Editorial perspective on the continuum of care for children with acute malnutrition

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Rationale for FEX special edition

We are delighted to mark our 60th edition of *Field Exchange* with an issue dedicated to the continuum of care (CoC) for children with acute malnutrition (see Box 1). The global burden of acute malnutrition and numbers *not* accessing treatment justify our attention. An average of 50 million children under five years old are wasted worldwide, of whom 17 million are severely wasted and 33 million moderately wasted. In 2018 an estimated 10 million children with wasting, including 4.5 million with severe wasting, received treatment (WHO *et al,* 2019). This means that nearly three quarters of severely wasted children and 83% of moderately wasted children did not.

Several factors prompted us to embark on this special issue. Until now, the management of acute malnutrition has largely been through distinct programmes for complicated and uncomplicated severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) treatment. Separate institutional responsibilities of lead United Nations (UN) agencies for different degrees of malnutrition were identified in an ENN 2011 report as significantly contributing to observed disconnected programming (Shoham and Dolan, 2013). Efforts to re-align UN agency mandates and ways of working for a more effective care continuum for acute malnutrition appeared to gain momentum in 2018; we wanted to inform these. Furthermore, over the years, moderate acute malnutrition (MAM) treatment had not kept pace with severe acute malnutrition (SAM) treatment scale-up and we wanted to examine why. Significant developments, in the form of simplified/expanded/combined approaches to manage acute malnutrition, were emerging through research and programming. One key reason for this was to enable more joined-up programming. Overall, it looked like a good time to take stock. Nine months later, we reflect here on what we have learned.

Framing this special edition

Prevention, treatment and care

What constitutes prevention is poorly and inconsistently defined and what works is not well evidenced. There are different interpretations of what constitutes prevention and treatment of acute malnutrition, with overlap between how both are understood (e.g. MAM treatment can be a SAM prevention strategy). This lack of clarity appears to lend itself to arbitrary categorisation; e.g. provision of ready-to-use therapeutic food (RUTF) is considered as treatment, while enrolment in a blanket supplementary feeding programme (BSFP) and or social protection are considered as more preventive in nature. Some interventions apply a 'preventive' lens to management; for example, emerging approaches to manage at-risk infants under six months old are adopting a more public-health approach, considering community-based interventions as secondary *preventive* strategies embedded in existing health systems, frameworks and capacities.[2] Given multiple evidence gaps on what works for prevention, a soon to be published research prioritisation on wasting prevention should help inform direction.[3] Different interpretations of what constitutes prevention and treatment can breed confusion. We have not attempted to resolve this definitional impasse here.

Anthropometry and risk

The controversy over which anthropometric indicators are best to determine risk of mortality and functional impairment has raged long and hard among nutritionists. It is increasingly appreciated that anthropometry as an indicator of nutrition risk is flawed. Anthropometric indicators are a proxy for what is going on inside the body that leads to illness and death; e.g. impairment of major organs, compromised immune systems, that may have multiple causes not limited to undernutrition; e.g. in utero growth deprivation, social factors. Furthermore, anthropometric categorisation has limitations: wasting (identified using WHZ) and stunting (using height-for-age z-score (HAZ)) have been considered as distinct conditions in programming and in global narrative, with wasting considered a humanitarian problem and stunting the focus of the development sector. The work of the ENN-coordinated Wasting-Stunting Technical Interest Group (WaSt TIG) has challenged this paradigm.[4] There is increasing evidence that wasting and stunting are inter-linked and confer added risk of one to the other and that stunting is in part a biological response to previous episodes of being wasted (Schoenbuchner *et al*, 2019). Children who are both wasted and stunted (WaSt) at the same time have a risk of death which is similar to that of children who are severely wasted (McDonald *et al*, 2013; Myatt *et al*, 2017). Recent analysis by the WaSt TIG has found weight-for-age (WAZ) and MUAC better identify WaSt children (Myatt *et al*, 2017). Interestingly, WAZ and MUAC have also been identified by the ENN-coordinated Management of At Risk Mothers and Infants (MAMI) Special Interest Group (SIG) as the anthropometric indicators that best identify mortality risk in infants under six months old and select for low birth weight infants who have higher associated mortality than normal weight infants that persists to 12 months of age (Mwangome *et al*, 2019).

These developments have potentially significant consequences for caseloads and require management options that are not limited to nutrition interventions. The first ever analysis of concurrence based on 84 country datasets found pooled prevalence of concurrence (based on WHZ and HAZ) was 3.0% (giving an estimated burden of 6 million children); prevalence was significantly higher in fragile and conflict affected states (3.6% v 2.24%) (Khara *et al*, 2016). Since MUAC selects for stunted children, the prevalence among wasted children in current community management of acute malnutrition programme (CMAM) programmes is likely to be even greater; for example in the OPTIMA study in Burkina Faso, prevalence of concurrent stunting was 42% amongst children treated under a MUAC only strategy[5] (Phelan 2019). This means that, in practice, it is likely we are already selecting for these children in treatment programmes, but the optimal treatment regime for WaSt children is still to be determined. This is being increasingly considered by programmers (Phelan, 2019) and is the

Box 1 Continuum of care (CoC) for acute malnutrition – a definition

CoC for acute malnutrition means that any child receives appropriate, timely care to enable full recovery wherever they present along the spectrum of acute malnutrition.[1] Based on current guidance and practice categorisation, this encompasses children with Mid-Upper Arm Circumference (MUAC) <125mm or weight-for-height z-score (WHZ) <-2 who may be classified as moderately or severely malnourished, and both complicated and uncomplicated cases.

