+, was not a sufficient source of vitamin C as losses during preparation were much higher than initially estimated. The geographic clustering of suspected cases likely resulted from the relatively higher number of young men living and cooking together in one area of the camp and sharing their limited food rations and e-cash.

Provision of food assistance in refugee settings is often based on average household composition, factoring in age, sex and caloric needs. In this investigation, the adolescent and young males had very high nutritional needs compared with persons in an average household. These differences in household demographics demonstrate that simply providing an average amount of calories calculated on assumed household demographics is inadequate to meet nutritional requirements. In addition to food rations, refugees were provided with e-cash to purchase their own food to add diversity and choice to their diet. However, this investigation indicated that for adolescent and young adult male refugees, both forms of assistance were inadequate to allow access to sufficient calories and the dietary diversification needed for intake of sufficient micronutrients, such as vitamin C. It is important to consider these needs when determining the amount of food or cash assistance provided to adolescents and young adult male refugees.

² www.nutval.net

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Postscript

Further perspectives on scurvy outbreak

Marie McGrath and Jeremy Shoham, Field Exchange editors, interviewed Mija Ververs, who undertook the field trip with CDC to investigate the scurvy outbreak, for more insights.

Q: It seems these adolescent boys were the only population group that was affected by this outbreak. Is that correct? Regarding the context in which these young men were living, could you elaborate more on their social circumstances?

The adolescent boys who were affected by this outbreak were fleeing war. They had no source of income and were diligently attending and enjoying school in the camps. This meant they were wholly dependent on food assistance and cash for their nutrition. As far as we know, these young men were the only population group that was affected by this outbreak. The CDC/UNHCR investigation focused mostly on these cases and their situation. Having an adult woman in the household seemed to be a protective factor in this population. Some of these boys had arrived into the camp at 10-14 years of age, having never learned to cook or garden or know what a healthy diet was.

Q: What impact did this situation have on the boys?

Scurvy had a significant personal impact on these boys. The highlight of their day was attending school and playing football. The physical consequences meant they could not play football, which had a considerable psychological impact on them; some had become demoralised and a few expressed thoughts of returning back to South Sudan “to pick up weapons to fight for their own food”. In general, the condition did not heighten school

dropout if they could still walk, reflecting their commitment to their schooling.

Q: Regarding the findings on the CSB+ vitamin C losses in preparation, how does this compare with other official quality control data? What do you think are the implications of the findings regarding CSB+ more broadly and what actions do you think are needed?

Vitamin C retention was less than expected by WFP. Based on literature, they expected a 50% retention. Poor retention is not just due to heat liability of vitamin C, but mostly oxidation, which leads to losses. Oxidation is affected by preparation method – the more a cooking pot of CSB is stirred, the more oxygen is introduced and the greater the loss.

We need to establish whether CSB needs to be a source of vitamin C. If the answer is yes, then we need more studies on how to prevent losses in preparation and to examine if higher levels of fortification can prevent loss. If not, then we need to make sure to accommodate vitamin C from another source. The findings also raise concern about other vitamins – vitamin C deficiency may be a proxy for other sub-clinical deficiencies.

Q: What do you think were the key contributing factors to this outbreak?

The adolescent boys lived together as a group and prepared their meals together. They ate all the CSB obtained within the first

few days of receiving it. This meant that they had no intake of vitamin C, as a water-soluble vitamin, for the rest of the month. However, this was not the main issue. A more critical contributing factor to this outbreak was the cut in food assistance leading to reduced rations of staple foods distributed. Cash programming was initiated to partly compensate for less ‘in-kind’ food provision and to facilitate food diversification, such as purchase of fruits and vegetables. However, without adequate amounts of staple foods in the general ration, cash subsidies were used by these boys to purchase staples rather than fruit and vegetables, as was intended.

The higher nutrient requirements of adolescent boys were also a critical factor. Active, growing adolescent males have a high caloric demand; ration targets of 2,100 kcal/day based on ‘average’ household composition are inadequate for young men, who need closer to 3,000 kcal/day. We did not look to see if these boys were acutely malnourished, but this is also not easy to diagnose within the Dinka population, whose physique is typically lean and tall.

When household demographics are skewed, as in this case or, for example, in contexts with peace-keepers (military dominated by males), young male migrants (as in the European migrant crisis), or in prisons (where we have also seen scurvy outbreaks), energy and nutrient estimates based on average households are not adequate. Differences in demographics and energy and nutrient requirements do not just apply to men; women may also be disproportionately represented and have heightened needs, such as for iron, and the response should be contextualised accordingly.

What immediate key action would you like to see?

We need to examine and change our way of ‘doing business’ when it comes to nutrition-assistance targets. Currently, the NutVal¹ programme includes adolescent boys and girls as one group. As a priority, this should be revised to distinguish boys and girls to accommodate their different energy and nutrient needs and so facilitate more appropriate food-assistance planning.

¹ www.nutval.net



Refugees receiving food at Kakuma refugee camp reception center



Adolescent girls' nutrition and prevention of anaemia: a school-based multisectoral collaboration in Indonesia

Research snapshot¹

In Indonesia, the national prevalence of anaemia among females aged 15–24 years is 18.4%. Screening of junior high-school students in West Java indicated a prevalence of >50%. Indonesia's 2016 national programme for anaemia prevention and control in adolescent girls and women of reproductive age (WIFAS) in-

cludes a weekly iron and folic acid (IFA) supplementation of adolescent girls through a pre-existing school-health programme supported by four ministries: Ministry of Health (MoH), Ministry of Education and Culture, Ministry of Religious Affairs, and Ministry of Home Affairs. A demonstration of this project was implemented in two

districts of West Java between 2015 and 2018. This involved three core activities: (1) increasing awareness of and securing government commitment to the WIFAS project and adolescent health in general; (2) improvement in IFA supply through skills building of MoH staff and strengthening of supply-chain management systems and on-the-job training for teachers, primary health facility staff and district officials of each sector; (3) increasing demand and acceptability of the project through a behavior-change intervention strategy, including a branded campaign, "healthy, beautiful and smart without anaemia".

Modelled estimates show that the demonstration project may have contributed to preventing 4,071 cases of anaemia by reaching 52,000 adolescent girls. Existing platforms and policy frameworks for action helped to catalyse multisector collaboration in this context. Political commitment from the highest policy-maker of each sector was key. It was also important to gain local and institutional commitment, such as from each school principal. Other drivers of success were capacity-building at all levels and investment in strengthening individual and institutional relationships across sectors to help foster collaboration. Key to engagement by all stakeholders was data to drive decisions and accountability (and so harmonisation and collaboration on data collection); monitoring systems; and joint responsibility for and ownership of shared results, outcomes and goals. The authors conclude that multisector collaborations of this kind require resources and coordination and should be tailored to the unique needs of individual countries in order to further reach adolescents.



¹ Roche, M.L., Bury, L., Yusadiredja, I.N., Asri, E.K., Purwanti, T.S., Kusumiyati, S., Bhardwaj, A. and Izwardy, D. (2018) Adolescent girls' nutrition and prevention of anaemia: a school-based multisectoral collaboration in Indonesia. *BMJ* 2018; 363 doi: <https://doi.org/10.1136/bmj.k4541>

Impact on child acute malnutrition of integrating a preventative nutrition package into facility-based screening for acute malnutrition in Burkina Faso

Research snapshot¹

The impact of community-based management of acute malnutrition (CMAM) is often limited by low coverage of screening for acute malnutrition, influenced by a perceived lack of benefits among caregivers. A cluster-randomised controlled trial was undertaken to test the impact of integrating a preventative nutrition package into routine, facility-based monthly screening of children under two years old in Burkina Faso on acute malnutrition screening and treatment coverage and acute malnutrition incidence and prevalence. Intervention and comparison groups (16 health centres each) had access to standard CMAM and facility-based well-baby consultation services. Caregivers in the intervention group also received age-appropriate

monthly behaviour-change communication on health and nutrition and a monthly supply of small-quantity, lipid-based nutrient supplements (SQ-LNS) for children over six months of age. A repeated cross-sectional study of children aged 17 months old ($n = 2,318$ at baseline and 2,317 at endline two years later) was undertaken to assess impacts on acute malnutrition screening coverage, treatment coverage and prevalence. A longitudinal study of 2,113 children enrolled soon after birth and followed up monthly for 18 months was undertaken to assess impacts on acute malnutrition screening coverage, treatment coverage and incidence. Results showed that, relative to the comparison group, the intervention group had significantly higher monthly acute malnutrition screening coverage (cross-

sectional study: +18 percentage points [pp], 95% confidence interval [CI] 10–26, $P < 0.001$; longitudinal study: +23 pp, 95% CI 17–29, $P < 0.001$). However, there were no impacts on acute malnutrition treatment coverage, acute malnutrition incidence or acute malnutrition prevalence. Further research is needed on remaining barriers to CMAM uptake and methods of integrating preventative and CMAM services.

¹ Becquey E, Huybregts L, Zongrone A, Le Port A, Leroy JL, Rawat R, et al. (2019) Impact on child acute malnutrition of integrating a preventative nutrition package into facility-based screening for acute malnutrition during well-baby consultation: A cluster-randomized controlled trial in Burkina Faso. *PLoS Med* 16(8): e1002877. <https://doi.org/10.1371/journal.pmed.1002877>

Impact on child acute malnutrition of integrating small-quantity lipid-based nutrient supplements into community-level screening for acute malnutrition in Mali

Research snapshot¹

The impact of community-based management of acute malnutrition (CMAM) is often limited by low coverage of screening for acute malnutrition. A two-arm cluster-randomised controlled trial in 48 health centre catchment areas in the Bla and San health districts in Mali aimed to test the impact of distributing small-quantity, lipid-based nutrient supplements (SQ-LNSs) at monthly screenings held by community health volunteers (CHVs). Screening sessions included behaviour change communication on nutrition, health and hygiene practices (both study arms), and SQ-LNSs (one study arm). Impact was assessed on acute malnutrition screening and treatment coverage and on acute malnutrition incidence and prevalence. A repeated cross-sectional study (n = 2,300) with baseline and endline surveys was used to examine impacts on acute malnutrition screening and treatment coverage and prevalence. A longitudinal study of children enrolled at six months of age (n=1,132) and followed monthly for 18 months was used to assess impact on acute malnutrition screening and treatment coverage and incidence.

The intervention significantly increased acute malnutrition screening coverage (cross-sectional study: +40 percentage points [pp], 95% confidence interval [CI]: 32, 49, $p < 0.001$; longitudinal study: +28 pp, 95% CI: 23, 33, $p < 0.001$). No impact on treatment coverage or acute malnutrition prevalence was found. Children in the intervention arm, however, were 29% (95% CI: 8, 46; $p = 0.017$) less likely to develop a first acute malnutrition episode (incidence) and, compared to children in comparison arm, their overall risk of acute malnutrition (longitudinal prevalence) was 30% (95% CI: 12, 44; $p = 0.002$) lower. The intervention lowered CMAM enrolment by 10 pp (95% CI: 1.9, 18; $p = 0.016$), an unintended negative impact likely due to CHVs handing out preventive SQ-LNSs to caregivers of acute malnutrition children instead of referring them to the CMAM programme. Incorporating SQ-LNSs into monthly community-level acute malnutrition screenings and behaviour change communication sessions was highly effective at improving screening coverage and reducing acute malnutrition incidence, but it did not improve acute malnutrition prevalence or treatment coverage. Further research is needed on remaining barriers to CMAM uptake.



An 11 months old is admitted to a health centre in Kalabankoro, Mali, suffering from severe acute malnutrition

WFP/Cecilia Aspe

¹ Huybregts L, Le Port A, Becquey E, Zongrone A, Barba FM, Rawat R, et al. (2019) Impact on child acute malnutrition of integrating small-quantity lipid-based nutrient supplements into community-level screening for acute malnutrition: A cluster-randomized controlled trial in Mali. *PLoS Med* 16(8): e1002892. <https://doi.org/10.1371/journal.pmed.1002892>

Supportive supervision to improve the quality and outcome of outpatient care among malnourished children in Uganda

Research snapshot¹

Suboptimal quality of paediatric care has been reported in resource-limited settings, but little evidence exists on interventions to improve it. This study aimed to test supportive supervision (SS) for improving

health status of malnourished children, quality of case management, overall quality of care, and the absolute number of children enrolled in nutrition services through a cluster randomised trial in Arua district, Uganda. Six health centres were randomised to receive SS or no intervention. SS specific to nutrition services was delivered at a high frequency by a team of two trained local staff to health centre staff at intervention centres (phase one). SS was later extended to community health workers (CHWs) (phase two). The primary outcome was the cure rate of children aged between 6 and 59 months enrolled in health centres for the management of severe or moderate acute malnutrition. Quality of case management was assessed by six pre-defined indicators; quality of care was assessed using the National Nutrition Service Delivery Assessment (NSDA) tool; and access to care was estimated by the number of children accessing health centre nutrition services.

1.56–2.34, $p=0.001$), quality of care as scored by NSDA (RR=1.57, 95% CI: 1.01–2.44, $p=0.035$) and correctness in complementary treatment (RR=1.52, 95% CI: 1.40–1.67, $p=0.001$) were significantly higher compared with the control group. With the extension of SS to CHWs, significantly more children (38.6%) accessed care from intervention health centres than they had previously (38.4% before extension of SS to CHWs and 62% after; RR=1.26, 95% CI: 1.11–1.44, $p=0.001$). The proportion of children accessing care in the control group was 45% in phase one and 49% in phase two. The authors conclude that SS significantly improved the cure rate of malnourished children and the overall quality of care and providing SS to CHWs significantly increased the crude number of children enrolled in nutrition services. More research is needed to confirm these results and evaluate the cost-effectiveness of SS.



children enrolled in nutrition services in Arua district, Uganda

WFP/Venessa Vick

A total of 737 children was enrolled in the study. In the intervention arm, the cure rate (83.8% vs 44.9%, risk ratio (RR)=1.91, 95% CI:

¹ Lazerini M, Wanzira H, Lochoro P, et al. Supportive supervision to improve the quality and outcome of outpatient care among malnourished children: a cluster randomised trial in Arua district, Uganda. *BMJ Global Health* 2019;4:e001339. doi:10.1136/bmjgh-2018-001339

Inpatient and outpatient treatment for acute malnutrition in infants under six months: a qualitative study from Senegal Research snapshot¹

Treatment for children aged 6-59 months with acute malnutrition has shifted towards an outpatient, community-based approach, while infants under six months old are mostly treated in hospital. In light of the large problem of malnutrition in infants under six months old in Senegal (5.4% prevalence), a descriptive study was undertaken to describe barriers and facilitators for outpatient and inpatient treatment of care for this age group in a semi-urban setting. In-depth interviews and focus group discussions with mothers of malnourished infants, conducted over four months (July-September 2015) in two case clinics (one inpatient, one outpatient), explored three key factors for a successful nutrition programme: access, quality of care and community engagement.

Nine facilitators and barriers emerged from the data. Outpatient care was perceived to be more accessible than inpatient in terms of distance and cost; mothers were motivated to seek support from community health centres when free infant formula was available as part of care. Trust could be more easily generated in an outpatient setting that mothers were already familiar with. In terms of quality of care in the outpatient setting, the cup-and-spoon re-lactation technique was used effectively but needed close supervision and basic medical care could be offered to outpatients, provided that referral of complicated cases was adequate. Inpatient care allowed for more intensive health/nutrition education due to more time for individualised support, although this could be

done in an outpatient setting. The lack of community-level breastfeeding counselling and community education on breastfeeding was identified as an important gap. In terms of community engagement, the community appeared to play a key role in treating malnourished infants through its influence on health-seeking behaviour, peer support and breastfeeding practices. The level of support to mothers of malnourished infants varied widely and domestic task load of mothers was often a barrier to infant care and breastfeeding. The authors conclude that outpatient care does facilitate access to treatment and the community has the potential to be much engaged, although more attention is required for breastfeeding support. An outpatient community-based treatment approach with an emphasis on breastfeeding should be considered going forwards.

¹ van Immerzeel TD, Camara MD, Deme Ly I, and de Jong RJ. Inpatient and outpatient treatment for acute malnutrition in infants under 6 months; a qualitative study from Senegal. *BMC Health Services Research* (2019) 19:69 <https://doi.org/10.1186/s12913-019-3903-x>

Prevention and treatment of acute malnutrition in humanitarian emergencies: a multi-organisation collaboration to increase access to synthesised evidence Research snapshot¹

Programme decision-making to prevent and treat acute malnutrition in an emergency can be hampered by a lack of accessible and relevant overviews of directly available, robust research evidence. This paper describes a process whereby a multi-disciplinary, international group of specialists worked together to build relevant and effective collections of available systematic reviews on acute malnutrition, published and disseminated as online collections, to improve access to concise, synthesised, relevant and up-to-date evidence for programming.

A group of 21 volunteers and stakeholders from multiple backgrounds collaborated between March

2017 and March 2018 to review and curate collections of systematic reviews of interventions for the prevention and treatment of moderate and severe acute malnutrition (MAM and SAM) in humanitarian emergencies. The methodology loosely followed general guidance for overviews of systematic reviews with a pre-defined question, formulated using the Population, Intervention, Comparison, Outcomes and Study design (PICOS) format and search strategies applied to multiple databases. Pairs of collaborators first screened the search yields to identify potentially eligible reviews, after which other pairs screened the list of potentially eligible reviews for relevance that were included in

the final collections. Three collections were published and are publicly available: one of non-Cochrane reviews published on the Evidence Aid website² and two of Cochrane reviews; one on the treatment of acute malnutrition and one on its prevention, published by Cochrane.³ These collections will be updated regularly to provide up-to-date evidence to inform nutrition-in-emergencies decision-makers and programmers. Such collaboration and collation could benefit other subject areas; Evidence Aid is eager to support new collections around other topics relevant to humanitarian emergencies and can be contacted at info@evidenceaid.org

¹ Allen, C., Jansen, J., Naude, C. et al. Prevention and treatment of acute malnutrition in humanitarian emergencies: a multi-organisation collaboration to increase access to synthesised evidence. *Int J Humanitarian Action* 4, 11 (2019) [doi:10.1186/s41018-019-0057-8](https://doi.org/10.1186/s41018-019-0057-8)
² Evidence Aid (2018) Evidence aid nutrition collection. Available at: www.evidenceaid.org/prevention-and-treatment-of-acute-malnutrition-in-emergencies-and-humanitarian-crises/
³ Cochrane Special Collections. Treatment of malnutrition, available at: www.cochranelibrary.com/collections/doi/10.1002/14651858.SC000032/full; and Prevention of malnutrition, available at: www.cochranelibrary.com/collections/doi/10.1002/14651858.SC000031/full

Efficacy of F-100, diluted F-100, and infant formula for treatment of infants under six months with severe acute malnutrition Research snapshot¹

A double-blind randomised clinical trial was conducted between March 2012 and January 2015 to assess the efficacy and safety of F-100, diluted F-100 (F-100D), and infant formula (IF) for dietary management in the rehabilitation phase of the management of severe acute malnutrition (SAM) of infants under six months of age. Infants (n = 153) were enrolled at the Nutrition Rehabilitation Unit of Dhaka Hospital of the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr) in Dhaka and were randomly assigned to any of the three diets after stabilisation.

Two ml blood was collected on study days 1, 3, and 7 for measuring serum electrolytes, creatinine and osmolality, urine samples for specific gravity and osmolality creatinine ratio. Renal solute load (RSL) and potential RSL were calculated. Infants were discharged when they had gained 15% of their admission body weight or had oedema-free weight-for-length z-score (WLZ) ≥ -2 .

Results showed that infants fed F-100 and F-100D had higher weight gain than infants who received IF. The mean difference between F-100 and IF was 4.6 g/kg/d (95% CI 1.5–7.6, P = 0.004). The mean difference between F-100D and IF was

3.1 g/kg/d (95% CI 0.6–5.5, P = 0.015). Total energy intake from the study diet and breastmilk was significantly higher in infants fed F-100 compared with the other two diets (P = 0.001 in each case). RSL was highest in infants fed F-100, but serum sodium showed no sign of elevation. Urinary specific gravity and serum sodium values were within normal range. Controversy about feeding F-100 has concerned its renal solute load and the possible risk of negative water balance and hypernatraemic dehydration. As expected, the estimated renal solute load was lower than the potential renal solute load in all three groups as solutes were being deposited in tissue growth. The authors conclude that F-100 can be safely used in the rehabilitation phase for infants under six months of age with SAM and there is no need to prepare alternative formulations.

¹ Islam, M.M., Huq, S., Hossain, M.J. et al. *Eur J Nutr* (2019). <https://doi.org/10.1007/s00394-019-02067-5>

Women's empowerment, food security and nutrition of pastoral communities in Tanzania

Research snapshot¹

In response to environmental, social and political pressures, many of the world's 300-600 million pastoralists are shifting to more sedentary livelihood strategies ('sedentarisation'), negatively affecting their food security and maternal and child dietary intake. For example, reduced access to common land can reduce the ability of pastoralists to feed their livestock and therefore threaten their reliance on

animal products for household food security and nutrition.

A mixed-methods study examined the relationship between women's empowerment, household food security, and maternal and child dietary diversity in pastoral communities in two regions of Tanzania to understand effective pathways to enhance maternal and child nutrition. A quantitative survey of 373 pastoralist women was undertaken; indicators across three domains of women's empowerment (access to and control over resources, control and use of income, and extent and control of work time) were scored and matched to a household food-insecurity access scale. Qualitative surveys were undertaken with two subsets of 176 and 62 semi-sedentary, extensive pastoralist women to understand the gender dynamics affecting the women's empowerment-food security and women's empowerment-nutrition security nexus.

Both methodologies showed a positive correlation between women's empowerment, their dietary diversity and that of their children, and therefore their nutrition

security. Only the qualitative surveys indicated a positive relationship between women's empowerment and household food security. A customary distinction of gender roles was revealed between men as guarantors of household food security and women as in charge of nutrition security; women's perception is that this distinction is detrimental to achieving nutrition security. This may explain the discrepancy in quantitative and qualitative results. More qualitative research is needed to understand the complex links in sedentarising communities between women's empowerment and food security and nutrition, as affected by the interplay of new livelihood arrangements, social and gender norms and household relations, as well as individual characteristics. The authors suggest the adoption of an empowerment-nutrition framework that includes non-economic domains of empowerment and control over purchasing, sales and preparation of animal-source food products. Dairy projects could combine technology and institutional interventions at different stages to enhance women's empowerment and opportunities should be considered to enhance gender equity in rapidly sedentarising communities.

¹ Galiè, A., Teufel, N., Webb Girard, A., Baltenweck, I., Dominguez-Salas, P., Price, M.J., Jones, R., Lukuyu, B., Korir, L., Raskind, I.G., Smith, K., Yount, K.M. (2019) Women's empowerment, food security and nutrition of pastoral communities in Tanzania. *Global Food Security* 23 (2019) 125-134



A woman harvesting beans from her farm, Dodoma region, Tanzania

WFP/Rein Skillebrand

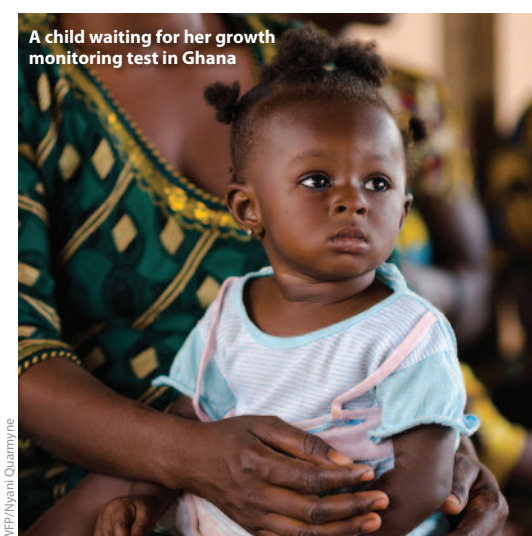
Alternative ready-to-use therapeutic food yields less recovery than the standard for treating acute malnutrition in children from Ghana

Research snapshot¹

Only 20% of children with severe acute malnutrition (SAM) have access to ready-to-use therapeutic food (RUTF), the cost of which limits its accessibility. This randomised, double-blind controlled, clinical-equivalence trial compared the effectiveness of an alternative RUTF with standard RUTF in the home-based treatment of children aged 6 to 59 months with uncomplicated SAM and moderate acute malnutrition (MAM) in Ghana. Study participants were recruited at 29 clinics throughout five districts in the Brong Ahafo region. Alternative RUTF was composed of whey protein, soybeans, peanuts, sorghum, milk, sugar and vegetable oil. Standard RUTF included peanuts, milk, sugar and vegetable oil.

Analysis, conducted on an intention-to-treat basis, revealed that of the 1,270 children treated for SAM or MAM, 516 of 642 (80%) receiving alternative RUTF recovered (95% CI=77% to 83%) and 554 of 628 (88%) receiving standard RUTF recovered (95% confidence interval [CI]=85% to 90%). The difference in recovery

was significant at 7.7% (95% CI=3.7% to 11.7%; $p<0.001$). Among the 401 children with SAM, the recovery rate was 130 of 199 (65%) with alternative RUTF and 156 of 202 (77%) with standard RUTF ($P=.01$). The default rate in SAM was 60 of 199 (30%) for alternative RUTF and 41 of 202 (20%) for standard RUTF ($P=0.04$). Children enrolled with SAM who received alternative RUTF had less daily weight gain than those fed standard RUTF (2.4 ± 2.4 g/kg vs. 2.9 ± 2.6 g/kg, respectively; $P<0.005$). Among children with moderate wasting, recovery rates were lower for alternative RUTF, 386 of 443 (87%), than standard RUTF, 397 of 426 (93%) ($P=0.003$). The lower-cost alternative RUTF was less effective than standard RUTF in the treatment of SAM and MAM. Higher energy, protein and fat content in standard RUTF and/or food intolerance to or bioactive metabolites in the alternative RUTF may be contributing factors but, importantly, most failures in the trial were the result of defaulting and the definitive outcomes of those cases are unknown. The authors recommend caution and further testing before any alternative RUTF is used in an operational setting.



A child waiting for her growth monitoring test in Ghana

WFP/Nyami Ouamye

¹ Kohlmann K, Callaghan-Gillespie M, Gauglitz JM, Steiner-Asiedu M, Saalia K, Edwards C, Manary MJ. Alternative ready-to-use therapeutic food yields less recovery than the standard for treating acute malnutrition in children from Ghana. *Global Health: Science and Practice* 2019. www.ghsjournal.org

Analysis of trends in SMART nutrition survey data from South Sudan between 2004 and 2016

Research snapshot¹



Despite decades of nutrition and health interventions, emergency levels of global acute malnutrition (GAM) persist in former Northern Bar el Ghazal State in South Sudan; the reasons behind the persistently high levels have not been explored. This study aimed to identify and analyse changes in patterns of malnutrition and key factors associated with malnutrition in South Sudan from 2004 to 2016. Anthropometric data collected from children under five years of age through Standardised Monitoring and Assessment of Relief and Transitions (SMART) nutrition surveys from 2004 to 2016 were analysed to estimate seasonal differences in the prevalence of GAM (weight-for-height z-score (WHZ) <-2) and severe acute malnutrition (SAM) (WHZ <-3). Risk factors for GAM were explored using data collected in 2014 and 2015.

Results show that, in Aweil West and North, a reduction in GAM was observed between September 2004 (21.0%, CI 18.2-23.9) and No-

vember 2009 (16.2%, CI: 13.7-18.9). SAM prevalence remained largely unchanged, reducing by 0.9 percentage points from 3.2% (CI: 1.9-4.4) in 2004 to 2.3% (CI: 1.3-3.4) in 2009. The apparent decline in GAM likely reflects a seasonal difference, as the five-year overall mean GAM was 20.4% (SD: 0.403) and 17.5% (SD: 0.380) in pre- and post-harvest seasons respectively.

Data collected in 2014 and 2015 revealed that prevalence of undernutrition (weight-for-age) and stunting (height-for-age) were higher in males compared to females (p=0.008 and p=0.001 respectively); no significant gender differences were found in WHZ or GAM. Improvements were found in Aweil North in coverage of vitamin A supplementation (21.5% in 2014 to 57.7% in 2015); coverage of measles vaccination fell (51.6% to 41.4% during the same period). High morbidity rates were found, with almost two thirds of children reported as sick in the past two weeks (2015); however, the proportion of caregivers seeking treatment for sick children increased from 69% in 2014 to 81% in 2015. In multivariable linear regression

modelling, not having been sick in the past two weeks (aOR 0.78, 95% CI 0.61, 0.99, p=0.047) and not having consumed juice (possibly associated with consumption of unclean water and unhygienic juice preparation) (aOR 0.67, 95% CI 0.45, 0.99, p=0.045) were protective against GAM after adjusting for all potential confounders. Data are cross-sectional, so interpretations should be made with caution.

This study highlights the impact of instability on the nutritional status of a generation, with the high prevalence of GAM and SAM remaining unchanged since 2004. Results suggest that focusing on care-seeking behaviours and hygiene practices may be beneficial in this population. Results also strongly suggest that the causes of malnutrition in this setting should be examined more comprehensively and that effective prevention programmes are designed that address the underlying causes of malnutrition.

¹ Hogan et al. (2019) Analysis of trends in SMART Nutrition Survey data from South Sudan between 2004 and 2016. South Sudan Medical Journal 2019; 12(4):124-127

Defining, measuring and interpreting the appropriateness of humanitarian assistance

Research snapshot¹

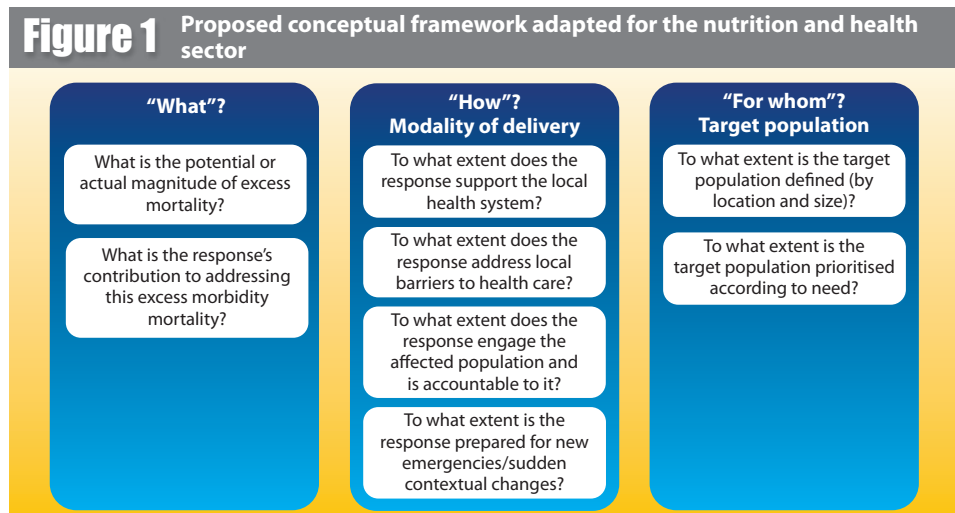
Measuring and reporting the appropriateness of humanitarian assistance is a matter of accountability and is critical for the assessment of impact and value for money. A recent review identified eight methods of assessing humanitarian response appropriateness and assessed the key features and limitations of each. This review is part of a broader project to enhance the accountability of humanitarian responses through developing auditing approaches for real-time monitoring. The methods were found to vary considerably in their definitions of 'appropriateness', provide insufficient guidance on measurement, be vulnerable to interpretive bias, and frequently report findings in an ambiguous manner. They do not allow for assessment of changes in 'appropriateness' of a given response over time, nor comparison between responses. A conceptual framework is proposed based on the premise that the appropriateness of a response or intervention is determined by the extent to which it is designed to save lives, alleviate suffering and maintain human dignity. Figure 1 shows the conceptual framework adapted to the health and nutrition sector.

The authors define 'appropriate humanitarian assistance' as a combination of (i) an intervention/

package of services that addresses objective needs and threats to the health or welfare of crisis-affected populations; (ii) a modality of delivery that reflects the context, enhances user acceptability and promotes sustainability where possible; and (iii) having a target beneficiary population that is clearly defined, sufficient in size and prioritised according to need. This framework includes a specific set of questions relating to the

'what/how/to whom' domains of a humanitarian project or response; a semi-quantitative scorecard to score each of the questions/domains; and a brief narrative contextualisation of the findings. A data-collection tool and operational guidance are now being developed to test the method in a number of ongoing health and nutrition responses. The approach is designed for self-assessment by response teams for early course-correction and real-time ongoing evaluation to ultimately enhance governance, accountability and transparency in humanitarian response.

¹ Abdelmagid N, Checchi F, Garry S and Warsame A. Defining, measuring and interpreting the appropriateness of humanitarian assistance. Journal of International Humanitarian Action (2019) 4:14 <https://doi.org/10.1186/s41018-019-0062-y>



How Ebola virus disease affected nutrition in Sierra Leone: a food value-chain framework to improve future response strategies

Research snapshot¹

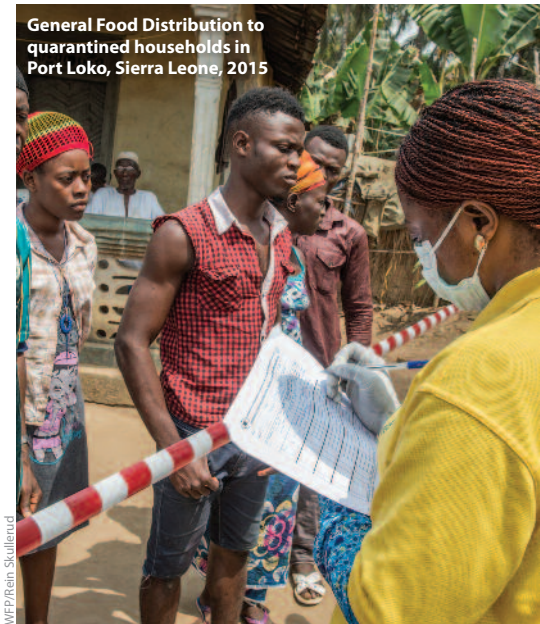
In 2014-2016 an outbreak of Ebola virus disease (EVD) in Sierra Leone resulted in 14,124 cases and 3,956 deaths. This qualitative study sought to understand how the outbreak impacted the nutrition sector in Sierra Leone and to consider a nutrition preparedness and response framework for planning for future outbreaks. In-depth interviews were conducted with key informants (n=21; government stakeholders, United Nations and non-governmental organisation staff) and community informants (n=21; EVD survivors, health workers and community leaders) and key themes identified.

Findings show that EVD outbreak effects and related response strategies contributed to disruptions across the multiple, interconnected systems comprising the food value chain for optimal nutrition in Sierra Leone, similar to disruptions seen in large-scale earthquakes. Direct and indirect effects were experienced on agricultural production and food storage and processing, as well as on distribution, transport, trade and retailing. Interviews described the aggregate negative effect of this outbreak on food security, infant and young child feeding practices and nutrition. In particular, 21-day quarantines to restrict population movement

placed additional economic and social burdens on people that contributed to individual and household diet-related challenges. Infants and young children were disproportionately affected through impacts on breastfeeding, complementary feeding and caregiving practices; both indirectly by EVD and indirectly through market disruption and disease-containment measures.

Food assistance during the response (treatment for acute malnutrition and food baskets to improve household food security) was highly accepted and sharing was reported. Nutrition-sensitive interventions were not central to the initial response, despite impact of EVD across the food value chain. Instead, EVD containment and survival took priority. Culturally appropriate social and behavior change communication was a critical response component for improving health, nutrition and hygiene-related behaviours through community engagement.

In preparation for future outbreaks of this magnitude, a food value-chain approach may prove useful for policy and planning, including developing improved guidelines for employing coordinated, nutrition-specific and nutrition-sensitive approaches to address immediate and underlying determinants of nutrition.



General Food Distribution to quarantined households in Port Loko, Sierra Leone, 2015

WFP/Rein Skallerud

¹ Kodish SR, Bio F, Oemcke R, Conteh J, Beauliere JM, Pyne-Bailey S, et al. (2019) A qualitative study to understand how Ebola Virus Disease affected nutrition in Sierra Leone – A food value-chain framework for improving future response strategies. *PLoS Negl Trop Dis* 13(9):e0007645. <https://doi.org/10.1371/journal.pntd.0007645>

Ebola virus disease and breastfeeding: time for attention

Research snapshot¹



Democratic Republic of the Congo (DRC), Tanganyika province, May 2018

WFP/Jacques David

Over 2,800 cases of Ebola virus disease (EVD) have been confirmed in the ongoing outbreak in the Democratic Republic of Congo (DRC); most cases are adults and 56% of cases are women. Ample information is available on the presence of EVD in bodily fluids such as blood, urine, and semen, and on the prevention of transmission from these fluids. However, information on EVD and breastmilk is limited. The current recommendation of testing breastmilk only in mothers who are known EVD survivors might be insufficient, because asymptomatic lactating mothers in households affected by EVD have also been shown to have Ebola virus-positive breastmilk. In DRC, current guidance on breastfeeding issued by the Ministry of Health and supported by the United Nations Children's Fund recommends that, in EVD-affected households, mothers and infants who have symptoms but are Ebola virus blood-negative should continue breastfeeding.

The authors of this correspondence are concerned about these guidelines, because

Ebola virus blood negativity does not necessarily equal safe breastmilk. Health practitioners and policy-makers are in desperate need of more information on EVD and breastmilk. Systematic research is needed on EVD appearance and duration in breastmilk; transmissibility through breastmilk, taking into account the effect of factors such as infant saliva on the virus; and the provision of evidence-based advice for asymptomatic lactating mothers in EVD-affected households. The repercussions of a lack of clarity on these questions are potentially enormous for DRC. If breastfeeding is wrongly discouraged, years of public health efforts to promote breastfeeding could be lost. Conversely, if breastfeeding is wrongly encouraged, many infants could be put at risk. The authors conclude that it is time to give as much attention to Ebola virus in breastmilk as we do in semen.

¹ Ververs, M. and Arya, A. (2019) Ebola virus disease and breastfeeding: time for attention. Correspondence. *The Lancet*, published online: August 27, 2019 [http://dx.doi.org/10.1016/S0140-6736\(19\)32005-7](http://dx.doi.org/10.1016/S0140-6736(19)32005-7)

Impact of reduced dose of ready-to-use therapeutic foods in children with uncomplicated severe acute malnutrition in Burkina Faso Research snapshot¹

A randomised non-inferiority trial was undertaken to investigate the efficacy of a reduced ready-to-use therapeutic food (RUTF) dose in community-based treatment of uncomplicated severe acute malnutrition (SAM) in Burkina Faso. Between October 2016 and July 2018, 801 children aged 6–59 months with uncomplicated SAM were enrolled from 10 community health centres and randomly assigned into one of two study arms: (a) a standard RUTF dose for two weeks, followed by a reduced dose thereafter (reduced); or (b) a standard RUTF dose throughout the treatment (standard). The mean weight gain velocity from

admission to discharge was 3.4 g/kg/day and did not differ between study arms (Δ 0.0 g/kg/day; 95% CI –0.4 to 0.4; $p = 0.92$), confirming non-inferiority ($p = 0.013$). No differences were found in length of stay or recovery rate between arms, nor in mid-upper arm circumference (MUAC) gain velocity. However, after two weeks, the weight gain velocity was significantly lower in the reduced dose, with a mean of 2.3 g/kg/day compared with 2.7 g/kg/day in the standard dose (Δ –0.4 g/kg/day; 95% CI –0.8 to –0.02; $p = 0.041$). The reduced RUTF dose also led to a small but significant negative effect, 0.2 mm/week (95% CI 0.04 to 0.4; $p = 0.015$), on height gain

velocity, with a mean height gain of 2.6 mm/week with reduced and 2.8 mm/week with standard RUTF dose. The impact was more pronounced in children under 12 months of age (interaction, $p = 0.019$). The authors recommend that a reduced-dose approach is tested in a routine programmatic setting and in different food-security contexts before scale-up.

¹ Kangas ST, Salpe 'teur C, Nikiéma V, Talley L, Ritz C, Friis H, et al. (2019) Impact of reduced dose of ready-to-use therapeutic foods in children with uncomplicated severe acute malnutrition: A randomised non-inferiority trial in Burkina Faso. *PLoS Med* 16(8): e1002887. <https://doi.org/10.1371/journal.pmed.1002887>

Individualised breastfeeding support for acutely ill, malnourished infants under six months of age Research snapshot¹

Re-establishing exclusive breastfeeding (EBF) is the cornerstone of the 2013 World Health Organization (WHO) treatment guidelines for the management of acute malnutrition in infants under six months old. However, the guidelines are inconsistently applied, with limited evidence of outcomes in infants both in inpatient and outpatient settings and on discharge. A recent study assessed the feasibility of using breastfeeding peer supporters (BFPS) to facilitate implementation of 2013 WHO guidelines among hospitalised malnourished infants under six months old and evaluated the outcomes (EBF, infant growth, morbidity and mortality up to six weeks post-discharge) in Kilifi County Hospital, Kenya.

Between September 2016 and January 2018, three BFPS provided individual breastfeeding

support to mothers of infants aged four weeks to four months admitted with an illness and acute malnutrition (mid upper-arm circumference < 11.0 cm OR weight-for-age z score (WAZ) < –2 OR weight-for-length z score (WLZ) < –2). Infants (n=51) were followed daily while in hospital, then every two weeks for six weeks after discharge.

Most enrolled mothers had multiple breastfeeding challenges, mainly relating to technique; poor positioning and attachment were observed in 78% and 76% of the mothers, respectively. Six per cent had no option to breastfeed. Delayed start to breastfeeding and perceived milk insufficiency were reported in 34% of the mothers. Almost half (43%) of the ill, malnourished infants had a history of small size at birth (low birth weight, premature or small for gestational age) and one third (35%) had a congenital malfor-

mation affecting feeding. The rate of exclusive breastfeeding was 55% on admission and 81% at discharge. At discharge, 67% of infants had attained the WHO recommended weight velocity of >5 g/kg/day for three consecutive days on breastmilk alone. Re-establishing EBF required time beyond medical recovery; extending inpatient admission to achieve feeding targets risked cross-infection. Gains in WLZ and WAZ were generally not sustained beyond two weeks after discharge.

The authors conclude that BFPS operated effectively in an inpatient setting and increased rates of exclusive breastfeeding at discharge. However, lack of sustained anthropometric gain post-discharge suggests the need for continued active intervention. Future studies need to explore integration of such support under 'real-life' health-service conditions and strategies for structured breastfeeding support on discharge to improve growth and ensure survival among recovering infants.

¹ Mwangome M, Murunga S, Kahindi J, et al. Individualized breastfeeding support for acutely ill, malnourished infants under 6 months old. *Matern Child Nutr*. 2019; e12868. <https://doi.org/10.1111/mcn.12868>

Conflict of interest in nutrition research

Research snapshot¹

All scientists have an academic conflict of interest (COI) in that the impact of their research, their ability to attract research funding, and perhaps keep their jobs, depend on their having research success. Most discussion about COI focuses on funding received from industry. The food industry has steadily increased its investment in externally targeted research; academics are drawn to such funds as they are less arduous to apply for, often offer a greater chance of being funded, and can lead to long-term funding collaborations. All industries work toward their own profit and the food industry is no exception. As a group of editors, the authors reflect on how to progress

the outcomes of industry-funded research that may lead to healthy debate within the nutrition community. In their view, a paper with a COI should be published if it has been internally and externally peer reviewed and meets the journal's standards. When a paper is received with a clearly declared COI that has an interesting hypothesis and that addresses an area of current debate or hopes to confirm the clinical benefits of a nutritional product (and that passes ethics and writing quality standards), the authors will categorise it as one of the following: (1) financed by industry with a clear declaration that the industry was not involved in the study hypothesis/ design, execution, analysis or interpretation; (2) sponsored

by industry with a clear declaration that industry was involved in the above, with industry involvement clearly outlined; (3) funded and conducted by industry with no external partners. Papers in categories (1) and (2) will need to demonstrate the transparency of industry funding, academic independence and public access to raw data. Once published, category (1) papers will appear as standard and categories (2) and (3) will appear under the subject category 'Industry Research'. This new subject category will signal papers with a strong but declared COI. The reader can then make a judgement on the veracity of the findings and the overall message of that paper.

¹ Soares, M.J., Müller, M.J., Boeing, H., Maffei, C., Misra, A., Muscogiuri, G., Muthayya, S., Newsholmes, P., Wolever, T., and Zhu, S. (2019). Conflict of interest in nutrition research: an editorial perspective. *European Journal of Clinical Nutrition* (2019) 73:1213–1215 <https://doi.org/10.1038/s41430-019-0488-8>

Association of early interventions with birth outcome and child linear growth in low-income and middle-income countries

Research snapshot¹

The first 1,000 days of life represent a critical window for child development. Pregnancy and the exclusive breastfeeding (EBF) (0-6 months) and complementary feeding (CF) periods have different growth requirements, so separate considerations for intervention strategies are needed. The purpose of this study was to determine the association of interventions with birth and linear growth outcomes based on randomised clinical trials (RCTs) of interventions under the domains of nutrition; deworming; maternal education; and water, sanitation and hygiene (WASH) provided to pregnant women, infants aged 0-6 months and children aged 6-24 months conducted in low and middle-income countries (LMICs) using Bayesian network meta-analyses. Random-effects meta-analyses were performed for each life period and odds ratios were compared on preterm birth and mean differences on birth

weight for pregnancy, length-for-age (LAZ) for EBF, and height-for-age (HAZ) for CF.

Among 302,061 participants in 169 RCTs, several nutritional interventions were found that demonstrated greater association with improved birth and growth outcomes compared with standard care. For instance, compared with standard care, maternal supplements of multiple micronutrients during EBF showed reduced odds for preterm birth (OR, 0.54; 95%CrI, 0.27-0.97) and improved mean birth weight (MeanDiff, 0.08 kg; 95%CrI, 0.00-0.17 kg) but not LAZ (MeanDiff, -0.02; 95%CrI, -0.18 to 0.14). Supplementing infants and children with multiple micronutrients showed improved LAZ (MeanDiff, 0.20; 95%CrI, 0.03-0.35) and HAZ (MeanDiff, 0.14; 95%CrI, 0.02-0.25). Interventions provided to pregnant women generally demonstrated greater associations with improved outcomes than interventions provided to infants and children at later periods.

Findings highlight the importance of intervening early to improve birth outcomes and counter childhood stunting. Findings also reveal that nutritional interventions, micronutrients and food supplements generally showed greater associations with improved outcomes than interventions from other domains. Despite the numerous clinical trials that have already been conducted, more research targeting less explored areas, such as maternal education and WASH, appears to be needed. Research is also needed that combines interventions from multiple domains and tests their effectiveness as a package.

¹ Park, J.J.H., Lan Fang, M., Harari, O., Dron, L., Siden, E.G., Majzoub, R., Jeziorska, V., Thorlund, K., Mills, E., Bhutta, Z. (2019). Association of Early Interventions With Birth Outcomes and Child Linear Growth in Low-Income and Middle-Income Countries: Bayesian Network Meta-analyses of Randomized Clinical Trials. *JAMA Network Open*. 2019;2(7):e197871. doi:10.1001/jamanetworkopen.2019.7871

Practical pathways to integrate nutrition and water, sanitation and hygiene

Research snapshot¹

Interviews were undertaken in Cambodia, Ethiopia and Madagascar and results analysed alongside research and experience of multiple agencies to highlight common entry points for governments and development partners to take integrated action on water, sanitation and hygiene (WASH) nutrition. Results highlighted the need to target WASH interventions to undernutrition hotspots ('convergence' or 'co-

location'); promote the integration of key hygiene behaviours in nutrition interventions; prioritise mothers, newborns and young children as targets for WASH interventions; deliver a minimum package of health, nutrition and WASH services and messaging; strengthen capacity and resourcing of service-delivery platforms and frontline health workers; and ensure regular vertical and horizontal coordination meetings between nutrition stake-

holders from local to national levels. Seven pathways to the success of integration efforts are identified (summarised in Box 1) and illustrated by country examples.

¹ WaterAid and Action Against Hunger (2019). *Practical pathways to integrate nutrition and water, sanitation and hygiene*. Available at washmatters.wateraid.org/practical-pathwaysnutrition-wash

Box 1 Pathways to success

1. Leadership: Secure the highest-level leadership, from the prime minister or president, to drive cross-ministerial coordination and hold line ministries to account for integration of WASH and nutrition.
2. Policies: First, ensure national and regional development plans take a multisector approach to integrating nutrition and WASH interventions, aiming to improve child nutrition. Second, ensure specific policies for nutrition and WASH are coordinated and cross-refer to one another.
3. Financing and strong government systems: Fully finance national WASH and nutrition plans, with clearly defined financing strategies across ministries that support better coordination.
4. Data: Governments and donors must prioritise investments in data systems to enable effective targeting and prioritisation, and reliable monitoring.
5. Sub-national coordination: Replicate strong national coordination mechanisms at sub-national level, ensuring 360-degree accountability.
6. Knowledge sharing: Local authorities, civil society organisations, non-governmental organisations and donors should prioritise documenting and sharing knowledge and experience from integrated WASH-nutrition projects to support governments to adopt and scale up models that work.
7. Accountability: Ensure transparency and accountability: this is key to driving multisector approaches.



WaterAid/Ernest Randa/malala

The WASH benefits and SHINE trials: interpretation of WASH intervention effects on linear growth and diarrhoea Research snapshot¹

Globally, stunting is the most prevalent form of child undernutrition and is only modestly responsive to dietary interventions. Numerous observational studies have shown that water quality, sanitation, and handwashing (WASH) in a household are strongly associated with linear growth of children living in the same household, which may be partially mediated through diarrhoea, but primarily through environmental enteric dysfunction. Three randomised efficacy trials (SHINE) were undertaken to test improved household-level WASH with and without improved infant and young child feeding (IYCF) on child stunting and diarrhoea in Bangladesh, Kenya, and Zimbabwe. SHINE was a two-by-two factorial trial with four groups: IYCF (counselling on complementary feeding and provision of small-quantity, lipid-paste-nutrient supplement); WASH (combined sanitation, water chlorination and handwashing with soap); IYCF combined with WASH; and standard care. In all trials, the IYCF intervention modestly but significantly increased mean length-for-age (LAZ) by 0.13-0.25 (about one eighth of the deficit of the average child aged 18-24 months). A significant relative reduction in diarrhoea of 31-40% was observed in the water-chlorination intervention under WASH Bangladesh only. In all three trials, the WASH interventions had no effect on linear growth, and providing WASH concurrently with IYCF had no additional benefit on linear growth compared with providing IYCF alone.

These findings are inconsistent with existing and often-cited observational evidence. Further analysis suggests baseline sanitation was a strong risk for stunting. However, the relationship between household WASH indicators and child linear growth may be confounded. The effect on diarrhoea in Bangladesh is likely due to the

regular visits to participating household (six times per month), compared to monthly in Kenya and Zimbabwe. Such intense contact is not possible at scale. The authors conclude that these trials were not effective enough in reducing the faecal-oral transmission of pathogens to result in linear growth and optimal health, with children having high rates of enteric infection. Future research should explore interventions that are radically more effective in reducing faecal contamination in the domestic environment ('transformative WASH') and, irrespective of intervention, strengthened support is required for governance systems of financing, operations, monitoring, evaluation, and regulation.