We recognise that risk identified may be a consequence of multiple factors and require interventions beyond nutrition. Different forms of treatment and support across sectors may be necessary, depending on the level of risk, circumstances and recovery phase. Attention to continuity of care is especially critical when there is service delivery through more than one programme/access point, requiring coherent and effective transition between services.

Complete CoC for acute malnutrition can only be secured by alignment with prevention programmes such as growth monitoring promotion (GMP), blanket supplementary feeding programmes (BSFP) and social protection, etc., as well as integration of services within health service systems.

[1] The terms 'wasting' and 'acute malnutrition' are in common use and in general refer to the same manifestation of under nutrition. However, both terms have shortcomings; e.g. 'acute malnutrition' implies a recent or more urgent condition, while 'wasting' does not include oedematous malnutrition. We use both terms interchangeably in the edition.

[2] www.ennonline.net/ourwork/research/mami

[3] https://www.ennonline.net/ourwork/researchandreviews/wastingprevention

[4] https://www.ennonline.net/ourwork/reviews/wastingstunting

[5] Prevalence of concurrent wasting and stunting was 56% for those with MUAC <115 mm at admission; 46% for those with MUAC 115-119 mm; and 37% for those with MUAC 120-124 mm.

WFP Library/WFP Pakistan

A child at a TSFP site for his follow-up visit, Pakistan

subject of a new research project in ENN. While WAZ identifies high risk infants and children it has some practical constraints since it relies on age assessment that introduces imprecision. Referral of children where their age is accurately known (e.g. through growth monitoring, at vaccination) may be most feasible and existing programmes that already use WAZ, such as in India (de Wagt *et al*, 2019) are arguably already ahead of the curve. In future, we may well see technological advances that enable much more sophisticated and specific assessment of individual nutrition risk and earlier identification of decline to inform case management. These may not involve or rely so heavily on anthropometry.

Back now to 2019, where the current operational world is underpinned by agency mandates and normative guidelines still largely delineated between wasting and stunting along humanitarian and development divides, between prevention and treatment, dependent on anthropometric indicators and focused primarily on children over six months of age. We share and examine experiences and research configured on this currently defined 'reality'. However, it is important that the emerging strong, consensus-based and evidence-driven direction of travel around new ways of assessing and managing at risk children are factored into future programme experience capture, research agendas, and ultimately new ways of working.

Scope of content

A CoC for acute malnutrition requires comprehensive and aligned policies, guidance, financing and programming to ensure adequate, appropriate and accessible services, with capacity to surge to meet demand or challenges in crisis. This has informed our selection of programme experience and research studies for this special edition. There are eight field articles, 19 research pieces and one evaluation. A fuller description of the material in this special issue can be found in our opening editorial. We have also conducted interviews with senior staff in the four main UN agencies – UNICEF, UNHCR, World Food Programme (WFP) and World Health Organisation (WHO) – responsible for treatment of acute malnutrition, and the No Wasted Lives Coalition (NWL), to better understand roles and responsibilities, challenges faced and agency visions going forward. An interview with the Global Nutrition Cluster (GNC) provided insights around coordination in crises. In addition, we mapped UN supported SAM and MAM services in East and West Africa to provide the first multi-country snapshot of how CoC for acute malnutrition is playing out in programming.

Setting the scene

Evolution of treatment arrangements

Current programming arrangements and systems reflect a considerable story of evolution over 20 years or so; understanding where we are now is informed by reflecting on how we got here. The development of the Community Therapeutic (CTC)[6] model and subsequent Community based management of acute malnutrition (CMAM) approach in the late nineties was a major innovation in the humanitarian sector. Complicated[7] cases of acute malnutrition (both moderate[8] and severe) would still require admission for stabilisation, while uncomplicated SAM and MAM would be treated in outpatient care. In practice, delivery was modelled around programmes and arrangements typical for emergency contexts. UNICEF, where technical nutrition knowhow resided, took charge of outpatient care for uncomplicated SAM, including Ready to Use Therapeutic Food (RUTF) supply, while the World Food Programme (WFP) – whose established forte was food assistance – took charge of targeted Supplementary Feeding Programmes (TSFPs), and therefore 'MAM'. WHO, as lead UN health normative agency, was assumed to have continued responsibility for children with complicated acute malnutrition; since WHO guidance only existed for SAM treatment, this centred on complicated SAM. Reflecting in large measure prioritisation of children most at risk of death, CMAM quickly focused on SAM treatment, as demonstrated in the 2007 joint UN statement on community-based management of SAM (WHO *et al*, 2007). A huge drive since, largely led by UNICEF, to roll out community-based SAM treatment integrated within existing health systems has led to further evolution of the model of treatment for outpatient SAM management. This has not been matched by equivalent attention to scale-up of MAM treatment and prevention.

An important factor contributing to this SAM/MAM disparity has been lack of clear direction on MAM management; WHO global guidelines on SAM exist, have informed national guidelines that are relatively constant, and so enabled integration of SAM treatment into health systems in a fairly consistent manner. In contrast, the lack of WHO global guidelines on MAM has meant lack of equivalent models for scale up including but not limited to health system integration which has a created a vacuum filled by varied national and agency policy guidance and practice and biased towards humanitarian settings.