¹ Pickering, A.J., Null, C., Winch, P.J., Mangwadu, G., Arnold, B.F., Prendergast, A.J. et al (2019) The WASH benefits and SHINE trials: interpretation of WASH intervention effects on linear growth and diarrhoea. *Lancet Glob Health* 2019; 7: e1139-46

Soya, maize and sorghum-based ready-to-use therapeutic food with amino acid for treatment of severe acute malnutrition Research snapshot¹

Development of more cost-effective ready-to-use therapeutic food (RUTF) for the treatment of severe acute malnutrition (SAM) is a global public-health priority. To date, previous lower-cost recipes have been less effective than the standard peanut and milk (PM)-based RUTF, particularly in children aged less than 24 months. This study aimed to compare the efficacy of the PM-RUTF to a milk-free soya, maize, and sorghum (FSMS) RUTF enriched with crystalline amino acids without cow milk powder, and a milk, soya, maize and sorghum (MSMS) RUTF containing 9.3% skim cow milk powder, both of which provide a substantially lower cost alternative. A non-blinded, three-arm, parallel

group, simple randomised controlled trial was undertaken in 21 clusters of three health districts in central Malawi. Between September 2015 and June 2016, a total of 22,790 children were screened. Of these, 2,277 were diagnosed with SAM and 1,347 randomly assigned to either the FSMS-RUTF (n=454), the MSM-RUTF (n=435), or the PM-RUTF (n=458) study groups. Another 48 children were excluded from the study after randomisation (because consent was withdrawn or medical complications became apparent), after which 1,299 were finally included (795 aged 6-23 months and 504 aged 24-59 months). Those children with SAM who did not meet study criteria² received routine treatment from pre-existing outpatient therapeutic services.

In intention-to-treat analyses, FSMS-RUTF showed noninferiority for recovery rates in children aged 24-59 months (Δ : 21.9%; 95% CI: 29.5%, 5.6%) and 6-23 months (Δ : 20.2%; 95% CI: 27.5%, 7.1%) compared with PM-RUTE. MSMS-RUTF also showed noninferiority for recovery rates in children aged 24-59 months (Δ : 0.0%; 95% CI: 27.3%, 7.4%) and 6-23 months (Δ : 0.6%; 95% CI: 24.3%, 5.5%). Noninferiority in recovery rates was also observed in per-protocol analyses. For length of stay in the programme (time to cure), both FSMS-RUTF in children aged 24-59 months (Δ : 2.8 d; 95% CI: 20.8, 6.5 d) and 6-23 months (Δ : 3.4 d; 95% CI: 21.2, 8.0 d) and MSMS-RUTF in children aged 24-59 months (Δ : 0.2 d; 95% CI: 23.1, 3.6 d) and 6-23 months (Δ : 1.2 d; 95% CI: 23.4, 5.8 d) were not inferior to PM-RUTE. FSMS-RUTF was also significantly better than PM-RUTF at increasing haemoglobin and body iron stores in anaemic children, with mean haemoglobin increases of 2.1 (95% CI: 1.6, 2.6) and 1.3 (95% CI: 0.9, 1.8) and mean body iron store increases of 2.0 (95% CI: 0.8, 3.3) and 0.1 (95% CI: 21.1, 1.3) for FSMS-RUTF and PM-RUTF, respectively. The authors conclude that FSMS-RUTF without milk is efficacious in the treatment of SAM in children aged 6-23 and 24-59 months and is better at correcting iron deficiency anaemia than PM-RUTE.

¹ Bahwere, P., Akomo, P., Mwale, M., Murakami, H., Banda, C., Kathumba, S., Banda, Chimwemwe., Jere, S., Sadler, K. and Collins, S. (2017). Soya, maize, and sorghum-based ready-to-use therapeutic food with amino acid is as efficacious as the standard milk and peanut paste-based formulation for the treatment of severe acute malnutrition in children: a non-inferiority individually randomized controlled efficacy clinical trial in Malawi. *Am J Clin Nutr* 2017;106:1100-12.
² Based on home distance, age >59 months, mother pregnant, weight-for-height <3 but MUAC \geq 115mm and others.



Mother and child in Bangwe Health Centre, Blantyre, Malawi, 2012

WFP/David Orr

Understanding how Rwanda created an enabling environment for improvements in nutrition

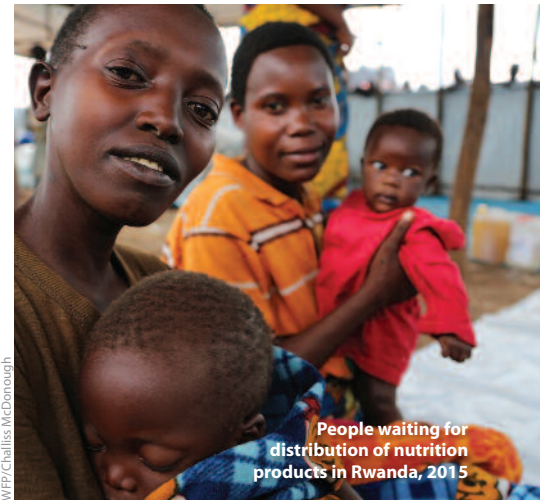
Research snapshot¹

Rwanda has made substantial progress in reducing malnutrition, with reductions in stunting and anaemia of 14 and 15 percentage points respectively between 2005 and 2015. However, stunting reduction has been uneven across the country and prevalence remains very high at 38%. To facilitate further progress, a 'stories of change' study was conducted to identify drivers of stunting and anaemia reduction and potential barriers and facilitators to future progress in Rwanda. Qualitative methods included semi-structured interviews with 90 key stakeholders in nutrition, and 40 focus-group discussions with community members in five districts that experienced reduction in stunting and five that did not. Quantitative data from Demographic and Health Surveys (2005, 2010 and 2015) were also analysed.

Key drivers of change based on the qualitative data were: leadership, peace and security and decentralisation of government; political commitment to nutrition and multi-sector programming, facilitated by national policy (in particular

the National Food and Nutrition Policy 2013-2018) and nutrition coordination mechanisms; and increased provision of community-level, nutrition-related services and programmes, especially in health and agriculture (e.g. nutrition counselling, antenatal care, kitchen-garden programmes). Quantitative data revealed that factors that contributed most to reduced stunting were related to maternal health, including quality of prenatal visits; proportion of women giving birth at a health facility; and the number of children a woman had. Household wealth, parental education and insurance coverage were also important.

Districts without reduced stunting had weaker horizontal and vertical coherence of policy and programming; less robust, multi-sector and integrated monitoring and evaluation for nutrition; and decreased food availability at community level. For further improvements, Rwanda must keep up the momentum of positive change and further strengthen existing plans, systems and approaches. Remaining challenges must also be addressed, including those around financial



People waiting for distribution of nutrition products in Rwanda, 2015

constraints; gaps in policy; institutional, horizontal and vertical coherence and monitoring and evaluation for nutrition; and community-level issues such as poverty, food security, gender relations and health, nutrition, and water, sanitation and hygiene practices.

¹ Iruhiriyi, Elyse; Olney, Deanna K.; Ramani, Gayathri V.; Heckert, Jessica; Niyongira, Emmanuel; and Frongillo, Edward A. 2019. Stories of Change: Rwanda: Understanding how Rwanda created an enabling environment for improvements in nutrition and the challenges that remain. Stories of Change Rwanda Program Brief 1. Washington, DC: International Food Policy Research Institute (IFPRI). <https://doi.org/10.2499/p15738coll2.133378>

Soya, maize and sorghum ready-to-use therapeutic foods (RUTF) are more effective in correcting anaemia and iron deficiency than standard RUTF

Research snapshot¹

The prevalence of anaemia and iron deficiency (ID) among children with severe acute malnutrition (SAM) and their correction during nutritional rehabilitation are not well documented. A randomised controlled trial was undertaken in central Malawi among children with SAM age 6-59 months (n=389) to assess anaemia and ID prevalence and their predictors at the start of SAM treatment, and the efficacy of their treatment and effect on gut health of two novel ready-to-use therapeutic foods (RUTF) prepared from soybean, maize and

sorghum (SMS) with (MSMS-RUTF) or without added milk (FSMS-RUTF) compared to those of the standard formulation prepared from peanut and milk (PM-RUTF). All the RUTFs were designed to meet the World Health Organisation (WHO) recommendations for RUTF mineral and vitamin levels with the exception of iron and zinc. Iron, zinc and vitamin C levels in FSMS-RUTF and MSMS-RUTF were increased to attain a phytic acid / iron molar ratio, ascorbic acid / iron weight ratio and zinc / iron weight ratio of < 2.5, 3.0- 16.0 and 0.8-3.5, respectively to enhance iron and zinc absorption.

A total of 386 children were surveyed on admission (227 of whom were under 24 months of age and 165 over 24 months); 266 of whom were also assessed at discharge. At admission, the prevalence (%(95%CI)) of anaemia was 48.9(41.4-56.5)%, while that of ID and IDA were 55.7(48.6-62.5)% and 34.3(28.2-41.0)% when using soluble transferrin receptor (sTfR) criterion and 29.1(24.4-34.4)% and 28.9(23.7-34.9)% when using body iron stores (BIS) criterion, respectively. Results, presented in Table 1, show a linear trend in the prevalence of anaemia and iron-deficiency anaemia related to the milk content of the RUTF, with the prevalence lowest

in the FSMS-RUTF and highest in the PM-RUTF. This trend was seen in both those with and without anaemia at admission. A similar trend was observed when comparing haemoglobin change between admission and discharge. SMS-RUTF was also associated with the highest increase in BIS among the iron-depleted at admission (6.2mg/kg (3.7-8.6) for FSMS-RUTF; 3.2mg/kg (0.8-5.6) for MSMS-RUTF; and 2.2mg/kg (0.2-4.3) for PM-RUTF) (p=0.045). Compared to PM-RUTE, FSMS-RUTF had the highest adjusted recovery rate (OR (95%CI) = 0.3 (0.2-0.5) with p < 0.001 for FSMS-RUTF and 0.6 (0.3-1.0) with p = 0.068 for MSMS-RUTF). No effect of iron content on risk of iron overload or gut inflammation was observed. This study found that anaemia including IDA is common among children with SAM. The authors conclude that FSMS-RUTF with a higher level of iron and no cows milk is more efficacious in treating anaemia and correcting BIS in this group of children than standard RUTF.

¹ Akomo, P., Bahwere, P., Murakami, H., Banda, C., Maganga, E., Kathumba, S., Sadler, K. and Collins, C. (2019) Soya, maize and sorghum ready-to-use therapeutic foods are more effective in correcting anaemia and iron deficiency than the standard ready-to-use therapeutic food: randomized controlled trial. BMC Public Health 19:806

	N	%(95%CI)	p-value
<i>Prevalence of anaemia at discharge</i>			
FSMS-RUTF	83	12.0(6.9-20.3)	p=0.023
MSMS-RUTF	77	18.2(11.9-26.8)	
PM-RUTF	106	24.5(15.8-35.9)	
<i>Prevalence of IDA at discharge</i>			
FSMS-RUTF	63	7.9(3.4-17.3)	p=0.028
MSMS-RUTF	46	10.9(4.8-22.6)	
PM-RUTF	83	20.5(10.7-35.5)	

* measured by sTfR criterion (less affected by inflammation)

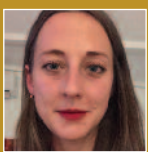


Mothers gather at a Mother Baby Area for IYCF support, Cox's Bazar, Bangladesh, 2019

Alice Burrell, Save the Children International

Challenges in protecting non-breastfed infants in the Rohingya response in Bangladesh

By Alice Burrell



Alice Burrell is a public health nutritionist with five years of experience working in the nutrition sector in multiple countries, mainly on infant and young child feeding in emergency (IYCF-E) programming. Alice previously worked for Save the Children's humanitarian response team as a nutrition advisor, where she worked in the Rohingya response. She now works with GOAL as the 'management of at risk mothers and infants under six months' (MAMI) advisor.

The author would like to acknowledge the Save the Children Bangladesh nutrition team, especially those working on the Rohingya response for their dedication and hard work in delivering the support discussed in this article. She would like to thank the IYCF technical working group in Cox's Bazaar for advocating for better support for infants and initiating important related initiatives and discussions. The author also wishes to thank Caroline Wilkinson, United Nations High Commission for Refugees (UNHCR) for her review of this article and Alessandro Iellamo, IYCF Advisor at Save the Children UK, for his technical guidance and support.

Location: *Bangladesh*

What we know: Non-breastfed infants require timely identification, protection and support in emergencies.

What this article adds: A 2017 SMART survey of refugee camps in Cox's Bazaar revealed low levels of exclusive breastfeeding in infants under six months, with 1.4 – 2.3% never having been breastfed. Save the Children International (SCI) efforts to support non-breastfed infants through wet nursing and relactation (including piloting home-based supplementary suckling support for two infants) as part of a comprehensive package of infant and young child feeding in emergency interventions were challenged by a lack of relevant operational guidance, capacity and practical limitations. For those who chose to or had to adopt artificial feeding as a last resort, a safe, sustained supply of breastmilk substitutes (BMS) in line with international recommendations was not available; SCI and United Nations High Commission for Refugees (UNHCR) proposals to address this were not validated by the Nutrition Sector. SCI reduced risks to affected infants through provision of safer BMS kits, counselling and close follow up. Interim operational guidance on the management of non-breastfed infants has been developed by SCI, UNHCR and UNICEF for the Rohingya response but is not yet endorsed by government; there is still no safe BMS programming for the population. Guidance, tools, capacity, resources and mechanisms for the safe supply of BMS and effective support for wet nursing and re-lactation in emergencies are urgently needed to translate international recommendations into practice to support this vulnerable group.

Background

Recommended infant and young child feeding (IYCF) practices greatly benefit the health of children and their mothers. Breastfeeding could save the lives of an estimated 823,000 children under five years and 20,000 women annually (Victora et al, 2016). In emergencies, disrupted access to healthcare; food; water, sanitation and hygiene (WASH) facilities and a lack of privacy to breastfeed can compromise IYCF practices. Additionally, heightened stress levels, traumatic experiences, disrupted support networks and increased time required for daily tasks can negatively impact mothers' mental health, care and breastfeeding practices. Sub-optimal IYCF practices put young children at risk of acute malnutrition, stunting and

micronutrient deficiencies, with the youngest being the most vulnerable. Therefore, protecting, promoting and supporting recommended IYCF practices and minimising associated risks around feeding and care are crucial to child survival, nutrition and development in emergency contexts.

IYCF interventions in both emergency and development settings should align with key policy guidance, such as the Global Strategy for Infant and Young Child Feeding (WHO and UNICEF, 2003); the International Code of Marketing of Breastmilk Substitutes (WHO, 1981) and subsequent relevant World Health Assembly (WHA) Resolutions ("the Code"); and the Operational Guidance on IYCF in

Field Article

Emergencies (OG-IFE), endorsed by the WHA (IFE Core Group, 2017). These documents provide key guidance and recommendations around the support, promotion and protection of IYCF for all children and their mothers.

Recent emergencies, such as the Syrian crisis (Mboya, 2014) and European migrant crisis (Modigell, Fernandes and Gayford, 2016) have highlighted the needs of non-breastfed infants in emergencies. The World Health Organization (WHO)/UNICEF Global Strategy for Infant and Young Child Feeding emphasises that not being breastfed for the first six months of life is a risk factor for malnutrition, illness and mortality. In emergencies, non-breastfed infants require timely identification and specialised support. The OG-IFE reaffirms this principle, highlighting mandated United Nations (UN) roles (UNICEF/UNHCR) for the protection and support of non-breastfed infants, including ensuring appropriate supplies of breastmilk substitutes (BMS) and associated support services. At an agency level, this is reflected in UNICEF's Core Commitment to Children in Humanitarian Action (2010)¹ and Standard Operating Procedures (SOPs) on the handling of breastmilk substitutes, developed by both UNHCR (2015) and UNICEF (2018, updated pending 2019).

The Rohingya response saw significant challenges and shortfalls in the protection and support of non-breastfed infants, which are critical to examine and address and are shared in this article.

The Rohingya crisis

In August 2017, intense violence in Rakhine State Myanmar led Rohingya people to flee to neighbouring Bangladesh. As of 12 December 2018, 908,000 Rohingya people were residing in makeshift settlements and camps in Cox's Bazar, Bangladesh. Over 700,000 of these had arrived since the 25 August 2017 (IOM, 2018). The population was and remains highly dependent on humanitarian aid and, due to exposure to traumatic events, many remain in need of medical and mental health/psychosocial support. The potential outbreak of contagious diseases given the low health status of the population, severely crowded conditions in the settlements, and poor water and sanitation are serious concerns. The estimated proportion of children under five years and pregnant and lactating women (PLW) is 29% and 10% respectively. As of October 30 2017 there was an estimated total of 8,129 infants less than six months old among those displaced (RRRC-UNHCR, 2017).

Nutrition coordination

The humanitarian response is led and coordinated by the Government of Bangladesh. Following the influx, the Refugee Relief and Repatriation Commissioner (RRRC), under the Ministry of Disaster Management and Relief (MDMR), was mandated to provide operational coordination for all refugees/Forcibly Displaced Myanmar Nationals (FDMNs).² For humanitarian agencies, strategic guidance and national-level government engagement is provided by the Strategic Executive



Household counselling session on hygiene of the Supplementary Suckling Technique Kit, Cox's Bazar refugee camp, Bangladesh, 2018

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Group (SEG) in Dhaka, co-chaired by the Resident Coordinator, International Organisation for Migration (IOM) and UNHCR. At district level, the Senior Coordinator leads the Inter-Sector Coordination Group (ISCG), composed of thematic Sector and Working Group Coordinators representing the humanitarian community.

The nutrition response in Cox's Bazar is led by the Nutrition Sector, chaired by the Ministry of Health and Family Welfare (MoHFW) in collaboration with UNICEF. The response plan focused on treatment and prevention of acute malnutrition with specific interventions including community-based management of acute malnutrition (CMAM) for children aged 6-59 months and PLW, IYCF in emergencies (IYCF-E)³ including one-to-one and group counselling and community-based management of at risk mothers and infants under six months old (C-MAMI).⁴

Assessment of need

Results of SMART surveys in October and November 2017 in Kutupalong, Makeshift and Nayapara camps raised serious concerns. Prevalence of global acute malnutrition (GAM) was found to be at crisis levels at 24.3%, 19.3% and 14.3% respectively, with severe acute malnutrition (SAM) prevalence at 7.5%, 3.0% and 1.3% respectively (AAH, 2017). Results also showed worrying IYCF practices with 17.9%, 43.9% and 27.8% of infants under six months old in the respective camps not exclusively breastfed and between 1.4% and 2.3% of children aged 0-23 months across all camps never breastfed (an estimated total of 167 infants). In addition, a very low proportion of children aged 6-23 months were receiving a minimum acceptable diet (MAD) (8.8%, 6.4%, and 15.7% respectively).

Follow up SMART surveys conducted in April and May 2018 indicated a marked improvement in GAM in Makeshift camp from 19.3% to 12.0%, with less improvement in Nayapara camp from 14.3% to 13.6% (AAH, 2018). The survey was not repeated in Kutupalong camp. However, IYCF practices showed no improvement; in Makeshift camp the proportion of non-breastfed infants

increased from 1.4% to 3.4% and exclusive breastfeeding reduced from 56.1% to 50.0%. When applied to population numbers, this indicates a significant number of children needing identification, management and support. In addition to those infants never breastfed, there were likely additional infants under six months whose caregivers had stopped breastfeeding prior to six months; these non-breastfed infants are not captured in the survey results.

Save the Children's nutrition response

Save the Children (SCI) nutrition response involved establishing Nutrition Centres with an Outpatient Therapeutic Feeding Programme (OTP) for acutely malnourished children aged 6-59 months and Mother Baby Areas (MBAs) for IYCF-E support; IYCF-E corners in targeted Supplementary Feeding Programmes (TSFPs) and Blanket Supplementary Feeding Programmes (BSFPs); and piloting the C-MAMI tool⁵ to cater for infants aged less than six months at nutritional risk in select sites. SCI also responded with interventions in health; education; child protection; WASH; shelter; food security and livelihoods.

IYCF-E response

SCI was a key agency in the IYCF-E response, leading implementation of the IYCF Framework

¹ https://www.unicef.org/publications/files/CCC_042010.pdf

² The Government of Bangladesh refers to the Rohingya as "Forcibly Displaced Myanmar Nationals" (FDMN). The UN system refers to this population as "Rohingya refugees" in line with the applicable international framework for protection and solutions, as well as the resulting accountabilities for the countries of origin and asylum in addition to the international community as a whole. These terms refer to the same population.

³ IYCF focuses on improving practices, whereas IYCF-E focuses on doing no harm, minimising risks and protecting practices, and may require artificial feeding support that is not usually a component of routine IYCF programmes.

⁴ C-MAMI is an approach to identify and manage at risk mothers and infants under six months in the community who are nutritionally vulnerable. The C-MAMI Tool can be accessed at <https://www.enonline.net/c-mami>

⁵ The community based management of at risk mothers and infants under six months (C-MAMI) tool was developed to inform case management of this age group. www.enonline.net/c-mami

with UNHCR⁶ to support multiple sectors to create an infant and young child friendly environment and facilitate optimal IYCF in this emergency.

SCI also led the development of the initial IYCF-E response plan and supported all Nutrition Sector IYCF-E initiatives, including coordination and technical leadership and chairing the IYCF technical working group (TWG) for an assigned period. SCI led a quality-monitoring initiative, providing IYCF-E supervisors to the collective to facilitate supportive supervision, training and other capacity building initiatives. SCI also supported the Nutrition Sector to ensure that all stakeholders considered IYCF-E and prioritised the needs of infants and young children across the response.

SCI established Mother Baby Areas (MBAs) with trained IYCF-E counsellors to provide IYCF-E assessment, counselling and group sessions and a private space to breastfeed. Support for non-breastfed infants was provided on a one-to-one basis, usually at the household level, given the relatively low caseload and sensitivities around the demonstration of the safe preparation of infant formula. MBAs were established within Nutrition Centres, which also housed OTPs and, in some locations, a C-MAMI programme (Kueter et al, 2018). Nutrition centres were located next to SCIs health clinics where possible to facilitate easy referrals and linkages between the various services.

IYCF-E supervisors and counsellors were recruited locally and trained on IYCF-E counselling over two days, including on wet nursing, relactation, cup feeding and risks of formula use (with supervisors given an additional day's training on MBAs and supervision). On-the-job coaching on counselling for BMS use was provided as cases arose, rather than through formal training, due to sensitivities around the topic. IYCF-E counsellors conducted rapid IYCF assessments for all identified caregivers with children under two years old; if a feeding issue was identified they then conducted a full IYCF assessment and developed a counselling care plan. Caregivers of children under two years old were mainly identified through community outreach activities by SCI's counsellors and community mobilisers. Health and nutrition facilities and protection teams also referred caregivers of children under two years old with feeding difficulties to the MBA.

Challenges managing non-breastfed infants

Serious challenges were encountered in the management of non-breastfed infants due to limited guidance on the support of wet nursing and relactation in emergency settings and the lack of agreed and coherent policy and implementation plans on the support of non-breastfed infants less than six months old with artificial feeding when wet nursing and relactation were not feasible.

Wet nursing

There is a paucity of documented experiences



A grandmother is taught how to cup feed her granddaughter after the mother passed away after a wet nurse was found but moved out of the camp, Cox's Bazar, Bangladesh, 2019

Daphnee Cook, Save the Children International

on the support for wet nursing in emergency situations (Teshome, 2019). Experiences documented by UNHCR in 2008 found wet nursing to be acceptable in the Rohingya population (Sfeir, 2008). Challenges experienced by SCI in the Rohingya response included identifying wet nurses if unavailable among close relatives; relocation of wet nurses; acceptance by the wet nurse's family and expectation of incentives; poor access to nutritious and adequate foods for lactating women; practicality of the arrangements between infant carers and wet nurses to support exclusive breastfeeding; and preference for use of BMS when it was accessible to the family.

Relactation

SCI could not source guidance on the operationalisation of relactation relevant for refugee camps and settlements in Cox's Bazar. Available guidelines focused on relactation during inpatient care (ACF International, 2012), but this was often impossible for caregivers in this context due to high opportunity costs and multiple children to care for. Additionally, SCI did not support inpatient facilities and MBAs were an unsuitable place to conduct the Supplementary Suckling Technique (SST) due to sensitivities around the use of infant formula and risks of discouraging other caregivers from breastfeeding. Lastly, considering the limited geographical scope of SCI's programme and dispersion of identified cases of non-breastfed infants (<1% of infants under six months old assessed by SCI, over 10 operational areas, were not breastfed) it was not operationally viable to create a separate establishment for this purpose within each camp.

Given these considerations, SCI piloted home-based SST support for two infants whose mothers were willing to attempt relactation and where it was considered the most sustainable, safest option. Specific challenges that arose in supporting these two cases were limited guidance on reducing the supplement once breastmilk production began; maintaining caregiver motivation for re-lactation; keeping good hygiene of equipment within poor household hygiene and environment; lack of team capacity to conduct regular household support visits; and lack of household capacity to support SST. It was also

difficult to provide home-based support to referred infants residing in camps where SCI was not operational.

BMS programming

Major challenges were encountered when non-breastfed infants began to be identified and wet nursing and/or relactation was either ineffective, inappropriate or not accepted. Most non-breastfed infants were detected either by the child protection case management team, the UNHCR protection team and medical teams in health facilities, or were among those infants referred by SCI community mobilisers to the C-MAMI site or MBA for assessment. From the start of the response, SCI engaged the Nutrition Sector and partners to seek support to initiate a safe BMS supply programme in full compliance with national laws, regulations and recommendations. An initial joint proposal from SCI and UNHCR to provide the necessary support to families and a supply of BMS and associated materials for the small number of non-breastfed infants identified was never validated through the Nutrition Sector.