Are MAM children at risk?

Given the above, we examined evidence on risks associated with MAM and implications of not providing care. Published evidence shows that all degrees of anthropometric deficit (WAZ, HAZ and WHZ) are associated with substantially increased risk of under-five mortality, especially from infectious diseases (Olofin *et al*, 2013). Mortality risk increases along a continuum; an exponential rise only occurs in the very severely wasted/stunted/underweight child (WHZ/HAZ/WAZ <-4). Published pooled analysis identifies sick moderately wasted children at heightened risk of death (Black *et al*, 2008). Recent randomised nutrition trials in Niger (Isanaka *et al*, 2015), Burkina Faso (Cichon *et al*, 2006) and the TREAT-FOOD trial (Fabiansen *et al*, 2017) demonstrate a range of significant morbidity in moderately malnourished children. Published work by van der Kam *et al* in Nigeria found one third of post-infection MAM children developed SAM during the six-month follow-up period. Concerns regarding higher-risk MAM children are reflected in research (Phelan, 2019) and programming articles (de Polnay (2019; Hanson, 2019) in this issue of *Field Exchange*. Research is underway in Sierra Leone to examine outcomes among high risk MAM children admitted for treatment compared to a control group (routine care) (Lelijveld *et al*, 2019 [1]).

Evidence around so called 'spontaneous recovery' is limited as most MAM studies lack controls (Lelijveld *et al*, 2019 [2]). Definitions of 'recovery' also have shortcomings; i.e. determined by anthropometric gain, which is a marker, but not the ultimate outcome, of treatment. Bearing this in mind, several studies find that a considerable proportion of MAM children without intervention fail to recover or decline to SAM, in both food-secure and insecure environments. James *et al* (2016) found 54.2% of MAM children (defined as MUAC >110mm) in a stable and food-secure situation with no intervention recovered within seven months of follow-up; one third of children remained MAM and 9.3% had at least one episode of SAM. Amahu *et al* found that, without treatment, the vast majority of MAM children (79%) from food-insecure households and 40% of children from food-secure households remained moderately malnourished or declined to SAM by two months of follow-up. Household food security, duration of exclusive breastfeeding, dietary diversity, low maternal MUAC and unplanned pregnancy were all associated with low child MAM recovery. No data are presented in these studies on whether 'recovered' MAM children developed other deficits; e.g. became more stunted or anaemic. One study included in a systematic review of MAM interventions summarised in this edition of *Field Exchange* found that, while 71% of children receiving nutrition counselling 'recovered', these children became more stunted. Recovery in terms of wasting in the absence of treatment but decline in other indicators of undernutrition has also been documented in infants under six months of age (Munirul *et al*, 2018). More insights may emerge in soon-to-be-published analysis by The Bill and Melinda Gates Foundation's Knowledge Integration (KI) initiative, using aggregated data from more than 190 studies that includes regional and age-specific patterns in child wasting, including spontaneous recovery (*Field Exchange* 60.)

[6] Community based therapeutic Care (CTC). A Field Manual. First edition, 2006. www.validinternational.org/bahwere-et-al-community-based-therapeutic-care-ctc-a-field-manual/

[7] Medical complications in infants and children include severe bilateral pitting oedema, marasmic kwashiorkor, anorexia, intractable vomiting, convulsions, lethargy or not alert, unconsciousness, lower respiratory tract infection (LRTI), high fever, dehydration, persistent diarrhoea, severe anaemia, hypoglycaemia, hypothermia, eye signs of vitamin A deficiency, and skin lesions. Source: Training Guide for Community based Management of Acute Malnutrition (CMAM), 2018. www.fantaproject.org/focus-areas/nutrition-emergencies-mam/cmam-training

[8] Children with MAM and medical complications are admitted to supplementary feeding services or programmes (such as SFPs in the emergency context) and receive supplementary food rations, but are referred for medical treatment and return to supplementary feeding when medical complications are resolved. Source: Training Guide for Community based Management of Acute Malnutrition (CMAM), 2018. www.fantaproject.org/focus-areas/nutrition-emergencies-mam/cmam-training

The published and operational evidence indicates that children on the moderate end of the anthropometric spectrum (currently categorised as MAM) are at heightened risk of death and adverse outcomes relative to their nourished peers. There is a spectrum of risk that is influenced by context-specific factors for a variable and undefined proportion of these children, as is the case for children on the more severe end of the spectrum; co-morbidity is a common and critical contributor to risk across contexts but is not the only one. Food security affects but does not guarantee protection from adverse outcomes.

UN mandates and ways of working to deliver acute malnutrition care

Institutional (UN agency) arrangements around SAM and MAM treatment are a key determinant of realising a CoC. To improve our understanding of UN commitments, roles and responsibilities, we reviewed 20 available relevant UNICEF, WHO, UNHCR and WFP memoranda of understanding (MoUs), letters of understanding (LoUs), policy, strategy and guidance documents (1997-2017).

Global MoUs and strategies that refer to ways of UN agencies working together on acute malnutrition care reflect longstanding ways of working. Most formalised arrangements were last updated around 2011/12 and, with a few exceptions, have not been updated (see Box 1). Broader agency nutrition policies and strategies have seen more recent development and further updates are in progress (see Box 2).

Our review reflects a clear division of labour in terms of responsibility for SAM treatment (UNICEF) and MAM treatment, mainly in the form of TSFPs. While UNICEF Core Commitments for Children in Humanitarian Action (CCCs) (UNICEF, 2010) commit to acute malnutrition and collaboration with WFP regarding MAM treatment, in practice this has translated into full delegation of MAM treatment responsibility to WFP and a primary focus by UNICEF on SAM. This is reflected in both working arrangements and reaffirmed in recent UNICEF and WFP policies. WFP's declared mandate and programme approach on MAM in 2012 was based on longstanding experience in delivering SFPs in humanitarian contexts. Consequently, UN supported approaches to MAM treatment became generally equated with TSFPs.

Among all these arrangements and policies, there is a notable gap in understanding which agency is responsible for case management of complicated acute malnutrition. Working arrangements between WHO and other agencies are not formalised in global MoUs; in some situations, country-level agreements have been developed to govern working arrangements. A lead operational role for WHO in complicated case management for SAM cases is, in principle, understood and referred to in general terms in various documents, such as "supporting integration of SAM treatment into health systems" and "assisting governments to adopt SAM treatment protocols". However, this is not clearly defined and, in many instances, not realised. While UNICEF has prioritised and invested in SAM treatment and scale-up, this centres on uncomplicated case management. Both UNICEF and WHO describe their role in complicated SAM management as 'gap filling'; UNICEF steps in where WHO lacks operational capacity, with WHO stepping up to this role when and where it can (e.g. Yemen, Central Africa Republic, Ethiopia and South Sudan), but recognising a lack of country-level capacity in this regard. Given the division of institutional responsibility along SAM/MAM lines, it is also not clear where complicated MAM cases fall within the various UN remits.

More broadly, the operational role of WHO in case management of acute malnutrition remains unclear in practical terms and needs clarification. Support to scale-up of essential nutrition actions, including malnutrition treatment, is highlighted in WHO's current nutrition strategy, but operational implications are not articulated; WHO's remit around normative guidance development and uptake is more clearly articulated and understood. However, many stakeholders argue the need for WHO to demonstrate stronger technical leadership. Through this special issue we have found considerable variation in treatment protocols for SAM. This is an example of an area where WHO must assume a more active oversight of normative guidance uptake at country level, i.e. adaptations, their rationale, the consequences for interpreting and comparing programme performance, and the implications for child outcomes.

All UN agencies assert a commitment to prevention of acute malnutrition or prevention of malnutrition and/or its treatment. What constitutes prevention is, however, poorly defined in UN policies. For example, UNICEF speaks of SAM treatment and prevention of malnutrition, but do not specify if treatment of MAM is considered as part of its preventive strategy. WFP seeks to prevent "all forms of malnutrition" and to treat MAM.

It is unclear how UN agency mandates and policies have and continue to be determined. Working arrangements are negotiated between UN agencies, sometimes behind closed UN doors. There is no overall operational framework for how the three (and sometimes four) UN agencies work together to provide a CoC for treatment of acute malnutrition; hence there are gaps, overlaps and lack of granularity on how to deliver programmes together and a lack of accountability on supporting such a provision of care. Securing a new way of working is critically important to provide a CoC for acutely malnourished children and warrants independent facilitation and brokerage of inter-UN arrangements informed by competencies, capacities and country presence.

Mapping of SAM and MAM services in East and West Africa

Data on SAM/MAM programme convergence is not centrally collated or available. To bring greater visibility, ENN undertook a basic mapping exercise on

Box 2 Inter-UN ways of working

UNICEF and WFP: A 2011 updated guidance on mutual areas of responsibility states clearly that WFP is responsible for the treatment and prevention of MAM and that UNICEF is responsible for the treatment of SAM. The guidance describes the complementarity of both agencies, collaboration, some task-sharing where one agency is unable to deliver a component, and joint programming in locations where both are present and active. While WFP is responsible for coordinating delivery of SFPs (except in situations where UNICEF is better placed to do so) and for supplies, it is recommended that joint guidelines are developed to include responsibilities where one agency is absent and SFPs are necessary. UNICEF is responsible for therapeutic programme supplies and to support staff training on 'severe undernutrition'. WFP should provide food for the 'recovery phase' of Theraeutic feeding Programmes (TFPs), and food for TFPs more generally if UNICEF is unable to do so. A new UNICEF and WFP MoU has been under discussion by the two agencies since 2013 (Shoham and Dolan, 2013), but has not yet been released.

WHO and UNICEF: There is currently no written or formalised arrangement between WHO and UNICEF for the treatment of acute malnutrition. WHO's role is described in a UNICEF 2015 document on the 'management of SAM' (see Box 2). Here it describes collaboration with WHO 'to support integration of SAM management into health systems and to assist governments in adopting SAM treatment protocols'. However, there is no specificity on ways of working. A global MoU between UNICEF and WHO has been an ambition since 2013 (Shoham and Dolan, 2013), reaffirmed in Global Nutrition and Health Cluster discussions in 2016 based on a working letter of understanding (LoU) from Pakistan. However, this has not been produced. Key informant interviews with UNICEF and WHO staff) suggest that, in principle, WHO governs the area of inpatient care of complicated SAM.