In Bangladesh, breastfeeding is strongly supported both through cultural practices and official legislation, such as the Bangladesh Act 2013 and the national IYCF strategy (IPHN, DGHS, MoHFW and GoB, 2007). Current national regulations recognise that a minority of infants may need BMS support, but no guidance and directions are provided on the operationalisation of this support in a humanitarian context. At the same time, the Nutrition Sector's experience and capacity needed strengthening in these areas. There was also a lack of accurate data on the caseload of non-breastfed infants,⁷ which made it difficult for agencies responsible to decide if they would financially support the supply of BMS and accompanying materials for safer preparation in the context of the response.

⁶ www.unhcr.org/publications/operations/5c0643d74/infant-young-child-feeding-refugee-situations-multi-sectoral-framework.html

⁷ There was an effort to collect an estimate of non-breastfed infants through the IYCF TWG, however agencies experienced challenges in collecting this data from the field teams and some data received was inaccurate and required follow up.



Household counselling session on the Supplementary Suckling Technique, Cox's Bazar refugee camp, Bangladesh, 2018

Daphnée Cook, Save the Children International

Given these factors, no supply chain for an appropriate BMS for the response (such as providing cash or vouchers to purchase BMS) was provided or made available to families of non-breastfed infants for whom BMS was indicated. While SCI had the resources, there was no government or UN approval to source infant formula and the necessary UN supply chain was not established. When families chose or needed to use BMS as a last resort, SCI reduced risks by providing a safer BMS kit (thermos flask, preparation utensils, feeding cup, and washing materials); counselling on safe and appropriate type and use of BMS; close follow up with home visits; and information to the family on risks associated with not breastfeeding and using BMS, especially in an emergency context.

Attempts to address barriers – policy and guidance

The situation reveals gaps and barriers from policy and regulatory level down to programme level that prevent a prompt and effective response and continues to compromise the protection of vulnerable infants. Dialogue with partners and authorities prompted the development and proposal of an interim Operational Guidance for the non-breastfed infant for the Rohingya response. This process began in December 2017, led by SCI with the support of other partner agencies, including UNICEF and UNHCR, and entailed several rounds of review. Sections were included on identification, referral, management

(including wet-nursing, relactation and BMS provision and support for safe use) and technical capacity building. The guidance was presented to the IYCF-E TWG for endorsement, the Civil Surgeon of Cox's Bazar for approval, and the Nutrition Sector. Reviewers requested more details, data and better clarity of roles and responsibilities. In June 2018, the finalised interim guidance was presented to the national Nutrition Cluster, presided over by the Institute of Public Health within the Ministry of Health. The guidance was neither rejected nor approved and, at time of writing, no further progress has been made. The Government simultaneously developed and finalised national IYCF-E guidelines for Bangladesh, which also remains under review. Both the interim Operational Guidance and national IYCF-E guidance are critical for current and future responses but are, as yet, unavailable.

Conclusions

The experiences documented here highlight a failure to translate global guidance into practice. Concrete guidance and coherent regulations are needed that allow for timely and safe interventions to protect, promote and support recommended and safe IYCF practices for all infants and young children affected by an emergency. However, the current lack of operational guidance for managing the non-breastfed infant in emergencies with wet nursing or relactation means that humanitarian organisations do not have essential tools they need to manage the most vulnerable infants.

While it is important to ensure that all mothers are enabled to breastfeed or that infants can receive breastmilk feeding as a safe alternative, there is sometimes a need for the provision of a BMS, as recognised by international guidance. Agency and country-level protocols, guidance and tools are needed to ensure that skills, capacity and resources are in place at the national level to manage the feeding of these infants as needs arise.

Current systems are inadequate for supporting the operationalisation of BMS programmes. There are no clearly defined mechanisms to access safe BMS and necessary equipment in the humanitarian sector and a pipeline for these products does not exist; hence humanitarian agencies have no standardised and systematic way to manage non-breastfed infants for whom BMS is indicated. International leadership by UN agencies is not always aligned from headquarters to country levels on this issue. Advocacy and sensitisation must therefore continue to ensure that national and regional-level offices have a common understanding and vision of mandated responsibilities for the management of non-breastfed infants among the key humanitarian nutrition response interventions.

Mechanisms for BMS support need to be further developed at national level to ensure timely and responsive availability in an emergency setting when required. Training modules on safe BMS programming should be developed and adapted to different contexts and scenarios, learning from best practices globally. Protocols and guidance for procurement, transportation, logistics, stocking, distribution, targeting and utilisation may be partially available, but need to be updated to reflect learnings and best practices and translated to more user-friendly tools for field practitioners. IYCF-E core indicators are available to assess the need for safe BMS programming, but are rarely used. More advocacy and sensitisation on how to accurately collect and use such data is required.

At time of writing there is still no safe BMS programming in place in Cox's Bazar for the infants who need it.

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International Medical Corps strengthens nutrition alert and surveillance systems in South Sudan

By Muhammad Ali Jatoi, Deepak Kumar, Dugsiye Ahmed and Iris Bollemeijer



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People of Uror County, PIERI, South Sudan, 2019

Gabriella Vaccua

Location: South Sudan

What we know: Nutrition surveillance is needed to provide timely, reliable data to monitor population nutrition status and inform programme interventions and decision-making.

What this article adds: In 2015 International Medical Corps (IMC) established a Nutrition Alert and Surveillance Strengthening (NASS) team to support the Food Security and Nutrition Monitoring System (FSNMS), the primary national information system, and Integrated Food Security Phase Classification (IPC). Priority areas are determined by the Nutrition Information Working Group (NIWG), under the leadership of the Nutrition Cluster. By January 2019, 52 multiple-type surveys had been conducted in IMC operational and non-operational areas to inform IPC analysis and programme interventions. The team also provided technical support and capacity-building to government and other partners (training 1,182 individuals). Lessons learned include the need for thorough planning and preparation pre-survey; good communication and coordination within and outside the organisation; investment in team capacity-building and supervision for collection of high-quality data; and necessity for a multi-sector approach in data analysis. The 2019-2021 strategy includes plans to further build the capacity of the IMC surveillance team; mobilise funds for a centralised, online surveillance data hub; increase support for country-wide surveys; and introduce cost-recovery for surveys in IMC non-operational areas.

Background

South Sudan is currently facing a period of severe food insecurity. Approximately 5.24 million people (of an estimated population of 11 million) were projected to be severely food insecure in the first quarter of 2019, of whom 36,000 were estimated to be at risk of famine.¹ While the situation is no longer deteriorating significantly, the country remains in the grip of a serious humanitarian crisis. Nearly 4.5 million people have been displaced, including approximately 2.5 million to neighbouring countries.

Maternal and child malnutrition is a significant public health as well as a social and economic problem in South Sudan. An estimated 17.1% of children aged 6-59 months are stunted, 10.6% are moderately acutely malnourished and 2.7% are severely acutely malnourished.² A complex web of multi-sector factors contribute to this burden, including poor maternal and childcare practices (especially sub-optimal infant and young

child feeding (IYCF) practices), high prevalence of low birth weight, inadequate dietary intake, food insecurity, unsafe water and poor sanitation, inadequate health services, high prevalence of morbidity, low levels of education and socio-economic challenges. There are severe challenges in addressing the burden arising from inadequate health services, poor access to health and nutrition services due to long travel distances, and displacement due to insecurity and higher food prices.

International Medical Corps (IMC) has been working in South Sudan since 2011 and in southern Sudan since the mid-1990s. The organisation currently operates in five of the country's 32 states, providing healthcare, psychological support, nutrition services and gender-based violence prevention. The nutrition programme provides services to internally displaced people (IDPs), refugees and host

¹ Integrated Food Security Phase Classification (IPC), September 2018.

² Food Security and Nutrition Monitoring System (FSNMS) Round 22 report published in December 2018.

communities in three states, including Malakal County of Upper Nile State (Malakal Protection of Civilian (POC) site; Malakal town and Maban refugee camps) (Integrated Phase Classification (IPC) Phase 4); Nyal-Panyijar County in Unity State (IPC Phase 4); and Juba County POCs in the Central Equatoria region (IPC Phase 3).

Nutrition-surveillance system needs

The government-United Nations (UN) Food Security and Nutrition Monitoring System (FSNMS) is currently the only nationwide nutrition-surveillance system in the country. Non-governmental organisation (NGO)-implemented location-specific SMART surveys are also regularly undertaken. The Nutrition Information Working Group (NIWG), under the leadership of the Nutrition Cluster, identifies priority areas for surveys to fill gaps in knowledge to inform the IPC and FSNMS to strengthen the national information system and identifies responsible partners to carry them out.

Until 2015, NGO and FSNMS surveys and assessments were normally carried out by external consultants, who often lacked a thorough understanding of the context. Surveys were often not completed on time due to the lengthy process of consultant recruitment and visa application and were rushed as consultants' visas were generally restricted to one month. These factors often compromised the quality of survey data and meant that partner staff were left to defend the results during NIWG validation. Consequently, some surveys were rejected and valuable resources wasted.

With the escalation of conflict during 2015 in Upper Nile, Lake and Unity States and worsening trade situation in the country overall, accurate monitoring of nutrition status, nutrition coverage and childcare practices became essential to ensure that interventions were guided by

valid and timely information. Nutrition data was also needed to accurately determine food security and nutrition phase classification of the country after 2014, when the IPC was introduced. In response, IMC implemented a new nutrition-surveillance initiative in 2015 to support wider surveillance needs and demands.

IMC's surveillance strengthening

IMC's Nutrition Alert and Surveillance Strengthening (NASS) team was established in August 2015 to undertake nutrition surveys and assessments to provide robust information to inform the design and implementation of appropriate nutrition interventions in South Sudan. The team comprises international and national staff, including two surveillance managers, two senior surveillance officers and four nutrition-surveillance officers. When needed, validated local enumerators are also hired on an ad hoc basis from an IMC database of 1,200 members; the majority of whom have already been contracted and have undertaken several surveys for IMC. This widespread team enables multiple nutrition surveys to be carried out simultaneously.

Surveys undertaken by IMC

The majority of surveys conducted by the surveillance team to date have been SMART surveys. However, the team has increased its technical capacity to conduct coverage assessments (SQUEAC); IYCF assessments; knowledge, attitude and practice (KAP) surveys; and barrier analyses (BA). Surveys are conducted in IMC operational sites and in counties with nutrition emergencies identified as priority areas for information by the NIWG of the Nutrition Cluster, government, or partners. So far, the NIWG has requested IMC to conduct 16 SMART surveys and four emergency assessments (two rapid-response mechanism (RRM) assessments and two initial rapid-needs assessments (IRNA)) in areas where IMC is not operational. In October 2018, the NIWG formally identified three partners

(IMC, Save the Children and Action Against Hunger) to be responsible for nutrition surveys and assessments in South Sudan based on their experience, including quality of data, timely provision of results, cost-effectiveness and overall organisational capacity.

IMC has conducted the most surveys to date among all partners and has been selected to carry out the vast majority planned for 2019. The team has also participated in the review and validation of multiple surveys conducted by other Nutrition Cluster partners and has provided feedback to enable the effective analysis of data. Partners with limited or no capacity to conduct surveys or assessments also asked IMC for support in carrying out surveys of their own; previously these organisations hired consultants to conduct surveys but lacked in-house capacity to validate them.

IMC has established relationships with key stakeholders such as the Ministry of Health (MoH), the Nutrition Cluster, relevant UN agencies and other partners and shares updated and reliable information with them as needed. All IMC surveys have been validated by the NIWG and have been found to be of good quality and to reflect the situation of the area assessed. IMC surveys are regarded in South Sudan as a trusted source of information, and data are often shared in national and international forums.

Survey process

Whether conducted for IMC or partners, the survey process is similar. The surveillance team develops a survey protocol according to internationally recognised methodologies (whether a SMART, SQUEAC, KAP, IYCF or BA survey), which is then validated by the NIWG. On approval, enumerators are trained by senior surveillance officers on the specific questionnaires, tools and sampling frame. During the data collection period, surveillance officers discuss results and any challenges with the enumerators daily. The data is digitally collected through software solutions such as ODK or KOBO using tablets to support accuracy and speed. Surveillance managers analyse the data in Juba, after which a draft report is prepared and submitted to the NIWG within two weeks for review and validation. NIWG meetings are held on a monthly basis and the validation process takes a maximum of two weeks. The final report is then submitted to the NIWG for dissemination within the Nutrition Cluster (the County Health Director, State Ministry of Health, MoH and IMC), as well as to relevant donors.

Costs, funding and capacity

The average cost of a survey ranges from USD9,000 to USD12,000 in IMC operational areas and from USD15,000 to USD20,000 in non-IMC operational areas. Costs are directly related to access and available services in geographical areas. For instance, if a county has no functional market, all supplies must be carried from Juba to the survey area, which escalates costs.

From 2015 to 2018, IMC's NASS received funding from the Office of U.S. Foreign Disaster

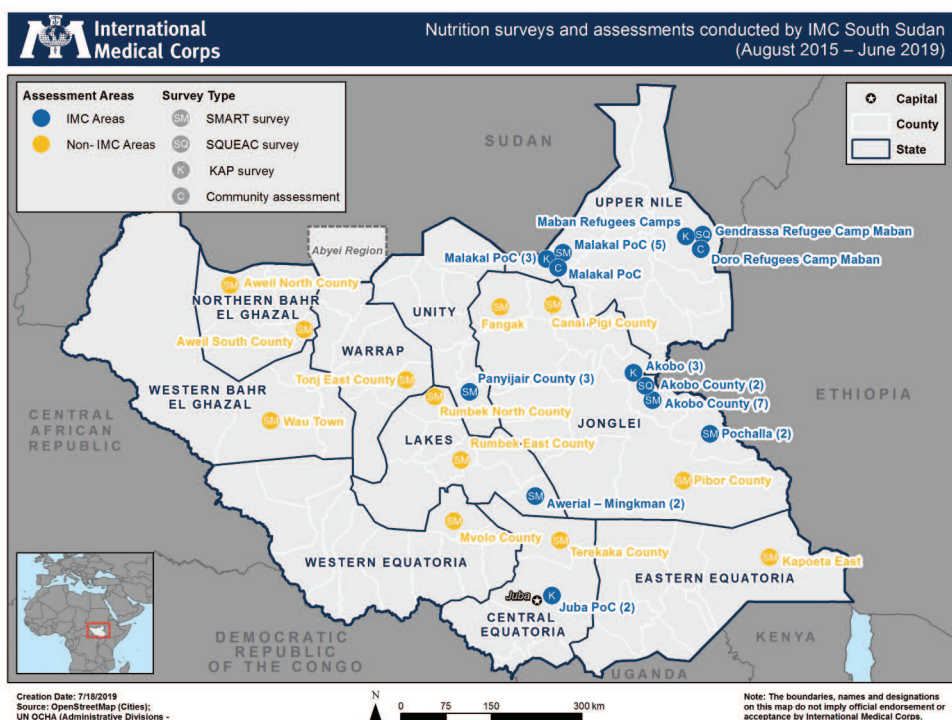
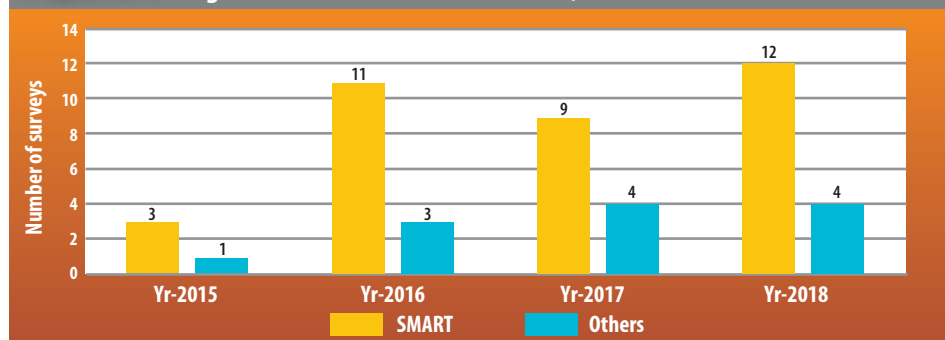


Figure 1 Number of children with severe acute malnutrition age 6 to 59 months targeted and reached in South Sudan, 2014-2018



Assistance (OFDA) and the United Nations Children's Fund (UNICEF), but since 2019 the team has been solely funded by USAID and is therefore currently in need of funding assistance. A new partnership agreement with UNICEF is currently being discussed and IMC will continue conducting nutrition surveys/assessments to ensure adequate availability of information. This information will be vital in decision-making and to increase nutrition-service interventions. The MoH is currently working to introduce District Health Information Software 2 (DHIS2)³ in South Sudan; this will capture the results from these assessments and will make the information more easily available to partners for use in decision-making and programme design.

NASS team challenges and lessons learned

South Sudan is a country with many challenges, making it crucial to plan for multiple scenarios. Operations can be severely affected by the prevailing security and political situation and in many parts of the country the situation is fluid. The surveillance team takes appropriate precautionary measures during planning and implementation stages to deal with such challenges. However, situations can easily change during data-collection periods. Delays are also common (for example, in procurements and simple arrangements on the ground, particularly in IMC non-operational areas). There is also a lack of accurate population data in the country. The most recent census was undertaken in 2008 and no census is currently planned. This makes case-load projections difficult, ultimately resulting in over- or underestimation and over- or underutilisation of financial resources.

Gradually and with experience, the surveillance team has learnt to overcome challenges to avoid delays and ensure quality surveys. Lessons learned by the surveillance team include:

Planning and preparation

In the South Sudan context it is necessary to start planning and consulting partners long before the survey takes place to mitigate risks and avoid unnecessary delays. All available options should be considered to enable smooth logistics arrangements and the MoH, NIWG and all partners on the ground should be consulted at planning stage to provide the necessary approvals and guidance. It is also important to remember that on-the-ground partners and stakeholders can provide

additional support, such as accommodation and communication services. A clear, concise and concrete survey protocol should be prepared well in advance, specifying clear inclusion and exclusion criteria, sample size, sampling frame, methodology and sample selection.

Coordination within and outside the organisation

Before proceeding to the field, all relevant permissions should be secured from the authorities. The team should also coordinate with on-the-ground partners or field logistics to understand the availability of items in local markets to save costs. Sensitising on-the-ground partners and logistics and finance teams in the organisation to the plan will help to overcome major challenges at later stages and will help them to understand the importance of the activity and its impact: success depends on inter-organisation coordination.

Capacity-building and supportive supervision

In the field, a team of technical supervisors must be prepared and empowered to take decisions on operational matters and to tackle technical issues in the field during data collection. The objective of these assessments is to collect high-quality data. This will require investment in quality training of enumerators and team leaders, coupled with a standardisation test and a practical field test, close and supportive supervision from the team leaders/supervisors, daily meetings before field work to discuss quality and address field challenges, daily data entry and regular plausibility checks.

Involving village leaders and representatives during data collection for extended support and training the data collectors in behavioural change will build a positive image of the organisation in the community.

Data analysis and report writing

A multi-dimensional perspective is needed during data analysis as nutrition is a multi-sector discipline requiring multiple, co-related indicators. Once the data analysis is complete it is essential to present it to the multi-sector stakeholders for the preliminary results to be validated before drafting the final report.

Achievements to date

From 2015 to January 2019, the team conducted 52 surveys, including 36 SMART surveys (19 in IMC operational areas and 17 in non-IMC op-

erational areas).⁴ In addition, IMC has provided technical support to partners with limited nutrition-survey capacity (specially SMART-survey capacity). IMC has also improved the in-house capacity of government and NGO personnel to conduct SMART surveys and other relevant nutrition assessments. In total, since 2015, IMC has trained 1,182 individuals from different partners, including national and international NGOs, County Health Departments (CHD), state MoHs and national MoH. The information collected in these surveys has been used for IPC analysis, advocacy and to inform programme interventions.

In-country support has also been provided to other IMC missions. For example, support was given to the Somalia mission to strengthen staff capacity to conduct a SMART survey. This also built the capacity of national South Sudan staff by giving them international experience.

Next steps

IMC is keen to continue the success of the NASS team and aims to expand its reach, capacity and impact by taking the following actions, according to the IMC Nutrition Strategy 2019-2021:

- Advocacy to establish inter-sector (nutrition; health; gender-based violence; and water, sanitation and hygiene (WASH)) assessment tools to integrate multi-sector indicators within surveys.
- Further build the capacity of IMC staff to develop data collection tools, digitalise data and use data-analysis software.
- Continue to utilise the South Sudan surveillance team to support other IMC country missions to establish similar mechanisms.
- Mobilise funds to establish a centralised, online nutrition-surveillance data hub at IMC Juba office with open access to all relevant stakeholders, including the Nutrition Cluster and NIWG
- Incorporate nutrition-surveillance team costs into existing and upcoming grants to build system sustainability.
- Strengthen the liaison with the Nutrition Cluster and NIWG to support countrywide surveys, such as the FSNMS, IRNA and RRM, among others.
- Continue providing vital inputs to IPC analysis as a potential partner of the Relief Organization for South Sudan (ROSS), the Government and the UN Food and Agriculture Organization.
- At the request of the Nutrition Cluster, introduce a cost-recovery mechanism for surveys conducted in areas IMC non-operational areas to improve sustainability and enhance partner ownership and thereby enhance cooperation and improve outcomes.

For more information, please contact Muhammad Ali Jatoi at mjatoi@internationalmedicalcorps.org

³ DHIS2 is the flexible, web-based open-source information system www.hisp.org/services/dhis-2/

⁴ Three SQUEAC assessments; four IYCF assessments; one barrier analysis; two community assessments; three health and nutrition KAP, two IRNA and two RRM surveys in areas where the organisation is currently not operating.

Special focus on GTAM

Global Technical Mechanism for Nutrition (GTAM)

The Global Technical Assistance Mechanism for Nutrition (GTAM) is a soon-to-be launched common global mechanism, endorsed by over 40 Global Nutrition Cluster (GNC) partners. It is being established to provide nutrition technical assistance to support quality programming for people affected by humanitarian emergencies. The story of how the GTAM has evolved is described in detail in the first article in this special section.

What is the status of GTAM now? GTAM remains in the 'build' stage. Progress has been hampered somewhat by delays in launching the online platform. This is currently being resolved ready for online launch in 2020. In the meantime, the focus during 2019 has been to agree and document ways of working through standard operating procedures and principles of engagement with Global Technical Working Groups (GTWGs) on key topic areas. These groups are in various stages of development: those that have been integrated into existing forums (such as the Infant Feeding in Emergencies Core Group¹) have naturally progressed faster, while others are in early-establishment phase. A baseline technical needs assessment has also been carried out, including a review of technical discussions posted on en-net

(ENN's online technical forum; www.en-net.org). Findings are summarised in articles in this section and provide insight into the technical gaps that will be prioritised in the workplans of each GTWG.

Work was also undertaken in 2019 to define ways of working with existing mechanisms, such as the GNC Technical Helpdesk, United Nations Children's Fund (UNICEF) HQ, en-net and the Technical Rapid Response Team (Tech RRT). The continued commitment of the GTAM Core Team (UNICEF, World Vision, ENN) to work with others, use existing platforms and gain broad ownership has meant that the journey to this point has taken time. However, we hope that this will serve GTAM well in the long term by providing a stronger mechanism that will provide systematic, predictable, timely and coordinated nutrition technical assistance, true to its aim.

This special section is the fulfilment of part of ENN's commitment to provide knowledge-management expertise to the GTAM.² Here, we document the journey so far – why the GTAM is coming into being, what technical priorities it will address, and how. We will continue to update you periodically as the story evolves.

¹ www.enonline.net/ifecoregroup

² Information shared here has drawn on the Global Technical Mechanism for Nutrition (GTAM): Quarterly Digest, April to July 2019, compiled by ENN. Quarterly Digests will be available on the GTAM platform once launched.

By Isabelle Modigell and Tanya Khara



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background and over six years of experience working in a variety of humanitarian settings during all stages of emergency response.



Tanya Khara is a Technical Director at ENN. She is a public health nutritionist with 20 years' experience in humanitarian and development programmes, policy and research. Tanya is the lead for ENN's role as knowledge management partner for the GTAM.

The authors would like to sincerely thank and acknowledge those who were interviewed for the purposes of this article, including Josephine Ippe (Global Nutrition Cluster (GNC) and former GNC Nutrition in Emergencies (NiE) Technical Task Force members Leisel Talley (Centers for Disease Control and Prevention), Erin Boyd (United States Office for Disaster Assistance), Carmel Dolan (ENN), Megan Gayford (Save the Children), Colleen Emary (World Vision International), Ruth Situma (United Nations Children's Fund (UNICEF)), Zita Weise Prinzo (World Health Organization) and Britta Schumacher (World Food Programme). Additional thanks to Colleen Emary, Diane Holland (UNICEF) and Andi Kendle (Technical Rapid Response Team) for reviewing this article.

This article shares the findings of several studies and reports (referenced herein) and is framed around interviews conducted by ENN to capture learning to date on the process of developing the GTAM. The views expressed here are those of the authors themselves and do not necessarily represent the views of UNICEF or other organisations.

Global Technical Assistance Mechanism for Nutrition (GTAM): The story so far

Location: *Global*

What we know: There is a longstanding demand for predictable, accessible technical assistance on nutrition in emergencies (NiE) for country practitioners.