UNHCR: UNHCR has mandated overall responsibility for treatment and prevention of wasting among refugees and internally displaced populations (IDPs) affecting >5,000. MoUs and LoUs outline arrangements with UNICEF, WFP and WHO to deliver assistance to those under UNHCR protection.

The 2011 MoU between **UNHCR** and **WFP** states that WFP will meet all food needs of refugees and IDPs in order to restore and or maintain sound nutrition status, but that UNHCR is responsible for determining nutrition status of refugees and for implementing selective feeding programmes as necessary. WFP is responsible for mobilising a range of food commodities for targeted and blanket supplementary feeding to address MAM, stunting and micronutrient deficiencies. When WFP is unable to provide these items, UNHCR in consultation with WFP will explore other possibilities for their provision until WFP is able to resume provision. WFP is also responsible ex ante for informing UNHCR of any pipeline issues.

The **UNHCR/UNICEF LoU (2015)** formalises bilateral cooperation between both agencies, with the annexed joint action plan articulating division of labour. The LoU outlines collaboration between both agencies to identify and treat SAM, explicitly referring to linking with other programmes to ensure the CoC for acute malnutrition, coordination to ensure screening and referral systems across the CoC of nutrition services that are provided, and support to integration of SAM treatment into health services. This document also recognises WHO as the global lead agency in health that sets norms, standards and guidelines that are used by UNICEF and UNHCR. UNICEF collaborates technically and programmatically with WHO on a wide range of health, HIV and nutrition issues, including SAM.

The existing MoU between UNHCR and WHO only mentions nutrition in respect to both agencies coordinating health and nutrition policies and WHO extending support with health and nutrition assessments. There is no mention of complicated acute malnutrition management. An update to the WHO/UNHCR MoU is in progress, but according to key informants this barely mentions nutrition.

UN-supported SAM and MAM treatment in selected countries in East and West Africa, using data sourced from UN regional and country offices. A summary with key recommendations is included in this issue (Brown R *et al*, 2019). UNICEF provided SAM data and WFP provided MAM data, which we used to examine the extent to which SAM and MAM treatment programmes supported by the UN agencies (essentially stabilisation centres (SCs), OTPs and TSFPs) are aligned. An online survey of country stakeholders provided further insights into programming. The mapping exercise had limitations; we did not investigate other MAM programmes that may exist at country level or approach governments directly for data; the online survey is not representative; we had limited time to contextualise findings and for busy regional and country teams to source and compile data. Bearing these in mind, we have important observations.

First and foremost, we found significant gaps in availability, consistency and comparability of UN-sourced data to help understand the extent to which a CoC for children with acute malnutrition is being achieved. Available data (national/sub-national/district) varied between regions and countries, between SAM and MAM, and between/within agencies. Different and problematic methods are used to calculate geographical coverage and treatment coverage. We could not determine service crossover at facility level, the degree to which services located in the same geographical region were linked operationally, and successful referral rates between services. Complicated case management particularly lacked visibility. A clearer picture of programme coherence was presented when one country level authority/agency had oversight and collated data or mapped service provision; e.g. Kenya (led by government), South Sudan and Somalia (Nutrition Cluster) and UNHCR programmes (East Africa). However, in general, no one UN agency has mandated responsibility for data continuity and monitoring of treatment for acute malnutrition.

Overall, we found SAM treatment without MAM treatment (TSFPs) is common. This reflects differences in UN strategies for the implementation of these two services. TSFP implementation is prioritised for areas/populations of highest vulnerability according to several criteria, including global acute malnutrition (GAM) rate of greater than 10%, and may be seasonal. Treatment for SAM aims for long-term 100% coverage integrated within existing health services. In this operational reality, geographical mismatch and lower MAM coverage are understandable. However, we could not determine the extent to which TSFPs are not present in settings where they should be and the degree to which commonly reported resource shortfalls were the determining factor. This approach implies that there is no UN ambition for 100% MAM coverage; both policy and practice reflect that UN supported MAM treatment is only warranted in certain circumstances, while SAM treatment should always be available. Given that children who are moderately malnourished are at increased risk of death, we challenge this position.

These observations support the need for an urgent strengthening of the evidence base and broadening of the scope in care options for MAM children across humanitarian and development contexts. Arguably, TSFPs are the best-evidenced MAM intervention and may be another reason why they are the 'go-to' option in many contexts. A 2007 retrospective analysis of emergency TSFPs by ENN and Save the Children has been cited as evidence of poor SFP effectiveness (for example, GNC, 2017[9]), which mispresents the findings. Examining data from 82 programmes implemented by 16 agencies in Africa and Asia, the analysis found that, out of 365,179 children treated, 260,034 recovered (69%); 67,366 defaulted (17.9%); 1,763 died (0.46%); and 47,016 (12.5%) were classified as non-responders to treatment. Most of the recovery-rate variation was due to defaulting. Nearly three quarters (73.8%) of programmes had a recovery rate equal to or above 75%, the standard set by SPHERE. Among the conclusions of the study was that TSFPs can be expected to reduce the incidence of SAM; it also noted that, where high defaulting is expected, alternative options may be more appropriate.