What this article adds: The Global Technical Assistance Mechanism for Nutrition (GTAM) is a global mechanism endorsed by over 40 Global Nutrition Cluster (GNC) partners which is being built to facilitate provision of timely, predictable NiE technical assistance at country level. The GTAM core team (GTAM-CT) comprises UNICEF (lead), World Vision International (co-lead), the Technical Rapid Response Team (Tech RRT), the GNC Coordination Team, GNC Technical Helpdesk and ENN (knowledge management). Leveraging what already exists wherever possible, efforts centre around three 'pillars' to fill identified gaps: (1) provision of technical advice to support implementation of normative guidance (in collaboration with ENN's online platform en-net); (2) development of consensus-driven interim guidance where there is none (through existing or new Global Thematic Working Groups (GTWGs) and the World Health Organization); (3) provision of specialised technical expertise to countries (in collaboration with the existing Tech RRT). Numerous processes and discussions have influenced the conceptualisation and setting up of the mechanism over several years, enabling broad participation and ownership by the GNC collective. Current priorities are finalising practical details for implementation phase, developing a strategy to sustain the initiative, and formalising links and ways of working with existing bodies.

The Global Technical Assistance Mechanism for Nutrition (GTAM) is a common global mechanism endorsed by over 40 Global Nutrition Cluster (GNC)¹ partners to provide systematic, predictable, timely and coordinated nutrition technical assistance in order to meet the nutrition rights and needs of people affected by emergencies. As the GTAM's build launched this year, we take a look in this article at how and why it came to be, with the help of some of the people who have been involved in the journey so far.

Origins of the GTAM

The conception of the GTAM can be pinpointed to the GNC annual meeting in 2015. Discussions at this meeting highlighted issues around operational 'grey zones' (technical areas of nutrition in emergencies (NiE) for which there is no normative guidance) and limitations in technical operational capacity, which at the time arose in emergencies in the Philippines, Ukraine and Syria. Consequently, a decision was taken to reassess and more clearly define the GNC's technical role. Space previously existed at the global level to identify and grapple with technical issues in the form of the NiE working group of the United Nations Standing Committee on Nutrition

(UNSCN). However, this group ceased in 2008 and, although the GNC became operational around the same time, there was a lack of clarity on the GNC's technical role compared to its clear mandate with respect to coordination and information management. In its early years, the GNC provided some technical support, in particular through technically-oriented working groups, and actively advocated for the re-establishment of a technical space, although unsuccessfully. However, a governance review in 2013 recommended that the GNC turn its focus firmly towards its core functions of coordination and information management (Gostelow, 2013). Josephine Ippe, former GNC Coordinator, stated in interview,

"I knew even then that when the governance review talked about the GNC, it was referring to the Coordination Team (GNC-CT), not the collective. You can't talk about the collective not having a technical role; it's impossible when what you are implementing is technical."

Unsurprisingly therefore, just two years later, it was widely agreed that, while the provision of technical support was outside the scope and capacity of the GNC-CT, the GNC as a community

does have a role in the provision of technical support, and that a collective agreement was needed on exactly what that role should be. Two papers (Le Cuziat and Frize, 2015; Richardson and Ververs, 2015) were subsequently commissioned by the GNC-CT to evaluate the support provided by the GNC to national coordination platforms, the GNC's collective role in providing technical support and how best this role could be supported. Specific gaps were highlighted by both papers; one of which concluded that:

"The NiE sector is missing an overarching technical platform which can provide strategic direction on how to prioritise and address technical capacity gaps at country level." (Le Cuziat and Frize, 2015).

Specific gaps identified by the papers and subsequent discussions with GNC partners related to insufficient on-the-ground expertise to translate existing guidance into practice; a lack of predictable processes to address technical areas where no normative guidance exists; and an absence of leadership and coordination for the provision of NiE technical expertise to countries.

¹ The Global Nutrition Cluster (GNC) is a partnership of international non-governmental organisations (NGOs), the Red Cross and Red Crescent Movement, United Nations (UN) organisations, and donors and individuals

GNC members recognised that, in today's rapidly changing humanitarian environment, responders are increasingly facing emerging issues for which there is no normative guidance, or for which existing guidance must be adapted to a new context. The growing complexity of emergencies means that clarity and coherence is essential. Britta Schumacher, World Food Programme (WFP) and former Task Force member, stated:

"It's the exceptional circumstances that generate lots of questions; they are the instances where practitioners get stuck, when there is no evidence or experience available, and guidance is needed."

The frustrations felt by practitioners on the ground who "needed guidance yesterday" had often been shared in GNC meetings and calls. For example, the 2014 Ebola virus disease (EVD) outbreak required clarity on the nutritional care of EVD-infected patients² and on breastfeeding in the context of EVD,³ highlighted on Emergency Nutrition Network (ENN)'s en-net forum. Although, in this high-profile instance, willing partners (World Health Organization (WHO), ENN, UNICEF and others) quickly came together to produce rapid interim (and subsequent WHO normative) guidance, a systematic mechanism was lacking that could track and tackle emerging and unresolved technical issues. GNC partners felt that an overarching mechanism could remove the need for the (often slow) process of forming new structures to tackle each emerging challenge and increase confidence in outputs developed through a clear, transparent and predictable process.

Partners also recognised the existence of longstanding, unresolved issues discussed by the international community for many years (the weight-for-height versus mid-upper arm circumference (MUAC) debate is an oft-quoted

example). It was felt that a global mechanism could bring together practitioners, donors, academics and other key stakeholders to arrive at consensus-driven conclusions on such issues with an accepted level of legitimacy. Stakeholders also noted the need for support in the dissemination and communication of new guidance. Britta Schumacher shared her previous experience of developing guidance on community-based management of acute malnutrition (CMAM) programming in exceptional circumstances:

"We were a bit uncertain as to how we would disseminate it, who would accept it, how to communicate it and how to have it validated. The GTAM could have developed and communicated such interim guidance and led the dialogue on how to go about it."

Another issue identified was that guidance documents and technical materials are currently scattered across various partners, without easy common access. This has resulted in duplication of guidance, inefficiencies (time and resources), limited reach, a lack of technical coherence and, ultimately, impact. A former Task Force member explained, "We have all lost so much time looking for the right tool or rewriting things." A common and accessible repository for guidance and technical material with a knowledge-management mechanism to highlight inconsistencies and signpost people to the different resources available was another gap identified that it was felt an overarching platform could address.

By 2015, the ad hoc nature of initiatives providing technical support resulted in disconnected resources, unclear processes, duplications of effort, over-reliance on personal networks (rather than having access to the expert best suited to the job at hand) and (the bottom line) an inadequate response to country needs. "There were several ini-

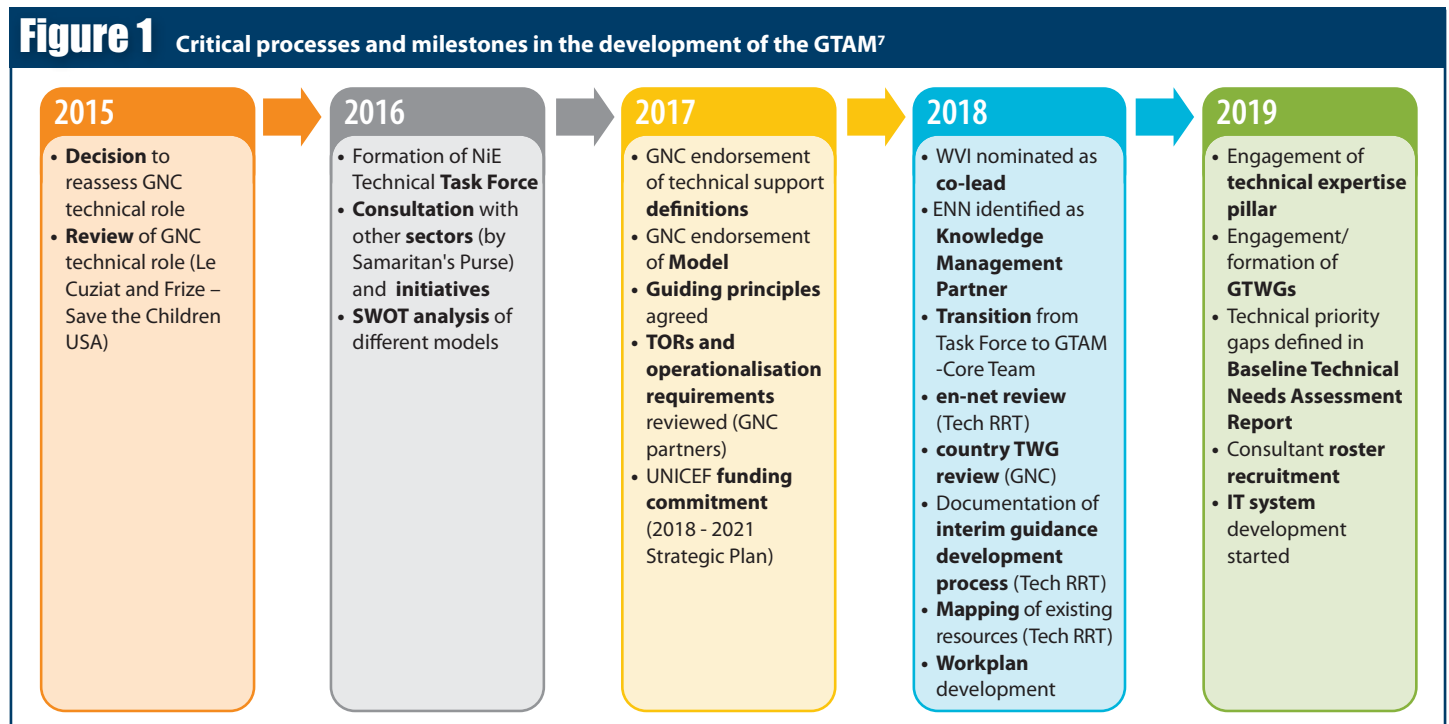
tiatives doing really good work, but we knew that if there was something to bring them together, we could be more effective," said Colleen Emary.⁴

In response to the need for technical expertise, the Technical Rapid Response Team (Tech RRT) was established by a consortium of GNC partners in 2015. This aimed to improve the overall availability of NiE specialists during large-scale emergencies by deploying centrally recruited, skilled technical advisers in response to country-level requests. By June 2019, the Tech RRT had provided technical surge capacity through 50 deployments in response to 61 requests.⁵ The uptake of the Tech RRT highlights the demand for specialist technical expertise at field level. The actual need is likely under-represented in these figures, given the limited awareness of the service by actors on the ground, its focus on a small number of technical areas, and the limited capacity of the small, busy Tech RRT team.

Development of the GTAM

The recommendations made by the 2015 papers fuelled the GNC NiE Technical Task Force,⁶ chaired by the UNICEF and the Centers for Disease Con-

² www.en-net.org/question/1460.aspx
³ www.en-net.org/question/1445.aspx
⁴ Former Task Force Member and current GTAM-CT Member, World Vision International.
⁵ Read a collection of field articles on the experiences of the Tech-RRT in *Field Exchange* 56 special issue on Global Nutrition Cluster coordination. Download from: www.enonline.net/fex/56/en
⁶ The Task Force was co-chaired by UNICEF (Diane Holland and subsequently Ruth Situma) and the CDC (Leisel Talley.) Members included the GNC (Josephine Ippe), World Vision (Colleen Emary), ACF (Jose Luis Alvarez, Anne Dominique Israel and Danka Pantchova), Tech RRT / IMC (Geraldine Le Cuziat), UNHCR (Caroline Wilkinson), Save the Children (Nicki Connell and Megan Gayford), HelpAge (Juma Khudonazarov), Samaritans Purse (Julie Tanaka) and OFDA (Erin Boyd).
⁷ 2019 Needs Assessment Report: www.enonline.net/resource/baselinetechnicalneeds2019



Control and Prevention (CDC), tasked with identifying ways that GNC partners could organise themselves to address technical operational gaps. From 2015 to 2018, the Task Force led on a series of processes that culminated in the birth of the GTAM (Figure 1).

A fundamental first step for the Task Force was to outline the problem it had been created to address. Definitions of technical roles were consequently outlined and endorsed by partners in 2017. An analysis of models (based on a review of other clusters' experiences) was undertaken and one subsequently endorsed by the GNC. It was eventually agreed that the scope of work for the technical mechanism would be to provide technical advice, consensus-driven guidance and specialised technical expertise, now referred to as the "three pillars of the GTAM" (Figure 2). This informed the subsequent operationalisation of the mechanism, including decisions about who should be involved.

Several critical conversations influenced the conceptualisation of the GTAM. Discussions took place on governance and leadership of the mechanism, particularly around the need to strike the right balance between providing leadership and maintaining a collaborative spirit to capitalise on the GNC's collective and widespread expertise. In 2018, responsibility for further developing the mechanism transitioned to a wider GTAM Core Team (GTAM-CT).⁸ In response to partners' concerns that the process felt too 'United Nations (UN)-centric' at times and based on past positive experiences of shared leadership models, the decision was made for a nominated non-governmental organisation (NGO) to co-lead the GTAM alongside the nominated UN agency. Following a review of nominations against set criteria by the

GNC Strategic Advisory Group (SAG), World Vision International (WVI) was selected as the NGO co-lead for a two-year term. UNICEF was nominated to continue as the UN co-lead in line with its accountabilities as Cluster Lead Agency.⁹ In response to a call from partners to engage existing service providers, ENN was brought into the GTAM-CT to oversee knowledge management and monitoring of the mechanism. The Tech-RRT, as an existing provider of technical expertise and en-net, ENN's online platform for technical support (www.en-net.org), were embedded within the GTAM. Given the demonstrated achievements of the Tech RRT,¹⁰ a desire existed to build on its experience of supplying technical expertise, whilst overcoming some of its previous capacity limitations. By uniting many more GNC partners under a common approach, it is anticipated that country needs will be matched with available capacity more effectively. Zita Weise-Prinzo, WHO and former Task Force member stated:

"The important thing was to involve existing initiatives from the beginning and see how their added value could be pulled into this work. I think that was done in a good way."

Global Thematic Working Groups (GTWGs) were (or are in the process of being) established, using existing multi-agency groups where possible (such as the Infant Feeding in Emergencies (IFE) Core Group¹¹), to bring together expert stakeholders in specific areas to answer technical questions and provide consensus-driven responses where guidance is insufficient or unclear (interim guidance). It is anticipated that this approach will enable a transparent and consultative process, resulting in high-quality and unbiased technical support that carries sufficient weight and is responsive to the needs of the

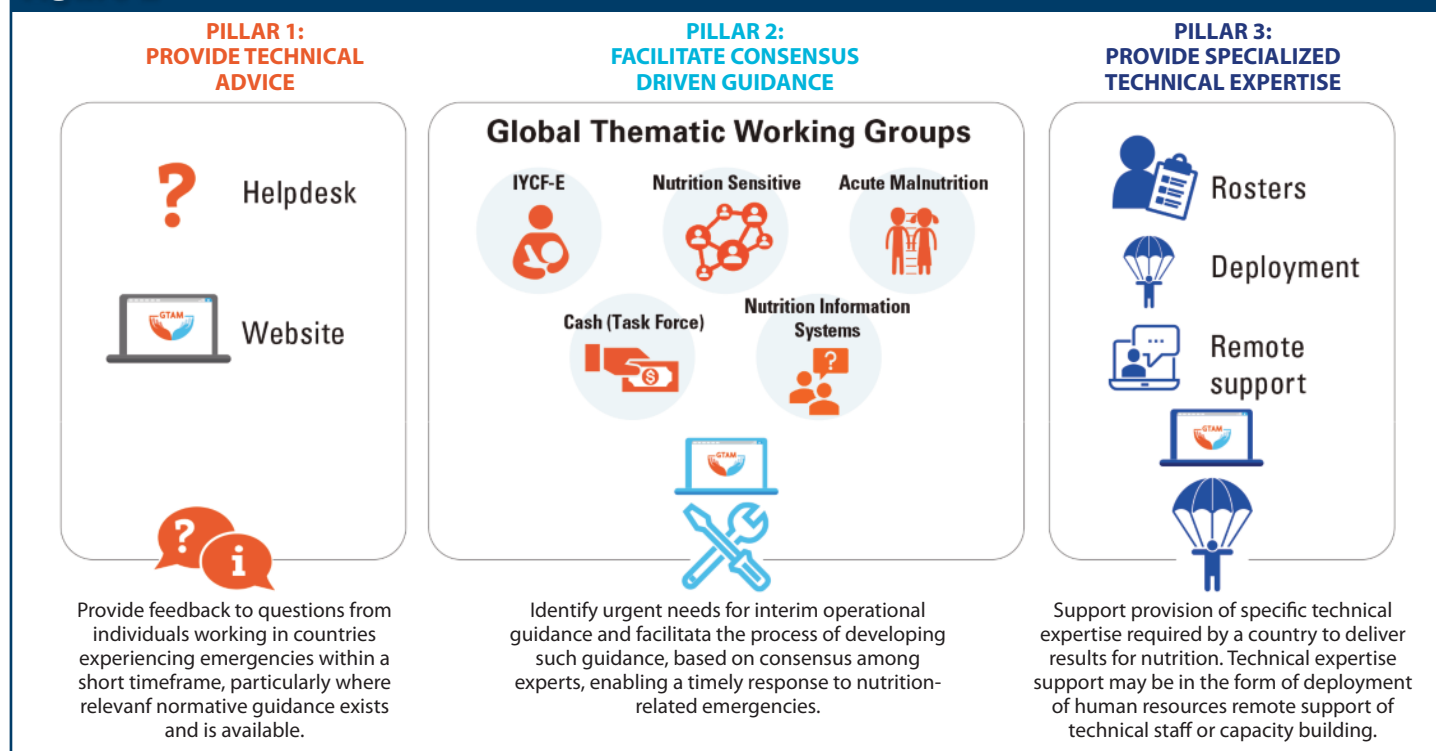
sector as a whole, rather than individual agency priorities. As the GTAM is not, however, a normative agency, it was recognised that, where new recommendations are required (rather than guidance on implementation or adaptation), a more formal WHO interim or comprehensive guidance process may be needed. A 'triage protocol' was therefore developed to help decide where gap issues are best addressed (GTAM or WHO), for trial on a case-by-case basis. Zita Wise-Prinzo from WHO stated:

"Although questions remain, it is more important to get this process going and learn by doing to improve the mechanism."

Care has been taken to ensure that the GTAM and GTWGs do not duplicate existing global-level structures and that GTAM activity does not undermine or encroach on country and regional-level capacities and responsibilities. This has been achieved through engagement with existing expert groups, the development of a clear terms of reference (TOR) for the GTAM and its GTWGs, and identification of appropriate contact points for GTAM users (en-net, UNICEF HQ, the GNC technical helpdesk, Tech-RRT and WVI) to enable a good flow of information and avoid gatekeeping. Zita Wise Prinzo stated:

⁸ The GTAM Core Team is co-led by UNICEF (Ruth Situma) and World Vision (Juliane Gross and Colleen Emary). Members include the GNC Coordination Team (Josephine Ippe and Anna Ziolkovska), the GNC Technical Helpdesk (Yara Sfeir), the Tech RRT (Andi Kandle) and ENN (Tanya Khara and Isabelle Modigell).
⁹ UNICEF (2014) Evaluation of UNICEF's Cluster Lead Agency Role in Humanitarian Action (CLARE).
¹⁰ Allen, B. (2018) External Evaluation of the Technical Rapid Response Team. Tech RRT and USAID and *Field Exchange* issue 56 on Nutrition Cluster Coordination pages 62-75.
¹¹ Infant Feeding in Emergencies (IFE) Core Group www.enonline.net/ifecoregroup

Figure 2 The three pillars of the GTAM



Box 1 GTAM guiding principles

- Maximising existing technical resources at country, regional and global level and avoid duplication of efforts.
- Serving both the nutrition sector as a whole as well as individual agencies, with the best interest of the affected population at the heart of work, regardless of agency motivations.
- Tackling technical issues in a timely, coordinated and collaborative way to enable quality and effective nutrition response in humanitarian crisis.
- Facilitating consensus on Nutrition in Emergencies (NiE) related guidance/best practices and enable global networks supporting countries to speak with 'one voice' to avoid confusion of practitioners.
- Addressing nutrition technical gaps that are most important and most feasible for the GTAM to impact.
- Acting to facilitate, coordinate and catalyse filling of technical guidance gaps, but not to execute the development of guidance itself.
- Ensuring official guidance is evidence-based, and all other guidance (e.g. interim) may be based on best practice and experience.

"I think this is the first time that there is an attempt to formalise the process and look at it in a more holistic way; not only technical gaps, but also how to give technical assistance. It's more practical, more strategic and more systematic."

Strengths and challenges of the process

Work has also gone on behind the scenes to generate buy-in among GNC partners and beyond. Interviewees identified UNICEF's tangible demonstration of its commitment through dedicated both staff time and funding as well as the participative and inclusive process as key enabling factors for buy-in; cluster partners have been included in discussions at every stage and concerns, needs and feedback have been actively sought and listened to. Other feedback, however, suggests that stakeholder mapping was a missed step in the process, which limited the composition of the Task Force to individuals who attended the 2015 GNC meeting. Due to its voluntary nature, it was also felt that the Task Force was biased towards those who had sufficient role flexibility and interest. Megan Gayford, Save the Children and former Task Force member, stated:

"If the process had optimal resourcing from the outset, a cost-recovery basis for task force members' time – where their organisations required this – may have facilitated a more holistic and diverse representation."

An initial lack of clarity on the scope of the end product and the large amount of preparatory work required prior to the mechanism's launch also made it difficult to manage expectations and maintain confidence in what often appeared to be a slow process. Ruth Situma, former Task Force member and GTAM co-lead until 2019, said:

"Because you're building as you go, there is uncertainty. How will it work? How will it affect me, my institution, my donors, our operations? Some want certainty before buying in."

Understanding needs and concerns, obtaining inputs from those working in emergencies, building trust and buy-in and the collective conceptualisation of an entity of this magnitude all require time. Nevertheless, the process may well have been slowed down by a lack of dedicated resources for several years. The allocation of funding (which resulted from the inclusion of

GTAM in UNICEF's 2018-2021 Strategic Plan) and UNICEF staff time to lead the GTAM's development were identified in interviews as critical accelerators to the GTAM's progress from 2018 onwards. However, others interviewed regarded the long period of time taken for the commitment of this funding as a constraint that further slowed the process and questioned the value of attempting to move forward before base resources were secured – resources that could have included staff time from a broader range of agencies. An over-reliance on infrequent GNC meetings to advance discussions and build consensus was identified as another barrier, with the changing composition of participants over the years requiring previous decisions and discussions to be revisited.

Despite these challenges, presentations at the 2019 GNC Annual Meeting revealed the significant progress that has been made. Although many identify Ruth Situma as the driving force behind this progress, she acknowledges that much of where the GTAM is today is thanks to inputs by country coordination teams and technical partners over the course of six GNC meetings. As she stated;

"We have come this far because of the support of different stakeholders at country, regional and global levels."

Current priorities

The GTAM now finds itself in the critical phase of working out the practical details of the mechanism and moving into the phase of implementation, getting it fully up and running in line with GTAM guiding principles, as collectively conceptualised and endorsed by the GNC Collective (See Box 1). A strategy to ensure the GTAM's sustainability, both in terms of agency commitments and financial resources, is being defined. This includes the development of a common resource mobilisation strategy to secure core funding for multiple agencies and allow cost recovery for others, based on the learning of the past years. Efforts continue to strengthen connections with existing GTWGs outside the GTAM and formal linkages with key UN agencies. Nicolas Joannic of WFP stated in interview;

"I see that WFP would have a great role to play in the GTWGs on CMAM, IFE, assessments and nutrition-sensitive programming."

Looking forward

We asked interviewees what the big picture is that is being worked towards. Erin Boyd, United States Office for Disaster Assistance (OFDA) and former Task Force member, explained:

"The GTAM is a platform through which people can access different types of technical capacity, whether it's guidelines, policies, understanding recent evidence, or actual hands-on support that's needed."

Leisel Talley of CDC and a former Task Force member added:

"It's a consortium of partners that can provide various forms of assistance to other partners or entities, a consolidated place to request assistance and address broader technical issues."

Ruth Situma described the GTAM as:

"A public good that is available to respond to the needs of countries."

The GTAM's visionaries are also keen to emphasise that the GTAM aims to serve. Megan Gayford stated:

"It's a global service mechanism. We have a clear problem in the complexity of the system in which we work, so the GTAM should be looking to solve that problem by making what's needed accessible and that process efficient."

Colleen Emary added:

"It's a mechanism that is going to be responsive to the user... we are working under the ethos that we are service providers and those requesting services are clients."

And the bottom line? Erin Boyd said:

"I see it very much as a platform that will have an actionable role in helping agencies to better programme NiE. Just as it has become easier for Nutrition Cluster Coordinators to contact the GNC Helpdesk and figure out what they're able to do, I hope it will become easier for practitioners too."

Colleen Emary concluded that the GTAM *"has the potential to bring together the emergency-response community and improve the way we're working."*

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Read a one-page brief on GTAM at <https://www.enonline.net/resource/gtamfor-nutrition>

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Baseline technical needs assessment for the Global Technical Assistance Mechanism for Nutrition (GTAM)

Summary of review¹

Location: *Global*

What we know: A common Global Technical Assistance Mechanism (GTAM) has been developed to address technical gaps in nutrition in emergencies (NiE).

What this article adds: A baseline needs assessment was carried out between 2018 and 2019 to identify priority thematic areas, and technical gaps within them, to inform the GTAM workplan. Methods included a review of posts on en-net (ENN's online technical forum); surveys of Nutrition Cluster Coordinators and Country Technical Working Group members; and key informant interviews. Findings were reviewed and synthesised at the 2019 Global Nutrition Cluster (GNC) annual meeting and by a GNC partner survey. Key technical priorities were identified in the following priority areas: nutrition assessment; community-based management of acute malnutrition (CMAM); and infant and young child feeding in emergencies. The GTAM coordination team will work with Global Thematic Working Groups (GTWGs) under GTAM to identify appropriate actions in response to each technical priority. These actions will form the basis of the initial workplan and direction of the GTAM and GTWGs, which will be reviewed regularly in response to emerging needs.