As a priority, we need to improve transparency on the degree to which a continuum of care is being provided to children with acute malnutrition, to learn from contexts where this is being achieved and identify where we need to act where there is no such

Box 3 Relevant UN agency policies

WFP: The 2012 WFP nutrition policy identifies prevention of acute malnutrition as a major focus area for WFP and states that WFP is the lead UN agency responsible for addressing MAM. It states that WFP is responsible for the treatment and prevention of MAM, and UNICEF for the treatment of SAM. The policy stipulates that WFP will deliver MAM programmes (TSFPs) in areas with global acute malnutrition (GAM) > 10% or 5-9% where there are exacerbating factors and that, in these areas, all eligible children and pregnant and lactating women should have access to MAM treatment, especially through CMAM programmes.

WFP's 2017 Nutrition Policy expands its remit to cover prevention of all forms of malnutrition, including both undernutrition and overweight/obesity, while reaffirming WFP's support to treatment of MAM, which it considers a critical part of the CoC. While working arrangements between UNICEF and WFP are configured around WFP delivering TSFPs for MAM treatment (see Box 1), this policy reflects a much wider programming remit around treatment and prevention and longer-term, in-country commitment by WFP beyond acute emergency contexts. WFP nutrition policy will be operationalised in country strategic plans or interim country strategic plans in support of national nutrition targets and/or emergency nutrition needs and aligned with national priorities and goals. Programmes, including MAM treatment, will depend on the context. WFP will seek to co-locate or integrate programme activities with other interventions to enhance nutrition-sensitivity and use existing platforms, such as social protection schemes, to maximise reach and support scale. WFP asserts a role in building demand for MAM services and will work with governments and partners, including UNICEF, UNHCR and its own cooperating partners, to treat MAM where needed and maintain the CoC.

UNICEF: UNICEF commits to ensuring that children and women with acute malnutrition access appropriate management services (Commitment 4, UNICEF CCC to children in humanitarian action, (UNICEF 2010)); benchmarks include both therapeutic and supplementary feeding targets. Programme action specifies collaboration with WFP for appropriate MAM treatment and support to existing capacity for management of SAM for children at community and facility levels. A subsequent UNICEF document from 2015, 'Management of SAM in children, working towards results at scale', reflects the focus of UNICEF on SAM. Reference is made to WHO (see Box 1). No specific mention is made of responsibilities regarding complicated SAM. The UNICEF 2014-2017 Strategic Plan states that UNICEF will continue to support delivery of community-based prevention and management of malnutrition. Emphasis is placed on the scale-up and integration of management of SAM. UNICEF's CCC and strategic plan are currently under revision.

WHO: WHO's first nutrition strategy, Ambition and Action in Nutrition 2016-2025, priorities include improving the availability of nutrition actions in health systems and scale-up of nutrition actions as part of efforts to achieve Universal Health Coverage (UHC) 2030 targets. WHO's delivery model for nutrition is framed around leadership, guidance and monitoring at global, regional and country levels. Within WHO, nutrition is a specific programme area within the non-communicable disease category. WHO commits to supporting scale-up of effective nutrition actions that include management of malnutrition and involves advocacy and guidance to organisational teams, strengthening linkages between programmes, ensuring nutrition actions are integrated within WHO essential care practices guides (such as Integrated Management of Childhood Illness (IMCI)), health workforce training, and improving the availability of therapeutic nutrition products (including RUTF) by inclusion in the essential medicines list (EML) and prequalification of manufacturers. WHO will provide direct technical assistance and convene partnerships for the collection, analysis and reporting of data. The strategy recognises the need for WHO to strengthen its nutrition capacities across the organisation at all levels.

The WHO 13th General programme of work (2019-2023) states that the WHO Secretariat will work with national authorities and partners to ensure that essential life-saving health services, including nutrition, are delivered, but no specific reference is made to malnutrition treatment. Within health emergencies, only breastfeeding support is specified. More programme specificity is reflected in a WHO article published in Field Exchange (Prinzo et al, 2017). This states that WHO's role in supporting integration of nutrition within UHC involves systematic identification, referral and treatment of acutely malnourished cases and urgently attending to SAM children with severe complications. Nutrition interventions to prevent and treat acute malnutrition are part of the WHO essential health package in emergencies. WHO helps ensure that key nutrition interventions are conducted in health facilities, including inpatient management of SAM, and that referral is made to other nutrition interventions (e.g. outpatient SAM, SFPs for MAM). It also states that WHO should monitor and evaluate inpatient management of SAM in health facilities, integrated within existing systems.

[9] Opening lines, p1: "A review of targeted supplementary feeding programmes in emergencies found that there was very limited data on the effectiveness of these programmes".

[10] David Milliband, President and CEO of IRC, Keynote speech at World Innovation Summit for Health, Doha, November 2018. www.rescue.org/press-release/speech-rt-hon-david-miliband-president-and-ceo-international-rescue-committee-world

provision. The findings of this mapping are further evidence on why we need to change our current ways of working. Most immediately and for as long as treatment is implemented through MAM and SAM specific programming, our findings point to an urgent need for a more in-depth, comprehensive and contextualised global review of MAM and SAM treatment services - their alignment and availability at national and sub-national level, how this is captured, or could be, in national, regional and global tracking mechanisms/platforms, and how (looking ahead) systems need to develop to capture evolution or revolution in care. Critically, we need to determine which UN agency is responsible for such oversight and which UN agency or agencies should support government capacity and, as necessary, delivery of contextualised support to all acutely malnourished children.