In 2016, the Global Nutrition Cluster (GNC) initiated a technical task force to propose a mechanism for addressing technical gaps in nutrition programming in humanitarian contexts. The concept of the Global Technical Assistance Mechanism for Nutrition (GTAM) was developed and endorsed during the 2017 GNC annual meeting and subsequently developed.² The three main functions of the GTAM are to: 1) provide technical advice; 2) facilitate consensus-driven guidance; and 3) provide specialised

technical expertise. To design an effective service responsive to country-level needs and inform the GTAM workplan, a baseline technical needs assessment explored the key technical gaps where advice is sought by nutrition-in-emergencies (NiE) practitioners and priorities by thematic area.

Mixed methods were used between 2018 and 2019, including a review of posts on en-net (ENN's online technical forum, www.en-net.org);³ a survey of Nutrition Cluster Coordinators (n=5);

an online survey of GNC Country Technical Working Group (CTWG) members (n=33); and key informant interviews (n=22). Results were collated and shared at the 2019 GNC annual meeting, where working groups reviewed findings and identified technical priorities and next steps. Priorities were further refined by a GNC partner survey in 2019 to determine final technical priority areas.

Findings reveal that the three priority technical areas are: assessment; community-based management of acute malnutrition (CMAM); and infant and young child feeding in emergencies (IYCF-E). Within these areas, the key technical priorities identified are summarised in Box 1.

These will inform the initial workplan and direction for the GTAM and the Global Thematic Working Groups (GTWGs) under GTAM. A system to ensure ongoing monitoring of issues and questions coming into the GTAM mechanism will be put in place to ensure that GTAM is agile enough to respond to any changing and emerging needs not reflected in the baseline.

Planned next steps are to share the identified technical priority gaps with relevant GTWGs to examine identify best way forward⁴, obtain feedback from Nutrition Cluster Coordinators on whether the suggestions will provide practical solutions to the country-level technical needs; and identify who is best placed to take actions forward. More straightforward actions will likely be addressed by the GTAM Coordination Team (GTAM-CT), while more complex issues, where current guidance is unclear or non-existent, will be carried out by specialised GTWGs and their networks (for example; within academia). It is recommended that agreed actions are included in costed GTWG workplans.

Moving forward, channelling technical questions that cannot be answered at country level into a central entry point for technical support (i.e. the GTAM) offers the opportunity for the regular and systematic analysis of challenges faced by a broad range of NiE practitioners.

For more information, please contact Isabelle Modigell at GTAM@enonline.net

Box 1 Technical NiE priorities identified in the GTAM baseline needs assessment

Assessment:

- Influence of body shape on anthropometric status;
- How to undertake sampling in pastoral areas;
- Estimating dietary intake among households eating from a common plate;
- Estimating feeding practices in children older than two years.

CMAM:

- Alternative moderate acute malnutrition (MAM) management;
- Clear guidelines on what to do in the absence of a therapeutic product;
- Clarity/guidance on simplified protocols/combined protocols/expanded criteria using ready-to-use therapeutic food (RUTF)/ready-to-use supplementary food (RUSF) for the management of severe acute malnutrition (SAM) and MAM;
- Better integration of SAM screening for infants under six months of age for community volunteers;
- How to best calculate the SAM and MAM caseload? (What is the correct incidence correlation factor to be used?)

IYCF-E:

- Clear guidance on monitoring and evaluation for IYCF-E;
- Strong global guidance on the management of non-breastfed infants in emergencies using ready-to-use infant formula (RUIF);
- Impact of cash-based programmes on IYCF practices;
- Direct impact of IYCF programmes on stunting and wasting;
- Review of current guidance on IYCF Corners and mother-and-baby areas (MBAs) to streamline and widely disseminate.

¹ GTAM (2019) Baseline technical needs assessment. Available from: www.enonline.net/resource/baselinetechnicalneeds2019

² See article in this issue of *Field Exchange* 'Global Technical Assistance Mechanism for Nutrition (GTAM): The story so far'.

³ Results of the en-net review are shared in the accompanying article in this issue of *Field Exchange*, 'A review of technical discussion on en-net: Recurring questions and gaps experienced by programmers'.

⁴ A process that has already been undertaken with the Infant Feeding in Emergencies Core Group for the priorities highlighted under IYCF-E.



A review of technical discussion on en-net: Recurring questions and gaps experienced by programmers

By Scott Logue, Michele Goergen, Isabelle Modigell, Andi Kendle, Tamsin Walters and Marie McGrath



Scott Logue has been Assessment Adviser to the Technical Rapid Response Team (Tech RRT) since 2015. He has been deployed to

multiple humanitarian contexts to support Nutrition Clusters/ Sectors and Assessment Working Groups and has provided remote support on nutrition assessment to individual organisations and coordination mechanisms.



Michele Goergen holds an MSc in Clinical Nutrition from New York University and is a registered dietitian. She has over eight years' experience working on nutrition

programmes. Michele previously served as the Tech RRT Adviser for community-based management of acute malnutrition and infant feeding in emergencies.



Isabelle Modigell is a consultant with a background in public health and over six years' experience in a variety of humanitarian settings during all stages of

emergency response. She is currently Emergency Nutrition Network (ENN) Project Manager for knowledge management of the Global Technical Assistance Mechanism (GTAM).



Andi Kendle has been the Programme Director of the Tech RRT since September 2016. She has over 15 years of experience in humanitarian assistance and

development contexts, working in nutrition, food security and livelihoods, and child protection.



Tamsin Walters has been ENN's en-net moderator since en-net was launched in 2009.



Marie McGrath is a Technical Director at ENN and oversees the en-net platform.

The authors acknowledge the contributions and support of Ruth Situma of the United Nations Children's Fund (UNICEF) and Tanya Khara, ENN Technical Director (GTAM knowledge management lead) in this review.

Location: *Global*

What we know: There is demand for timely and systematic nutrition technical support to countries during emergencies. en-net is an online technical moderated platform established in 2009 to help address this.

What this article adds: A Global Technical Assistance Mechanism for Nutrition (GTAM) will be launched in 2019 to meet country-level technical needs; where possible leveraging technical support that already exists. A review of issues discussed on four en-net thematic areas (infant and young child feeding interventions; prevention and treatment of severe acute malnutrition; prevention and treatment of moderate acute malnutrition (MAM); and assessment and surveillance¹) was synthesised and analysed for themes and gaps to inform GTAM priorities and ways of working. The most popular thematic area was assessment and surveillance; the least activity was seen on MAM. A broad range of challenges was identified for each forum area that may reflect evidence or guidance gaps or poor awareness, application and accessibility of what is available. en-net technical discourse is a rich, ongoing resource for the GTAM. Recommendations support the planned integration of en-net within the mechanism and advise future en-net/GTAM collaboration to better address unresolved technical questions and technical discord, strengthen knowledge management, and increase country-level engagement in responses.

Background

For the past few years, Global Nutrition Cluster (GNC) partners have sought to identify a solution to the gap in provision of timely and systematic nutrition technical support to countries during emergencies. A GNC Task Force was formed in 2016 to address this and, following extensive consultation, the concept of the Global Technical Assistance Mechanism for Nutrition (GTAM) emerged. This was subsequently endorsed in a GNC meeting in 2017 and will be launched in 2019. The GTAM's main functions are to provide technical advice, facilitate consensus-driven guidance, and improve access to technical expertise to address unresolved technical issues once country and regional capacities are exhausted. It will seek to leverage existing technical support mechanisms wherever possible.

To take stock of issues commonly faced by practitioners working in emergencies and so inform GTAM priority technical areas, a review of the four most commonly used technical forums on the Emergency Nutrition Network (ENN)-hosted online technical forum, en-net², was undertaken by the Technical Rapid Response Team (Tech RRT³) between June and October 2018, overseen by ENN and UNICEF. This is one of several reviews conducted by the GTAM in preparation for its launch (GTAM, 2019). This article provides an overview of the findings of this review.

Objectives and methodology

The aim of the review was to synthesise discussion on en-net to identify key learning and gaps in guidance and evidence/research, as viewed by programmers. Specific objectives addressed were to:

1. Review and classify content of the en-net thematic categories by technical theme;
2. Analyse the content of en-net forum exchanges, pulling together discussions which complement each other, address a common theme and which may build a body of experience around a topic;
3. Determine the degree to which technical questions have been addressed.

Four thematic areas were reviewed: infant and young child feeding (IYCF) interventions; prevention and treatment of moderate acute malnutrition (MAM); prevention and treatment of severe acute malnutrition (SAM); and assessment and surveillance. Questions posted from 2009 onwards were exported into Excel, categorised by sub-theme and type of post, and analysed in terms of the number of replies, whether a definitive answer was provided (classified as 'fully' or 'partially' answered) and whether there was consensus or disagreement. As the review spans almost nine years, apparent gaps in earlier posts may have been resolved since the question was posted. The approach to data analysis was adapted per theme due to the varying nature of questions and responses by forum. Forum areas were reviewed according to the Tech RRT's desk-based (non-deployment) availability.

¹ The 'assessment' thematic area on en-net has since been renamed 'assessment and surveillance'

² www.en-net.org and www.fr.en-net.org

³ The Tech RRT is an emergency response mechanism formed in 2015, led by International Medical Corps in a consortium with Save the Children and Action Against Hunger, that aims to improve the quality and scale of nutrition humanitarian responses. It is funded by USAID/OFDA, Irish Aid and SIDA and works in close collaboration with the GNC and UNICEF Program Division and is part of the GTAM.

Figure 1 Percentage of questions posted 2010-2018 by thematic area reviewed

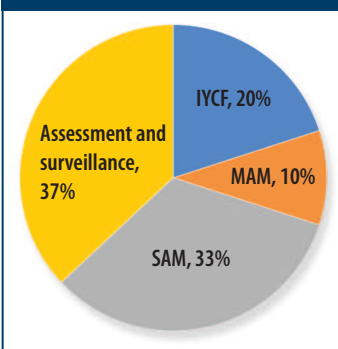
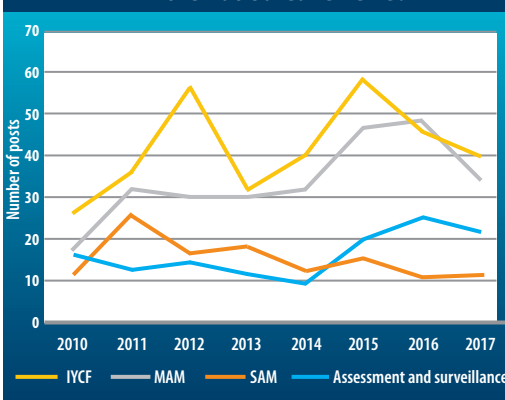


Figure 2 Number of new questions over time posted 2010-2018 by thematic area reviewed



Findings

A total of 984 questions were analysed that generated 3,939 replies and 2,570,220 views between 2009 and 2018. Overall activity by theme is summarised in Table 1. 'Assessment and surveillance' was the most commonly used forum (40% posts, 2009 -2018, 42 posts/year), followed by the 'prevention and treatment of SAM' forum (37% of posts, 34/year); see Figure 1. As shown in Figure 2, questions related to assessment and surveillance rose over time (from 26 in 2010 to 40 in 2017), with peaks in 2012 (57) and 2015 (59). The 2012 peak involved numerous questions related to mid-upper arm circumference (MUAC) that coincided with the 2012 launch of the SMART website.⁴ Questions related to SAM rose from 17 in 2010 to 35 in 2017. Questions on MAM peaked at 26 in 2011, which coincided with the introduction of Supercereals in 2010 (Annan, Web and Brown, 2014) (almost half the questions on the MAM forum in 2011 were on treatment), then gradually declined to 11 in 2017. The number of questions on IYCF remained relatively low between 2010 and 2014 but rose from 2014 onwards, with issues arising from the European refugee crisis (there was also a lot of activity around Ebola programming in West Africa during this period, but this was only generated from two questions). While the IYCF and MAM forums attracted equivalent numbers of questions and replies, the IYCF forum attracted many more 'views'. Although there were fewer questions posted in some months, this is not necessarily indicative of a lack of activity as lively debate is often generated in the form of replies to individual questions and 'old' discussions continue to attract views over time.

Infant and young child feeding interventions

The IYCF forum was well used and most questions were adequately answered (74% fully and 6% partially). Common question topics included: breastfeeding issues; management of non-breastfed infants; support for mothers; monitoring and evaluation for IYCF interventions; effective interventions to address or prevent stunting; dietary diversity; and complementary feeding practices. A discussion thread on IYCF in the context of the Ebola virus in 2014⁵ generated 78 replies and 18,225 views and catalysed rapid, consensus-based interim guidance on this topic and subsequent World Health Organization (WHO) guidance (WHO, 2016). Several posts (n = 6) exposed potentially harmful IYCF practices in the media or in partner reports. When these involved reports by a non-governmental organisation (NGO) or United Nations (UN) agency, the IYCF community moved to communicate directly with them to resolve the issue. It appears that mainstream media/news outlets were not contacted directly. Key IYCF programming challenges reflected in en-net discussions are summarised in Table 2.

Prevention and Treatment of MAM

Questions on the MAM forum were commonly related to a specific treatment/approach (29%) (e.g. *Can Plumpy-Sup be used for blanket supplementary feeding (BSFP) in the absence of Plumpy/Doz?*) or involved a request for a specific document or guideline (28%). Discussions relating to admission and discharge criteria in special circumstances were also common (17%); for example, using MUAC-only for admission and discharge (see Figure 3). The majority (72.4%) of questions were successfully answered (17.3% were not resolved, 10.4% partially resolved). Disagreement was detected in 6% (n = 7) of questions.

Table 1 en-net activity by thematic area

	IYCF interventions	Prevention and treatment of MAM	Prevention and treatment of SAM	Assessment and surveillance
Dates analysed	February 2009 to June 2018	February 2009 to Oct 2018	February 2009 to September 2018	Feb 2009 to June 2018
Total no. of questions	149	143	316	376
Total no. of replies	614	558	1,063	1,704
Total no. of views	394,816	400,526	823,610	996,268

Table 2 Key programming challenges discussed on IYCF interventions en-net forum

Breastfeeding support: A common topic (20% of questions) centred on the need for appropriate advice for women with low milk supply concerns, beyond advice on "frequent suckling". While a wealth of global knowledge and guidance exists, it has not necessarily been adapted to emergency realities (e.g. limited resources, client access and counsellor capacity). There were also discussions around wet nursing and relactation in emergencies, where operational guidance with practical suggestions on intervention design and clear protocols are lacking.

Support for non-breastfed infants: Multiple questions were raised around the sourcing and stock management of ready-to-use infant formula (RUIF), on upholding the International Code of Marketing of Breast-milk Substitutes (the Code)⁶ while supplying breast-milk substitutes (BMS), and how to appropriately handle intercepted donations or expired products. Discussions on supporting non-breastfed infants indicate a lack of clarity in how to put the recommendations of Operational Guidance on Infant and Young Child Feeding in Emergencies (OG-IFE) into practice in particular situations or contexts.⁷

Monitoring and reporting Code violations in emergencies: Discussion reflected a lack of clear global channels for reporting Code violations during an emergency, as well as a lack of clarity on specific actions to take in-country to prevent and act on Code violations.

Cultural reasons or barriers leading to inappropriate breastfeeding practices and how to address these during emergencies: This also appeared to be a knowledge gap; evidence and case studies seemed to be lacking that link IYCF to behaviour change and that examine what is feasible to achieve in various stages of an emergency response.

The difference between IYCF corners and mother-baby areas (MBAs)/baby-friendly spaces: Several guidance documents exist on MBAs but are based on individual agencies' programme designs and harmonisation is lacking. Confusion exists with regard to differences in terminology, functions and minimum requirements.

Mother-to-mother support groups and care group models: Global guidance on the implementation of these models exists; however, questions remain around the differences between them and how to effectively lead support group discussions beyond simply providing messaging.

Monitoring and evaluation (M&E) of Infant and Young Child Feeding in Emergencies (IYCF-E) programmes: Continued challenges were on assessing the outcomes and impact of IYCF-E interventions (tools, indicators, appropriateness of survey methodologies) and training. See Table 5 for IYCF-E questions in the assessment forum.

Complementary Feeding: Questions raised on en-net (on cooking demonstrations and impact of kitchen gardens) were addressed, but a consolidated body of evidence and experiences available to easily refer to appears to be lacking.

Direct impact of IYCF interventions on the reduction of stunting and wasting: Questions on impact were not answered, which may be due to a lack of existing or easily available collated evidence.

⁴ <https://smartmethodology.org/>

⁵ www.en-net.org/question/1445.aspx

Table 3 Key programming challenges discussed on MAM en-net forum

Expected caseload for targeted supplementary feeding programme (TSFP) recipients: Discussions raised the need for a standardised template to take account of factors such as estimated change in population, coverage and prevalence in order to estimate caseloads and forecast supply needs.

Exit types: Discord was detected on definitions and timelines for different exit types from a MAM programme.

Use of nutritional products for the prevention of MAM: The issue was whether there is a place for products in the prevention of MAM and if so, how, for how long and whether they should be reserved for humanitarian responses and/or specific groups of vulnerable persons. Discussions suggested the need for more evidence and clear guidance.

Changes in MUAC during supplementary feeding: In the case of MUAC-only admissions, questions were raised on how MUAC evolves over the course of MAM treatment to help benchmark progress and recovery of children.

Admission of pregnant and lactating women (PLW) with MAM: Discussion highlighted that pregnant women with MAM are often not admitted into treatment programmes during their first trimester of pregnancy, a critical phase of foetal development.

Table 4 Key programming challenges discussed on SAM en-net forum

MUAC: MUAC measurements were a common topic, including discussions on cut-off points and MUAC-only admission and discharge criteria. Calls were made for more sharing of evidence and experiences and the need for clear guidance on protocols for MUAC-only programming.

Programming where SAM and MAM treatment are not both in place: Discussions included the use of expanded criteria for therapeutic treatment in emergencies and combined protocols, such as MAM and SAM management using one protocol and product. Users sought practical recommendations on these new approaches and protocols for when MAM or SAM treatment are not in place.⁸

Coverage: Practitioners regularly report difficulties in achieving levels of coverage to adhere to SPHERE standards, raising challenges related to programme quality and implementation.

Stock shortages of therapeutic products: Questions regarding appropriate responses to stock shortages in stabilisation centres (SCs), outpatient therapeutic programmes (OTPs) and supplementary feeding programmes (SFPs) were common, as well as questions on modified treatment protocols, rations and reporting. Specific questions included how to treat malnourished pregnant women in the absence of corn-soy blend (CSB), what to do in the absence of therapeutic milks (stabilisation centres), and guidance on longer supply of ready-to-use therapeutic food (RUTF) in poorly accessible areas.

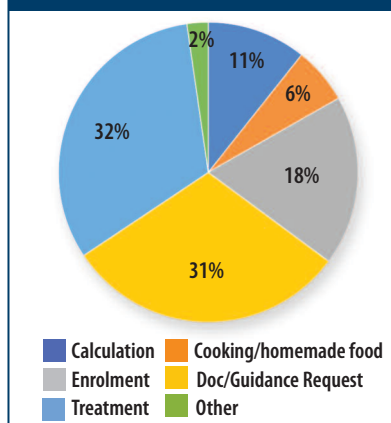
Procurement of therapeutic products based on caseload estimation: While procurement tools for various countries and programmes were shared on en-net, many questions remained around calculating the number of people affected by malnutrition for programme planning purposes. The need for a global procurement tool for all products was also raised.

Community-based management of acute malnutrition (CMAM) transition strategies: There was disagreement in discussions around how to handle closure of NGO-supported CMAM programmes (exit strategies).

Local production of therapeutic products for use in outpatient care: Several posts were made on this topic, with shared examples and recipes from India and Bangladesh; however, there is no global guidance on local production of RUTF.

SAM and cholera treatment guidance: While this is an area of attention and guidance development, appropriate nutritional care of cholera patients who are acutely malnourished continues to present significant challenges for practitioners.

Figure 3 Topics of questions on the MAM en-net discussion forum



Technical gaps most commonly fell under the sub-themes of 'enrolment' (n=7) and 'specific treatment/special cases' (n=6). The main programming challenges discussed are summarised in Table 3.

Prevention and Treatment of SAM

The most popular question themes were on programme implementation and monitoring (38%) and products used to treat SAM (23%). Under these themes, the most common questions were on MUAC (cut-off points and MUAC-only admission and discharge) and incompatibility between SAM and MAM programmes (such as limited co-location of SAM and MAM programmes and ineffective referral systems between programmes). There was also a significant number of questions on stock procurement and shortages. Clinical questions on specific treatment protocols and questions on research methodology or requests for background information to inform research made up 11% and 5% of technical questions respectively. Questions raised regarding community-based management of infants under six months old prompted the development of a dedicated en-net forum on management of at-risk mothers and infants less than six months old (MAMI). Prominent issues within the SAM forum area are listed in Table 4.

Assessment and surveillance

The assessment and surveillance forum was the most frequently used forum, with several posts generating significant debate. Half of the discussions were specific to surveys and how to put guidance into practice. Around one third of questions (29.2%; n=110) were general questions or discussions related to assessment, while 20.7% (n=78) were general survey questions (see Figure 4).

The most common themes discussed were anthropometric indicators (42.4%), assessment methodology/type of assessment (35%), and statistical tests, formulas, data and thresholds (27.9%). Prominent and recurring discussions have included when and how to use and interpret the various anthropometric indicators (MUAC, weight-for-height z-score (WHZ), weight-for-age z-

score (WAZ) and MUAC-for-age); the pros and cons of knowledge, attitude and practice (KAP) surveys; how to achieve a sample large enough to examine IYCF indicators when conducting a nutrition/ SMART survey; and how to evaluate programme impact (see Table 5). Additional questions covered included ones on software-based analysis, assessment in pastoralist populations, urban settings, nutrition surveillance, and assessment of adults and older people.

The vast majority (88%) of questions were successfully answered; 7% were not successfully answered and 5% only partially answered. Gaps in knowledge or guidance most commonly identified were those under the themes 'different types/methodology of assessment' (n=14) and 'planning, sampling, questionnaire/indicators and analysis' (n=12).

Recommendations and potential links with the GTAM

This analysis provides a valuable snapshot of technical challenges faced by practitioners in frontline nutrition programming. Questions on en-net often relate to issues where no firm guidance exists, where assistance is needed to translate or adapt existing guidance into practice or a specific context, or where there is a lack of awareness of what global/country-level guidance exists. Answers from en-net peers/moderators may provide practical illustrations of what is happening elsewhere or a steer that is based on respondents' knowledge or the opinion of the technical expert moderating that area.⁹ It was beyond the scope of this review to comprehensively determine which of the outstanding/recurring questions on en-net are true evidence or guidance gaps and which reflect poor awareness/application/accessibility of what is available. However, the findings have identified key technical areas that warrant more scrutiny and insights into future ways of working for en-net and the GTAM.

Handling unresolved technical questions

A key challenge identified in this review is how to handle unresolved technical questions, both within en-net and, looking ahead, via the GTAM. Within en-net, questions are only escalated to technical moderators when there is contention or lack of resolution or if the question is critical or urgent. This is to make the most of the limited time that these committed individuals have. In general, unan-

⁶ www.who.int/nutrition/publications/code_english.pdf

⁷ Since the en-net review took place, a paper has been published, Considerations regarding the use of infant formula products in IFE programmes (Gribble & Fernandes, 2018), which could be used as a starting point.

⁸ A dedicated forum on simplified approaches to acute malnutrition that includes combined SAM/ MAM treatment approaches was launched on en-net in July 2019.

⁹ It is important to note that more straightforward questions to en-net are handled 'offline' by the en-net moderator to retain the online forum for discourse regarding challenging issues benefiting from peer and technical expert inputs.

Table 5 Key programming challenges discussed on assessment and surveillance en-net forum

Deciding on which measures or combination of measures (MUAC and WHZ to use for programme admission and discharge): There were many questions on en-net debating which method is best used for determining acute malnutrition, particularly the influence that body shape has on these measures.

Inclusion of infants 0-5 months old in nutrition surveys: There is lack of clarity on when infants age 0-5 months should be included in surveys and methodological/practical implications.

Assessing nutritional status of pre-adolescents and adolescents: Discussions reflected a lack of consensus on the most appropriate anthropometric indicators to assess school-age children and adolescents.

Assessing nutrition status of PLW: Discussions debated the most appropriate approach to assess nutritional status and admit PLW into treatment programmes, given divergent measurement approaches and their interpretation (e.g. different countries use different MUAC cut-offs).

Inclusion of IYCF indicators in SMART surveys: Practitioners carrying out SMART surveys found it difficult to determine which additional IYCF indicators can be included while maintaining a sufficiently high degree of precision to inform programme decisions.

KAP surveys: Ten discussions were generated around this topic, particularly around the need for clarity on when it is appropriate to conduct a KAP survey (objectives) and how to do so (questions on sample-size calculations (n=4) and how to combine with SMART methodology). This indicates that available guidance may not be sufficiently detailed or practical and the need for indicators and standardised questions for various sectors.

Advanced analyses on nutrition surveys: Examples included issues on stratifying clusters, cross-tabulations when analysing nutrition surveys and how to implement weight factor for survey results. Frequent requests for SMART survey training were also noted.

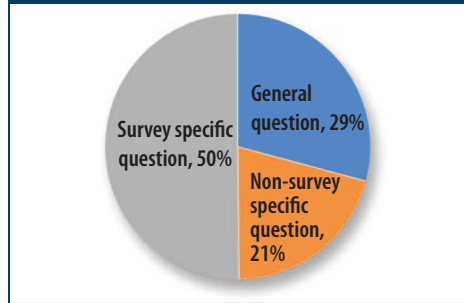
Sampling frames where population-size information is unavailable: While the SMART methodology provides guidance, many questions were raised about sampling and determining population size in contexts where there is no reliable population-size data.