John Muksia

A Project Peanut Butter nurse explains the study to a mother with her MAM child at one of the Hi-MAM study clinics in Pujehun, Sierra Leone, 2018

An evolving programme landscape for treatment of acute malnutrition

Simplified/expanded/combined approaches for acute malnutrition care

Simplified/expanded/combined (hereon referred to as simplified) approaches to acute malnutrition treatment are not a new development but are getting more attention and traction, fuelled by the culmination of several important research studies in 2019 and high-profile advocacy[10]. Their development has been driven by challenges with current institutional arrangements to deliver a CoC, the need to simplify protocols to improve SAM scale-up within health systems, to fill a gap in treatment available to MAM children and ambitions to drive down costs. There is no single simplified/expanded/combined protocol or approach but rather a burgeoning mixture of research protocols and programme approaches.

MSF has adopted context-specific simplified approaches for many years in response to challenging conditions of access and need in humanitarian crisis (Hanson, 2019) and, since 2014, these approaches have been sanctioned by the GNC for exceptional circumstances (GNC, 2017) when either UNICEF or WFP cannot deliver SAM/MAM services (Aburmishan *et al*, 2019; Ntambi *et al*, 2019). An overview by UNICEF West and Central Africa Regional Office (WCARO) reflects a range of options being researched or programmed in the Sahel region (Woodhead *et al*, 2019) that include family MUAC (using caregivers to screen for acute malnutrition), reducing dosage of RUTF as SAM children move through the MAM phase of recovery, MUAC-only admission and MUAC-based (COMPAS) or MUAC- and weight-based (ALIMA) RUTF prescription. For some, MUAC-only programming is recommended where WHZ is not feasible; for others it is considered as the default option for all programming. The latter is (again) raising concerns regarding the implications of excluding children with low WHZ (Mohmand, 2019). Simplification to facilitate integration of SAM treatment into Integrated Community Case Management (iCCM) (Charle-Cuellar, 2019) or delivery of treatment by low-literacy workers (Kozuki N *et al*, 2019 [1]) is also under active research.

Some simplifications are relatively well evidenced and are consistent with WHO guidance on SAM treatment (e.g. family MUAC to improve community screening coverage); others are at a much earlier stage (of evidencing) and involve guidance departure (e.g. reduced RUTF dosage through the course of SAM treatment). We identified different visions and ambitions for these approaches amongst proponents, such as reducing RUTF costs, streamlining services, increasing treatment coverage for SAM children, and providing care for MAM children. Some consider combining SAM and MAM treatment as a short-term option in select contexts; others consider this the way forward for all settings.

Research will be published through 2019; headline findings are included in this special issue, where possible. Most research involves small-scale pilots, with more planned through 2019 and 2020. Preliminary findings from pending trials look promising but are mixed: the COMPAS trial found evidence of non-inferiority with MUAC-only admission and reducing dosage of RUTF through treatment, but default is considerable. However, preliminary findings of the MANGO trial by ACF[11] and ALIMA OPTIMA[12] trial have found less favourable outcomes among the sickest, youngest or poorest children.[13] Barriers to uptake of simplified approaches amongst country stakeholders in a four-country review (Kozuki *et al*, 2019 [2]) included concern about costs and caseloads, impact on SAM case management in health facilities, and confusion exacerbated by a lack of WHO guidance.

There is currently no formal responsibility for coordination of this growing research portfolio or oversight of the emerging evidence base and the implications for policy and programming; different agencies and, to a degree, donors (by funding), are setting the agendas. Scale and sustainability, including implications for health-system capacity and supply chains, have not been examined. A recent joint UN communique regarding simplified approaches, emerging from a WHO-hosted inter-UN meeting to take stock of emerging evidence, identified a lead role for WHO in evidence review and guidance development in this area (WHO *et al*, 2019). Such WHO engagement must translate into active technical leadership at regional and country level. Without this there is a substantial risk of inconsistency, unmanaged policy uptake and rollout of approaches that have not been thoroughly appraised.

UN agency perspectives on CoC

ENN conducted a series of interviews with WFP, UNICEF, WHO, UNHCR and the GNC to explore their vision and experiences of provision of a CoC for acute malnutrition. All agencies asserted that provision of a CoC must include activities directed towards the prevention of wasting, and that wasting cannot be separated from other forms of undernutrition, including stunting and micronutrient deficiencies. All also articulated a 'child-centred' narrative around growth and weight faltering, rather than just wasting or stunting. Integration of treatment and prevention services for acute malnutrition into health systems in conjunction with health-systems strengthening is also a critical part of the UN agency vision and discourse around CoC. Each agency described how this more holistic approach translates into 'tangible' programme activities. For example, WFP now introduces blanket supplementary feeding programmes (BSFPs) in emergency and country programmes alongside, and in some cases instead, of TSFPs (Ngwenyi *et al*, 2019). UNICEF invests substantial resources into health-system strengthening (HSS) and the integration of wasting treatment into these systems, while actively supporting infant and young child feeding (IYCF). WHO, for its part, is invested in an HSS approach for the treatment of complicated SAM. UNHCR approaches treatment of wasting from a 'health care perspective', working across sectors including health, water, sanitation and hygiene (WASH) and protection, and always endeavouring to integrate treatment within national health systems.