Flags (extreme values): Discussions reflected a lack of consensus around what flags should be used for analysis of MUAC data, due to the lack of a MUAC reference population.

Gender considerations in measuring malnutrition: An unresolved debate remains on en-net on the apparent higher prevalence of undernutrition in boys, including whether the WHO Child Growth Standards themselves preferentially identify boys.

Measuring feeding practices and diet quality of children over two years of age: Questions remain on which indicators are appropriate (and in which contexts) for determining feeding practices and diet quality for children over two years of age (minimum acceptable diet (MAD) indicator focused on children under two years old).

Figure 4 Challenging questions on the assessment and surveillance forum



answered or unresolved questions may be due to poorly phrased questions, lack of moderator availability, inability by users/moderators to answer the question, low relevance to other users, no need for a response (e.g. announcement), and/or users being less willing to reply to anonymous users (e.g. 41% of questions on the MAM forum). There may also be wider influences. For example, the prevention and treatment of MAM forum was the most underused thematic area on en-net and 17% of posts had no reply. This may reflect the lack of attention to and evidence on MAM programming more generally in the nutrition sector (Shoham and McGrath, 2019), or possibly a lack of moderator capacity on this particular forum.

Moving ahead, we propose that en-net questions that have not received a reply within a defined timeframe are systematically flagged to technical moderators for review and response. Where moderators or the en-net community are unable to provide an answer (definitive or otherwise) or moderators judge that further consultation and consensus-gathering on an issue would be beneficial, the GTAM may play a role through its interaction with global thematic working groups to formulate a response. The IYCF in the context of Ebola experience shared earlier is a good example of a working model for such escalation in order to develop consensus-driven guidance in collaboration with an expert group and country stakeholders.

While technical debates on en-net and experience and knowledge of forum moderators are highly valued, outstanding technical disagreement or uncertainty may confuse and not serve the immediate practical needs of programmers. To help address this, we suggest that ENN and the GTAM collaborate to summarise difficult discussions, identify gaps in knowledge and guidance, and provide interim direction to programmers where needed.

Knowledge management

A wealth of advice, knowledge and experiences are shared on en-net. Users often use the search function to find previous discussions pertaining to the technical issues they are interested in. When first established, it was anticipated that questions when answered would be 'closed'; in practice, topics often remain current, are revisited and hence all discussion threads remain 'live'. The GTAM could use en-net as an open-resource on an ongoing basis to identify key technical issues facing programmers and synthesise learning from them. The GTAM could also use en-net to identify potential country case studies to examine technical challenges in more depth and facilitate cross-country learning.

Strengthening country networks and connections

The GTAM should only be used once country and regional capacities have been exhausted. en-net is used as a means to locate country-specific resources. For example, several Francophone and country-specific materials were provided in response to a request from the Democratic Republic of Congo for training materials.¹⁰ There is a potential role for the GTAM to play in strengthening this inter- and intra-country-level networking by directing country-specific questions to appropriate in-country contacts; this should help widen the en-net user base and the geographical spread of users. In other instances, country-specific questions are posed on en-net specifically because questions could not be answered in-country. An example of this is a request for assistance in interpreting the International Code of Marketing of Breast-milk Substitutes (the Code) in Bangladesh, where definitions are not aligned with global standards. In such cases, the GTAM could facilitate technical advice and expertise through (for example) escalating the issue to experts on the Code. An important area for ongoing examination by the GTAM will be how to determine if country and regional avenues have been explored and if there are gaps in technical assistance available at this level; whether due to evidence gaps or shortfalls in regional/country capacity. This raises the bigger question as to the role of GTAM and existing mechanisms in compensating for capacity shortfalls in the immediate and longer term.

Next steps

en-net is a well-used resource and has become the 'go-to' place for rapid, practical technical support. These findings substantiate the decision to integrate en-net within the GTAM service platform. Looking ahead, the authors recommend that the GTAM continues to monitor en-net to identify potential gaps and inconsistencies in knowledge and guidance and to help determine key challenges facing programmers.

Findings of this review should be triangulated with other reviews and existing knowledge and guidance to confirm whether a technical gap truly exists and to help inform initial priorities as the GTAM prepares to start providing technical advice, producing consensus-driven guidance and linking experts with implementers to ensure critical gaps are filled.

For more information, contact: Tamsin Walters, en-net moderator, tamsin@ennonline.net

¹⁰ www.ennonline.org/question/3629.aspx

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WFP/Hussein Al Saleh

Scale-up of malnutrition screening by the World Health Organization in Syria

By Mahmoud Bozo, Hala Khudari and Mutasem Mohammad



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Location: *Syria*

What we know: Nutrition surveillance is a valuable means to identify cases of malnutrition, facilitate timely treatment, monitor caseloads and so plan services.

What this article adds: A pilot nutrition surveillance system (NSS) was established by the World Health Organization (WHO) and Ministry of Health (MoH) in 2014 in Syria, based on existing growth-monitoring services at 115 health facilities. The system was expanded to screen children at 802 health centres by 2018. Identified cases are referred for community-based management (86 centres) or to stabilisation centres (23) as appropriate; surveillance data informs district and national planning. From 2017, health-worker training and computerised reporting systems improved data collection and reporting quality. In 2018, of 928,000 children screened, 1.8% were moderately malnourished and 0.6% severely malnourished (0.1% complicated). System reach was expanded through mobile health teams to conflict-affected populations, non-governmental organisations and private doctors. Prevalence of global acute malnutrition (GAM) (12%) and stunting (30%) was considerably higher than national average among those identified via mobile screening. Capacity to manage complicated and uncomplicated acute malnutrition was increased through coordinated WHO, United Nations Children's Fund and World Food Programme support. Nationally, GAM prevalence declined from 2015 (5.25%) to 2018 (2.4%). This was due to stabilisation of the situation and continued humanitarian support to meet basic needs, supported by early case detection and referral; more effective community-based management of acute malnutrition services; and infant and young child feeding interventions. Besieged populations remain highly vulnerable. Plans are to increase NSS coverage and to integrate into the national health information system.

Background

Eight years of protracted crisis in Syria has had an immense negative impact on the living conditions of the population. Violence, interruption of services and forced displacement have compromised access to basic commodities and services, including food, livelihoods, safe drinking water, sanitation, education, shelter and healthcare. This has increased the population's vulnerability to poverty, food insecurity, poor dietary diversity and disease. This, coupled with inadequate infant, young child and maternal feeding practices and geographical and gender inequalities, has greatly heightened the risk of malnutrition in children under five years of age.

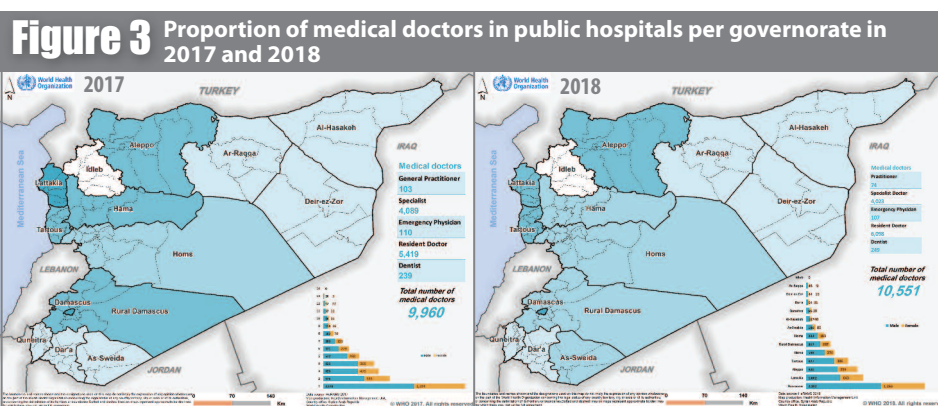
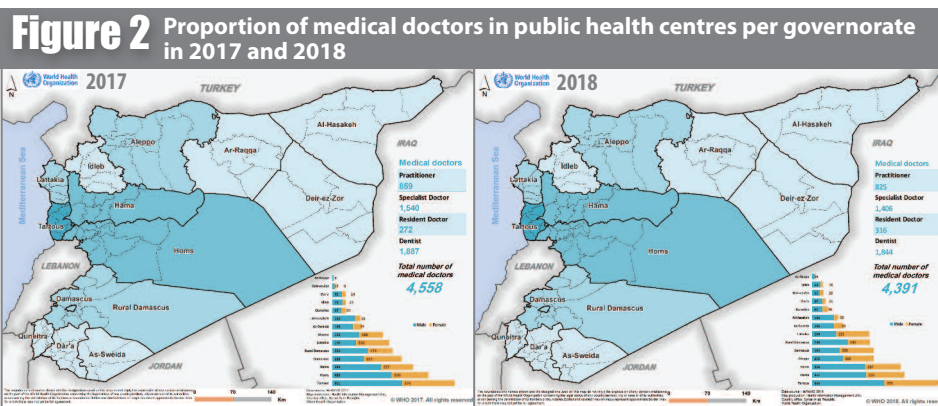
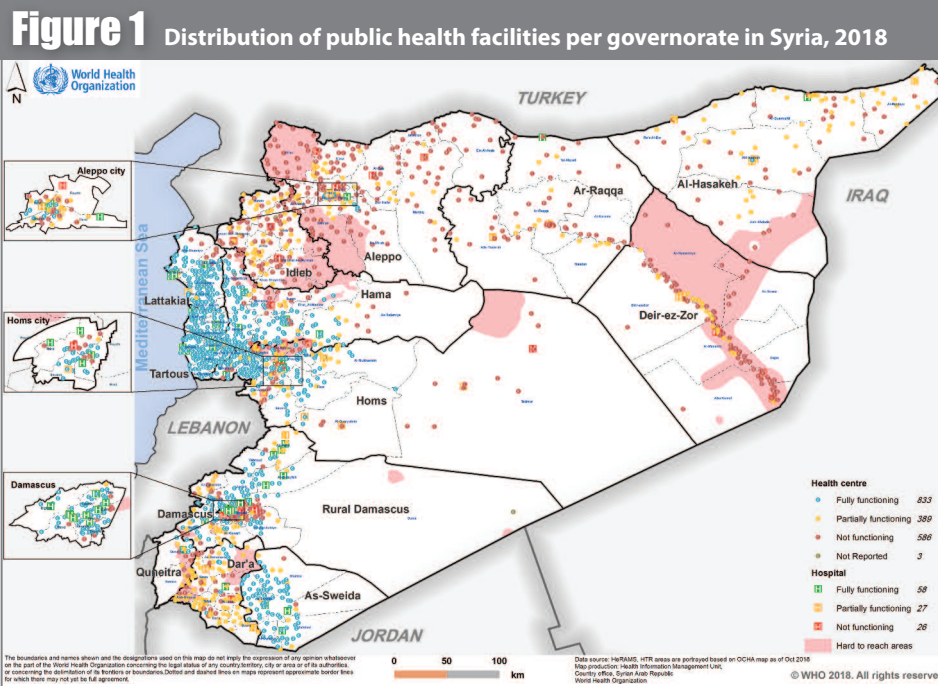
Impact of the crisis on the health system

Health service delivery in Syria has been heavily disrupted as a result of the crisis and attacks have left health centres damaged and, in some cases, non-functional, significantly reducing the availability of essential health services to affected populations. By the end of 2018, out of 1,811 public health centres assessed, only 68% were reported to be functioning (46% fully and 22% partially) and, out of 11 public hospitals, 76% were reported to be functioning (52% fully and 24% partially). Thirty-one per cent of health centres were reported damaged (7% fully and 24% partially), as well as 45% of hospitals (11% fully and 34% partially) (HeRAMS 2018a; HeRAMS 2018b). Figure 1 shows the location of functioning and non-functioning health centers

and hospitals across the country, which shows highly vulnerable and hard to reach or besieged areas with limited health services. This situation has been exacerbated by the fact that 50% of health workers have either fled from Syria or to safer locations within the country. Health workers are concentrated in areas considered safer (largely in the central governorates) with reduced availability of skilled health workers in vulnerable areas in the northeast, northwest and southern parts of the country (Figures 2 and 3).

Responding to the emerging need of malnutrition

According to the Syrian Family Health Survey (2009), the nutrition situation of children under five years of age was already poor pre-crisis (23% stunted, 9.3% wasted and 10.3% underweight). Only 42.6% of infants under six months old were exclusively breastfed and only 42.2% of newborns were introduced to breastfeeding within the first hour of birth (WHO/MoH, 2009). Micronutrient deficiencies were also common pre-crisis, including prevalent anaemia (29.2%, MoH, 2011), vitamin A deficiency (8.7%, MoH 1998) and iodine deficiency (12.9%, MoH, 1998) amongst under-fives. Neonatal mortality rates, infant mortality rates and under-five mortality rates stood at 12.9/1000, 17.9/1000 and 1.4/1000 respectively. Pre-crisis, severe acute malnutrition (SAM) was managed in paediatric departments in some main referral hospitals. Community-based management of acute malnutrition (CMAM) services have since been established



to cater for increased crisis-related burden. Supplementary feeding programmes (SFPs) and outpatient therapeutic feeding programmes (OTPs) are now co-located in 86 centres across the country, managed by the World Food Programme (WFP) and the United Nations Children’s Fund (UNICEF), respectively. Twenty-three stabilisation centres (SCs) for complicated SAM cases are based in public hospitals, supported by the World Health Organization (WHO).

Development of a nutrition surveillance system (NSS)

Prior to the conflict, a national NSS reported

cases of acute and chronic malnutrition among children under five years old visiting health facilities for routine immunisations (targeting all children under five years – an estimated 2.7 million children). This service was intended to provide parents with information on their child’s growth through routine monitoring. After the onset of the crisis, concerns regarding increased risk of malnutrition and poor case detection led to a pilot surveillance system in 2014, building on existing growth-monitoring services at 115 health facilities. This was later transformed into an emergency nutrition NSS which, by 2018, covered 802 health centres (WHO Syria Annual

report, 2018). The purpose of the NSS is to detect children with acute malnutrition for referral to management services at treatment centres. Global acute malnutrition (GAM) and other nutrition data are collected from public health centres and collated into national consolidated reports to inform evidence-based planning, forecast needs and evaluate programme impact. As children who attend centralised and decentralised health centres in multiple governorates for routine immunisations are monitored (except for inaccessible areas such as Idleb and parts of rural areas of Deir-ez-Zor and Raqqa), GAM rates through surveillance data are considered fairly representative of the country as a whole. Service coverage rates are not currently measured.

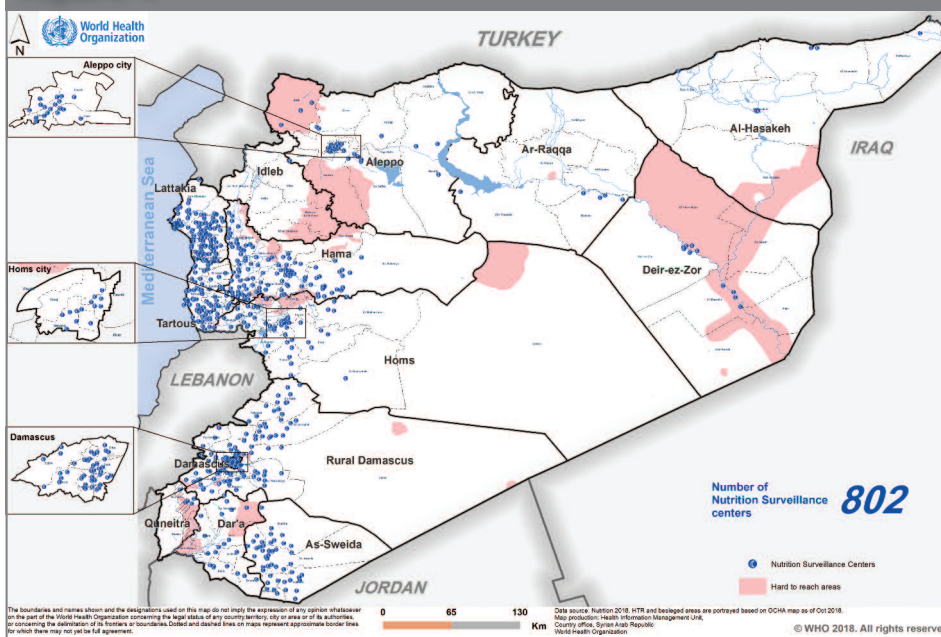
Pilot NSS system

The pilot initiative began in early 2014, in collaboration with the Ministry of Health (MoH), United Nations (UN) agencies and national non-governmental organisations (NGOs). The agreed logical approach was to adapt the existing NSS based on growth monitoring in selected health centres in 12 governorates. Adaptations included revised reporting and monitoring tools and training for health workers. The pilot governorates were selected using two criteria: (i) conflict-impacted areas (Daraa, Homs, Aleppo, rural Damascus, Idleb, Quneitera and Deir-ez-Zor); and (ii) densely populated areas with high numbers of internally displaced persons (IDPs) (Damascus, Tartous, Latakia, Hama and Sweida). In the selected health centres, coverage rates of nutrition surveillance, capacity of human resources, availability of physical space and equipment needs were assessed and gaps filled. Nutrition surveillance was also restarted in the highly conflict-affected governorate of Ar-Raqqa through the coordinated efforts of WHO field staff. Many constraints were reported by selected health centres during the pilot period, including lack of human resources, space, equipment and telecommunication-reporting utilities. These obstacles were especially evident in the case of Deir-ez-Zor, a significantly under-staffed and under-resourced area of the country. Despite these challenges, by the end of 2014, 115 health centres were integrated into the pilot NSS, covering 50,000 beneficiaries.

Countrywide NSS system – data and methods

Following the success of the pilot, the system was expanded to additional health facilities from 2015 onwards until, by the end of 2018, 802 health centres were included, screening a total of 928,000 children during 2018 (Figure 4). Of these children, 40% were aged under six months; 16.5% 6-12 months; 19% 12-24 months; and 25% 24-59 months. All children who attended the clinic were included in screening, including those who attended for immunisations and those seeing treatment for sickness. The NSS collects data on weight and height (to assess wasting and stunting), oedema, mid-upper arm circumference and on exclusive breastfeeding (maternal report). Cases of moderate acute malnutrition (MAM) are referred to SFPs, uncomplicated SAM to OTPs and complicated cases of SAM to SCs. WHO has worked closely with

Figure 4 Map of nutrition surveillance centres, 2018



the MoH, UNICEF and WFP (co-members of the Nutrition Cluster) to strengthen communication channels between different levels of care to ensure quality referral services. In 2018, 848 complicated cases were referred to SCs and 905 cases admitted; this suggests that the referral system is working.

Data was initially entered manually on paper-based registries, submitted monthly by health

centres to district level for collation and submission to Damascus. However, data quality was limited by human errors and a cumbersome (delayed) process. To address this, from 2017, monitoring, reinforced trainings, user-friendly Excel spreadsheets and computerised reporting were implemented at district and central levels. Reporting formats were improved further in 2018 to differentiate between new and returning cases in order to strengthen the quality of data, treatment and

follow-up. Since mid-2017, infographics such as those presented in Figure 5 are published on a regular basis to aid communication.

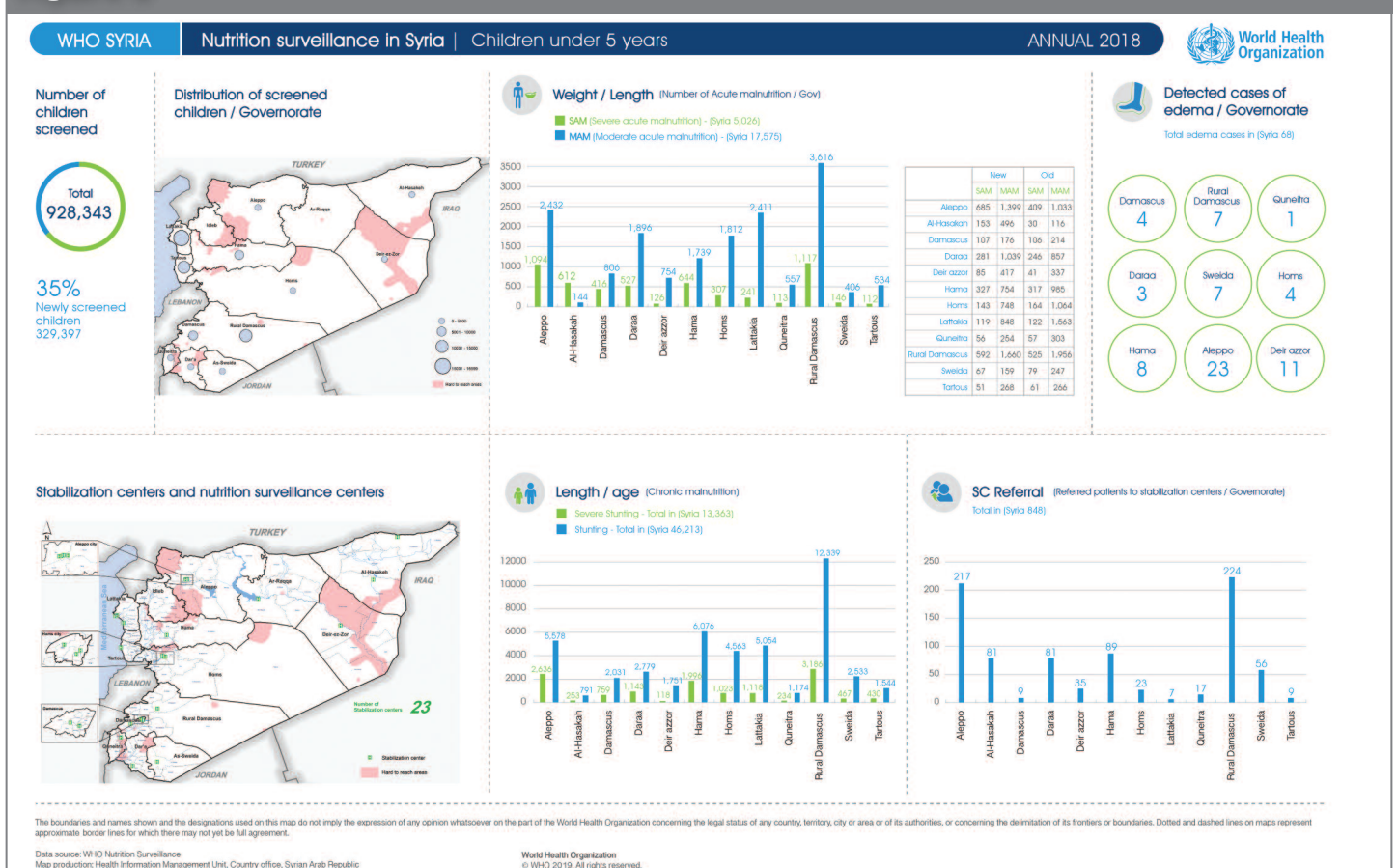
Engaging NGOs and the private sector

In areas where health services were severely disrupted, additional partners were needed to undertake nutrition screening. As a result, surveillance training was expanded to local NGOs able to perform screening in Homs, Aleppo, Hama, Hasekeh, and Raqqa in areas receiving large influxes of IDPs. Training was also provided to 30 private doctors in 2016 and 175 doctors in 2018 in eight governorates (Damascus, rural Damascus, Homs, Aleppo, Latakia, Tartous, Sweida, and Hama) in collaboration with the Paediatric Society. In Aleppo alone, 878 children were screened by private doctors in 2018. Of these, one was found to have complicated SAM, 12 uncomplicated SAM and 54 MAM. All cases were referred to the public health system for treatment.

Reaching the most vulnerable with nutrition screening

In situations such as the East Ghouta evacuation, the Raqqa offensive, or the latest displacement from Hajin and Baghouz in Deir-ez-Zor, hundreds of thousands of people who had been suffering from long-term food insecurity with limited access to health services, water and hygiene, arrived in informal settlements or camps needing urgent support. Among them, children under five years old were at particularly high

Figure 5 Infographic presenting data from the NSS, 2018



risk of malnutrition. In response, mobile teams were established, made up of NGO or MoH staff or trained members of the local community, to rapidly screen all children on arrival and refer identified cases of malnutrition for management. A total of 46 mobile teams have been supported by WHO to rapidly screen over 128,000 children in 2018, including in East Gh-outa, (70,000 children) Aleppo (4,500 children), Hassakeh (7,000 children), Daraa (26000 children), Quneitera (10,000) and Homs (10,000 children). WHO worked closely with UNICEF to share identified cases and UNICEF deployed mobile teams to provide CMAM services, with complicated SAM cases referred to the nearest SC. Among those screened, GAM prevalence was 12% (1% SAM and 11% MAM) and 30% of children were identified as stunted (higher than the national average of 2.4% in 2018).

Analysis of NSS expansion and GAM trends

Between 2014 and 2018, the number of nutrition surveillance centres expanded from 115 to 802, growing by approximately 200 health centres per year across the country (Figure 6) and increasing the number of children screened (Figure 7). In 2018, among 928,000 children screened, the prevalence of GAM was 2.4% (MAM 1.8%, SAM 0.6% and complicated SAM 0.1%); these cases were referred to SFP, OTP and SCs for treatment.

Since 2015, several approaches have been used to expand the NSS and associated treatment services, including:

1. Geographical expansion through an increased number of facilities integrating nutrition surveillance to increase geographical coverage of screening.
2. Capacity-building of health workers in selected health facilities on nutrition screening to increase the number of qualified health workers to undertake this activity.
3. Increased availability of nutrition supplies in health centres and hospitals providing nutrition services.
4. Increased monitoring and supervision of work established at facility level to help improve quality of care and nutrition services.

An improved security situation in some locations since 2015 (which increased access to facilities by beneficiaries, health workers and supporting agencies) has also facilitated surveillance and treatment. Figure 8 shows the increase in the number of health centres with integrated nutrition surveillance over time. By the end of 2018, the NSS was implemented in all governorates with the exception of Idlib, which was inaccessible from 2015, and Deir-ez-Zor, which was under ISIS control and inaccessible between 2015 and 2017.

The main aim of the surveillance expansion was to ensure early detection and treatment of acute malnutrition cases. Figures 9 and 10 show that overall GAM prevalence remained within moderate limits and reduced over time from 5.25% in 2015 to 2.4% in 2018 (928,000 screened); SMART surveys found 2.5% GAM in 2015 and 1.7% GAM in 2019. Governorates such as Damascus, rural Damascus, Homs, Hama, Latakia

and Tartous all showed reductions in GAM rates from 2015 to 2018, which can be explained by the stabilisation of the situation in these areas and continued humanitarian support to meet basic needs. Spikes that can be seen in Aleppo, Daraa and Hassakeh correlate to acute emergency situations, such as the evacuation in Aleppo at end of 2016, escalation of violence in Daraa mid-2018 and the massive displacement of people in Raqqa and Deir-ez-Zor to Hassakeh in mid-to-late 2018. As people moved from long-term besiegement or fled from violence to safer or more accessible areas, screening improved and the reporting of malnourished children consequently increased. In the cases of Hassakeh, Ar-Raqqa and Deir-ez-Zor that were under ISIS control prior to 2017, NSS did not expand as planned until later (2018-2019), when more NSS centres were activated.

Factors that likely contributed to the reduction of GAM in certain governorates include the implementation of the NSS system enabling early detection and referral; raised awareness among mothers of child health and malnutrition; strong infant and young child feeding interventions at health centre and community level by various nutrition partners; the improved food security situation; close management of SAM and MAM cases within the CMAM system, with follow-up at health centres and hospitals; improved security situation; and better living conditions.

Development of treatment services for acute malnutrition

Complicated case management

Prior to the crisis, the MoH took the lead on most nutrition-related initiatives and WHO provided technical guidance on growth monitoring and infant and young child feeding initiatives (e.g. the International Code of Marketing of Breastmilk Substitutes and the Baby-friendly hospital initiative). During the crisis, WHO took the lead in both nutrition surveillance and management of complicated SAM together with the MoH, NGOs and health partners. To manage complicated SAM, from 2014, WHO supported the establishment of 10 SCs within the paediatric departments of main public hospitals; additional SCs were established in private hospitals and implemented by NGOs where public services

Figure 6 Number of nutrition surveillance centres in Syria, 2014-2018

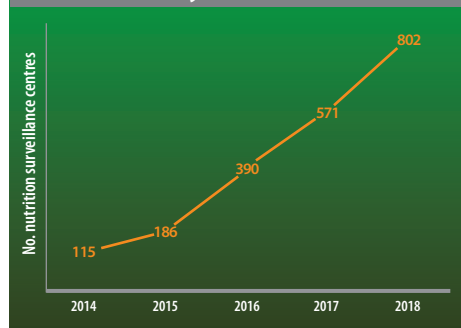


Figure 7 Number of children screened in nutrition surveillance centres, 2014-2018

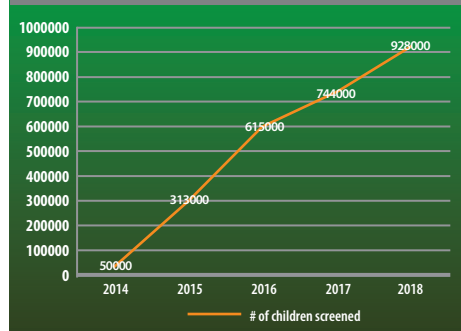


Figure 8 Number of health centres with integrated NSS 2014-2018 by governorate

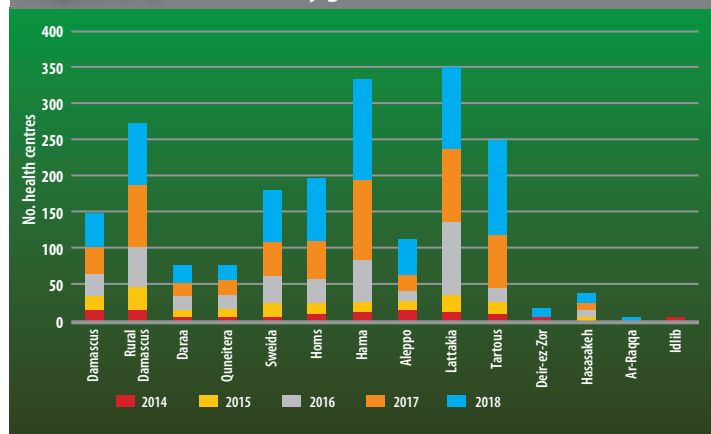


Figure 9 GAM prevalence identified through surveillance by governorate, 2015-2018

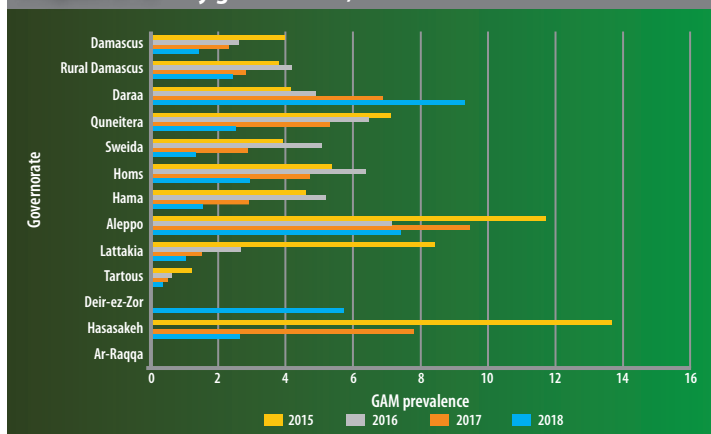
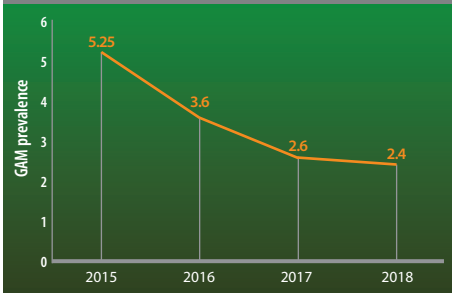


Figure 10 GAM prevalence identified through surveillance in Syria 2015-2018



were too badly damaged or inaccessible (Figure 11). WHO supported SCs with capacity-building of the health workforce (training 350 health in SAM management protocols to date); providing medicines, medical supplies and equipment for treatment of complicated SAM (e.g. anthropometric equipment, antibiotics, minerals, vitamins and F100, F75 formulas); and providing technical support for treatment protocols and reporting. Referral rates demonstrate strong complementarity of programmes; by 2017 all cases of complicated SAM referred to SCs were admitted, compared to 60% of cases in 2015. Furthermore, with continued capacity-building and support, programme implementation and quality has improved, reflected in reduced mean length of stay at hospital from 12 to approximately 6 days and reduced mortality from 9% to 2.2% in four years (Figures 12 and 13). This demonstrates high efficiency and quality of service.

Uncomplicated case management

UNICEF and WFP have supported public health centres to provide outpatient nutrition services

Figure 12 Mean length of stay in SCs, 2015-2018

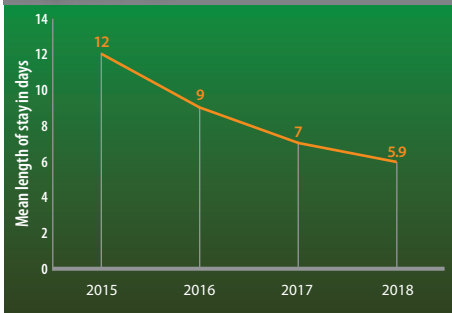


Figure 13 Mortality rate among complicated SAM cases at SCs, 2015-2018 (based on a total of 905 cases over the period)

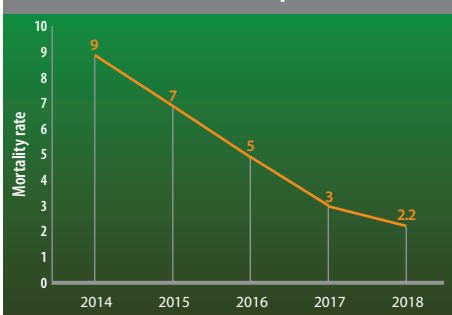
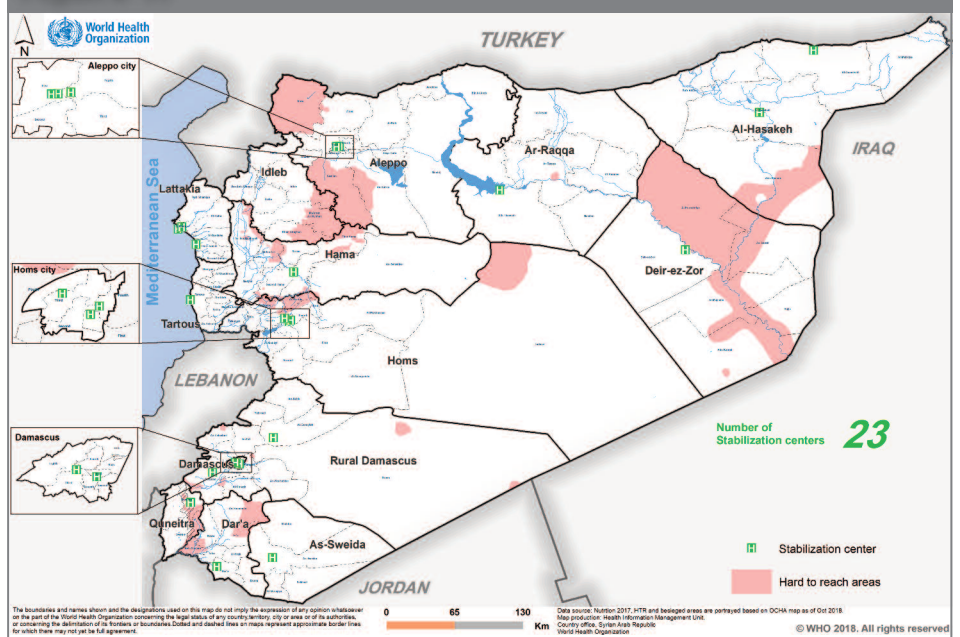


Figure 11 Location of SCs in Syria, October 2018



to manage uncomplicated SAM and MAM cases using the CMAM approach. Outpatient centres have expanded over time across the country and there is good complementarity between the NSS and inpatient and outpatient programmes, with referrals regularly happening between them.

Co-planning of services

Surveillance data, together with SMART survey data, are heavily relied on to estimate annual targets and caseloads to support WHO, UNICEF and WFP acute malnutrition programming. Implementation and linkages between SFPs, OTPs and SCs are managed by nutrition officers in MoH who have oversight of MoH activities at different levels and who play an important role in planning for expansion and deciding where new services are needed.

Conclusions

Transforming the existing growth-monitoring system into an NSS has had tremendous value in the timely detection and management of acute malnutrition in Syria. A strong network of trained health workers has been established and health facilities have been equipped to provide quality services for screening and case management. This has complemented interventions supported by UNICEF and WFP and has paved the way to strengthen CMAM interventions. Data provided by the NSS has enabled MoH, WHO, UNICEF and WFP to plan and design appropriate interventions and has provided vital information for country-level planning; for example, for the annual humanitarian needs overview and the humanitarian response plan, which are used to advocate for funds for the emergency response. NSS data has revealed a reduction in GAM rates since 2015; a trend consistent with SMART survey data. This suggests an improvement in the overall nutrition situation in the country and points to the benefits of quick referral, timely management of acute malnutrition cases identified, and complementary service provision. However, besieged populations

remain highly vulnerable; mobile services proved a successful approach to cater immediately for those displaced from inaccessible areas and securing humanitarian access remains a priority concern.

Future plans for the NSS are to increase screening coverage. Based on the immunisation target of 2.77 million children under five years old, just one third are currently screened for acute malnutrition, so there is room to go further. Other ambitions of WHO and MoH are to integrate surveillance services into all functional health centres and improve coverage of children in health facilities already within the NSS. Integrating NSS into health information system online platforms is also required to move health facilities from paper-based systems to further improve quality and timeliness of data. Moreover, with the slow shift to early recovery in parts of the country, the expectation is for the system to move towards routine growth monitoring (while continuing to report on acute malnutrition to inform the services still provided) with a renewed focus on stunting and other ongoing nutrition concerns, such as micronutrient deficiencies.

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Integrating nutrition services into mobile health teams: Bringing comprehensive services to an underserved population in Afghanistan

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



Joint monitoring visit at MHT service delivery point by AADA M&E officer and UNICEF health extender, Do Abe village, Qyasar District, Faryab Province, Afghanistan, 2019

Location: Afghanistan

What we know: Distance between remote communities and fixed health facilities in hard-to-reach areas can greatly impede service development and coverage.

What this article adds: Mobile health teams (MHTs) were rolled out by the United Nations Children's Fund with a local partner in 2018 to implement the Ministry of Public Health basic package of health services (BPHS) in remote/hard-to-reach communities in Faryab province. Four MHTs provided monthly antenatal care, postnatal care, immunisation, nutrition education and management of uncomplicated severe acute malnutrition (SAM) at agreed delivery points between February and December 2018, covering a population of 66,590. BPHS coverage increased by 10%; 19,187 children aged 6-59 months were screened for malnutrition, of whom 1,586 SAM children were successfully treated (94% cured, 4% defaulted and 1% died). MHTs were successful in improving coverage and service demand but are unsustainable in the longer term due to cost. The programme was extended for six months while capacity of government health sub-centres was built to provide services to the same communities.

Background

Afghanistan has struggled with protracted conflict for over three decades and is prone to recurrent natural disasters. Currently, 13.5 million people are estimated to be facing emergency levels of food insecurity (levels three and four of the Integrated Phase Classification).¹ Afghanistan has one of the highest rates of stunting of children under five years old in the world at 37%,² and an alarming level of under-five wasting at 9.5%.³ Only half of Afghan infants are exclusively breastfed during the first six months of life and only 16% of Afghan children aged 6-24 months receive a minimum acceptable diet that includes the right variety of food in the quantity needed for their age.

Remarkable improvements have been made in Afghanistan's health system in the past decade. Coverage of health services has increased from 60% in 2015 to 90% in 2019; child mortality has decreased from 257/1,000 in 2003 to 55/1,000 in 2015; and maternal mortality has decreased from 1,600/100,000 to 600/100,000. However, Afghanistan still faces considerable challenges.

Rural populations pay around nine times more for a one-way trip to a health facility than urban populations. Nutrition services remain limited and healthcare providers lack training to assess and offer counselling and treatment services for the management of malnutrition. Mothers and children living in remote and conflict-affected areas often do not access the Ministry of Public Health (MoPH) basic package of health services (BPHS) (Table 1), which is reflected in very low coverage of antenatal care, postnatal care, immunisation and nutrition services in these areas (all under 50%).⁴

Remarkable improvements have been made in Afghanistan's health system in the past decade. Coverage of health services has increased from 60% in 2015 to 90% in 2019;⁵ child mortality has decreased from 257/1,000

¹ Afghanistan Country Overview, ACAPS www.acaps.org/country/afghanistan/crisis/complex-crisis

² Afghanistan Health Survey, 2018

³ Afghanistan National Nutrition Survey, 2013

⁴ UNICEF Afghanistan: www.unicef.org/afghanistan/nutrition

⁵ Coverage estimate based on the population being within two hours of walking distance to the closest health facility.

Table 1 Seven elements of the MoPH basic package of health services (BPHS) in Afghanistan and their components

Maternal and newborn care	Antenatal care; delivery care; postpartum care; care of the newborn
Child health and immunisation	Expanded Programme on Immunisation (EPI); Integrated Management of Childhood Illness (IMCI)
Public nutrition	Prevention of malnutrition; assessment of malnutrition
Communicable disease treatment and control	Control of tuberculosis; control of malaria; prevention of HIV and AIDS
Mental health	Mental health education and awareness; case identification, diagnosis and treatment
Disability and physical rehabilitation services	Disability awareness, prevention and education; provision of physical rehabilitation services; case identification, referral and follow-up
Regular supply of essential drugs	Listing of all essential drugs needed

in 2003 to 55/1,000 in 2015; and maternal mortality has decreased from 1,600/100,000 to 600/100,000. However, Afghanistan still faces considerable challenges. Rural populations pay around nine times more for a one-way trip to a health facility than urban populations. Nutrition services remain limited and healthcare providers lack training to assess and offer counselling and treatment services for the management of malnutrition. Mothers and children living in remote and conflict-affected areas often do not access the Ministry of Public Health (MoPH) basic package of health services (BPHS) (Table 1), which is reflected in very low coverage of antenatal care, postnatal care, immunisation and nutrition services in these areas (all under 50%).

Intervention approach

Mobile health teams (MHTs) provide a vehicle to bring care closer to the homes of underserved populations living far from fixed health facilities and sensitise communities to health and nutrition services. In an effort to address outstanding challenges and to scale up the provision of the BPHS, an integrated model of mobile teams (health and nutrition) was piloted in four districts of Faryab province, northern region, Afghanistan (Figure 1). The pilot programme was implemented and funded by the United Nations Children's Fund (UNICEF) in 2018 as part of a broader emergency nutrition programme, in

partnership with the Agency for Assistance and Development of Afghanistan (AADA), a non-profit, independent, registered national organisation with expertise in implementing Afghanistan's BPHS and essential package of hospital services.

The goal of the project was to reduce maternal and child mortality among the most vulnerable, underserved and highest-risk communities in Faryab province by increasing access to integrated health and nutrition services. Faryab province was chosen due to its remoteness and the serious challenges that parts of its population face in terms of access to services. Functional health facilities do exist in Faryab; however, due to population distribution in very remote areas, the facilities are inaccessible to a portion of the population.

The MoPH approved two types of MHT to be integrated into the BPHS: reproductive, maternal and newborn child health (RMNCH) MHTs and 'all-age' MHTs. RMNCH MHTs target pregnant women and children under five years of age to provide reproductive, maternal and newborn child health and acute malnutrition services. 'All-age' MHTs provide the same services, but have additional components for adults, including mental health services, management of communicable and non-communicable diseases,

Figure 1 Location of Faryab province, northern region, Afghanistan

and trauma care.⁶ Four RMNCH mobile teams were established in Faryab province that aimed to cover around 20,000 people each. The MHTs are comprised of four health workers: a midwife; a vaccinator for the expanded programme on immunisation (EPI) and polio eradication initiative; a nurse or doctor to provide integrated management of neonatal and childhood illness (IMNCI) to children under five years old; and a nutrition counsellor. The nutrition counsellor supports the delivery of nutrition services, such as maternal and infant young child nutrition (MIYCN) counselling; iron-folic acid (IFA) supplementation for pregnant and lactating women (PLW); growth monitoring; uncomplicated severe acute malnutrition (SAM)/moderate acute malnutrition (MAM) case management according to the national community-based management of acute malnutrition (CMAM) protocols; vitamin A supplementation; and deworming. Complicated SAM cases are referred to one of the two inpatient service units in the province; although, given the remoteness of the location, it is estimated that only 50% of referred cases reach inpatient services.

For this pilot project, MHTs visited designated service delivery points (SDP) on a monthly basis between February and December 2018. SDPs were identified in a mapping workshop with local government, community leaders and implementing partners, and are located at village level in areas at least 10km from the nearest fixed health facility. Community groups (health shuras) were established in each SDP area, made up of six members representing the local population. MHTs regularly engaged with these community groups, who provided assistance to staff, including accommodation and security, and helpful feedback on the performance of MHTs to improve service delivery. The groups also helped to sensitise their communities to the services that the MHTs provide and supported MHT health-awareness activities concerning, for example, timely health-seeking behaviours, child health, safe drinking water and personal hygiene. To address the issue of treatment intervals in the context of CMAM, a mini nutrition team consisting of a small vehicle, a nutrition counsellor and supplies visits each SDP every



Almar MHT team members, Khoshbay village, Almar District, Faryab Province, Afghanistan, 2019

⁶ The Government has since unified the approach so that all MHTs in Afghanistan provide all-age services (including RRMNCH services).

two weeks to ensure continuation of SAM case management between MHT monthly visits.

All mobile teams operating in Afghanistan are registered in the Health Management Information System (HMIS) of the MoPH and provide regular reports to the HMIS for health services and to the online nutrition database for nutrition services. MHTs enter daily indicators into the BPHS record system and receive monthly supportive supervision from a BPHS coordinator. MHT staff were initially recruited and trained by the implementing non-governmental organisation (NGO) AADA using national certified master trainers. MHT staff also receive annual refresher trainings.

Results

Estimated baseline coverage of health services at the start of the project was around 70%. In the past year, HMIS shows that coverage of the BPHS in the four districts covered by MHTs has increased by 10-15% (2018). Districts with MHTs have roughly 10% more coverage than those without.

Over the pilot period a total of 66,590 people were reached with health and nutrition services; over half (57%) of whom were children under five years old. Active screening was not conducted by the MHTs due to the security situation and rough terrain. However, community sensitisation through the established community groups enabled passive screening of 19,187 children under five years old. Of these, 1,586 children aged 6-59 months were identified as having uncomplicated SAM (610 male and 967 female) and admitted to the MHT outpatient treatment programme (OTP). This surpassed the target caseload of 831 SAM children. Of these cases, six were identified as having SAM with medical complications and referred to the nearest inpatient treatment facility. By the end of the programme, 94% of the children who entered OTP treatment had been cured, 4% defaulted and 1% died.

During screening 2,451 children were identified as having MAM; however, there were no MAM services in Faryab province. To fill this gap, MHTs provided nutrition counselling and monthly follow-up growth monitoring to MAM children. Infant and young children feeding (IYCF) counselling and nutrition education reached 4,529 caregivers of children aged 0-23 months.

Other services provided by the MHTs also proved successful. A total of 2,070 children aged 0-11 months (82% of the project target) and 1,035 children aged 12-23 months were immunised with pentavalent-3;⁷ 1,931 children received the first measles vaccine; 1,194 children received the second measles vaccine; and deworming tablets were provided to 3,858 children aged 24-59 months. Reproductive health services were provided to many women who otherwise would not have had access to these services. A total of 3,486 women registered for the first antenatal clinic (ANC) visit; 1,737 for the second visit; and 1926 for subsequent visits. This translates to 89% of the project target for ANC2. Addi-



MHT vaccinator vaccinating children, Charkhi village, Almar District, Faryab Province, Afghanistan, 2019

tionally, 2,198 mothers received one postnatal care visit within 28 days of delivery.

Discussion

The MHT pilot was successful in raising awareness on and improving the coverage of health and nutrition services to remote populations in one province of Afghanistan. The main enablers of this success were the integration of health and nutrition service delivery into a single platform; community engagement to identify acceptable locations for service delivery; and good coordination with government authorities at provincial level. Another key factor was the support that communities provided to MHTs in the delivery of health-promotion activities and accommodation of MHT staff. While effective in the short term, there are still challenges to mobile service provision in this context, including:

- High cost: Bids for BPHS services that include MHT services are rarely accepted by the MoPH due to their high cost. On average, one integrated MHT costs around USD70,000-80,000 per year (there is no clear data on the cost of a fixed health facility against which to compare this).
- Limited coverage: The number of target villages exceeds the capacity of existing MHTs. Additionally, challenges such as rugged mountainous terrain, harsh weather conditions during the prolonged winter, insecurity and time taken for teams to move between villages remain barriers to greater coverage.
- Limited support to adult groups for communicable and non-communicable diseases: As RNMCH MHTs were delivered, rather than 'all-age' teams, the health kit included medicines to treat childhood diseases only (e.g. amoxicillin powder oral suspension, co-trimoxazole tablets and syrup, paracetamol, oral rehydration salts, and IFA for pregnant women). Adult communicable and non-communicable diseases were therefore left untreated.
- Exit strategy: Communities become reliant on these services, making it difficult to withdraw once funding or programming has finished.

To address some of these issues, UNICEF, in consultation with government and the imple-

menting NGO, agreed to extend the programme period by six months, during which time efforts were made to scale up SAM treatment services in health sub-centres (HSCs).⁸ HSCs are health facilities located closer to communities that cover a population of about 7,000 people, thus improving access to SAM treatment services in remote villages. Efforts to extend SAM treatment services through HSCs and phase out existing MHTs are ongoing. During the first three months of 2019, with Common Humanitarian Fund (CHF) funding, AADA built the capacity of HSC staff through formal trainings and provision of anthropometric equipment and other supplies. A total of 11 HSCs in the same catchment area as the pilot MHTs were upgraded to provide SAM, MAM and IYCF services. CHF support concluded on 30 August 2019 and the programme was at that point handed over to a new BPHS implementer (Sanayee Development Organization) to be continued with government funding. This strategy will allow remote villages to be reached without the high costs associated with MHTs.

Conclusion

MHTs have been an important vehicle in the immediate term to improve coverage of health and nutrition services in hard-to-reach areas of Afghanistan. They have also served to increase awareness among remote populations of the importance of health and nutrition services, sensitising them to seek services in future. However, considerable challenges remain in the use of this model, including high costs, impediments to physical access to certain pockets of the population and supply chain issues. Despite these limitations, this pilot programme demonstrates that MHTs can be a useful way of providing critical services in the immediate term while the capacity of the existing system is built up to achieve a more sustainable model of accessible healthcare.

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⁷ A five-in-one vaccination against diphtheria, tetanus, pertussis, hepatitis B and Haemophilus influenza B.

⁸ Vaccinations and deworming of children with clinical signs of gastrointestinal worms are already provided by HSCs as part of the BPHS. Other children also receive deworming on national immunisation days (NIDs).

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Front cover

Pregnant women eating a supplementary meal at an ICDS centre, West Bengal, 2018; CINI

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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.

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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)).

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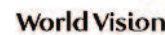


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