While presenting a comprehensive – and, indeed, a unified UN vision for a CoC approach to undernutrition – in practice we have found that achieving such continuity for the acute malnutrition treatment element of the continuum is hampered by multiple factors. These include the division of institutional responsibilities across the continuum of acute malnutrition (as currently defined using SAM and MAM); different agency-specific programme approaches, including targeting; lack of information continuity for referrals between services; major gaps in guidance and programming for care for children with moderate risk; resource constraints for scale-up of treatment; capacity challenge of health systems to integrate all acutely malnourished children; and significant RUTF/ready-to-use supplementary food (RUSF) supply shortfalls. We examine these factors in turn.

Institutional challenges around CoC for MAM and SAM children

One critical juncture in CoC for acute malnutrition is between community-based SAM and MAM services. Institutional separation of responsibilities between UNICEF and WFP (see policy section above) create challenges, arising from ways of working as well as agency-specific constraints.

[11] Presented at the Innovations in the Treatment of Acute Malnutrition: From Evidence to Action Meeting hosted by Action Against Hunger on behalf of the No Wasted Lives Coalition. London. 3 June 2019.

[12] ibid

[13] Personal comms and presented at the Innovations in the Treatment of Acute Malnutrition: From Evidence to Action. Meeting hosted by Action Against Hunger on behalf of the No Wasted Lives Coalition. London. 3 June 2019.

One major difficulty is co-location. Data compiled in the SAM/MAM mapping exercise (see above) and reflected in field articles and research suggest that co-location of OTPs and TSFPs is not common. This is understandable given that, in most cases, WFP and UNICEF use different targeting criteria to programme MAM and SAM respectively. WFP programme TSPs where GAM >10% or 5-9% with exacerbating factors (mainly food security related); UNICEF aims for 100% SAM treatment coverage where rates of GAM are high and health services are present. SAM services are available throughout the year, while TSFPs may only be delivered for part of the year during vulnerable periods. Also, while WFP/UNCEF MoU commit to working together where both are present/active; this is different to committing to always being present together (see policy section). UNICEF typically has longstanding presence in countries enabling a health-system integration approach, while WFP may not, so that MAM treatment in the form of TSFPs requires new and often parallel systems or may be absent where WFP is not present and/or no treatment is provided for in national policy. WFP and UNICEF may also have different implementing partners working in different catchment areas of the same district. Securing one partner for delivery of both SAM and MAM services is practiced – most commonly in refugee settings – but can be administratively complex. Pipeline breaks and supply challenges for RUTF (UNICEF) and ready-to-use supplementary food (RUSF) (WFP) are also a critical constraint affecting both agencies in different ways and at different times (see below).

A second critical juncture for CoC for acute malnutrition is between community-based management for uncomplicated cases and inpatient services for complicated cases. Complicated SAM data are captured and integrated within UNICEF-compiled country SAM data for global presentation (Nutridash) but are not distinguished in reports. WHO could not provide us with global-level geographic or admissions data for children with complicated acute malnutrition; while data may exist, it would require country-by-country investigation and compilation and is not harmonised. Similarly, there are no compiled data on the numbers of complicated cases referred between community and inpatient services or on direct admissions of complicated cases. Interpreting any available data in terms of coverage is complex, given the lack of (and challenges to generate) estimates of the burden of complicated acute malnutrition.

Apart from TSFPs, many other types of support may be offered to families of moderately malnourished children, such as nutrition counselling or household targeted support; e.g. social protection and livelihood support (Brown R *et al*, 2019). These services may be supported or provided by UN and/or civil society organisations and government and will be context specific. Very little information is available on the nature and caseload coverage of such support and the degree to which they are meeting the needs of these children. This partly reflects a lack of clarity regarding whose responsibility it is to ensure and track this provision, as well as the multiple agencies who may be involved in implementing this provision across humanitarian and development settings. Data may be available or collatable at country level but is not currently presented at global level.

At an institutional level, UNICEF and WFP have made considerable headway in several countries to strengthen continuity of care by working closely together. A good example comes from South Sudan where, overseen by the Nutrition Cluster, UNICEF and WFP have aligned targeting, achieving good coverage and a high level of geographical convergence (Aburmishan *et al* (2019). The Nutrition Cluster, which is charged with effecting improved coordination among actors involved in emergency response programming, has strengthened CoC for acute malnutrition in other countries, too. In Somalia, for example, the Nutrition Cluster has encouraged single partners to implement the range of treatment programmes for acute malnutrition or co-location among different implementing partners (Ntambi *et al*, 2019). Continuity is also facilitated by the cluster collating and sharing mapping data and initiating expanded protocols for combined SAM and MAM treatment in Somalia and South Sudan, delivered in both instances by UNICEF.

Attempts to address many of the constraints around TSFP delivery are reflected in recent innovations, where WFP has developed new strategies and programme modalities with government to improve reach and scale of MAM treatment, integrating MAM case management within BSFP in Cameroon (Ngwenyi *et al*, 2019) with a similar approach under pilot in northeast Nigeria. In Cameroon the BSFP is also used as a platform to access and refer to and from other services, including SAM treatment, and thus support continuity of care; this is also a good example of UNICEF and WFP coordinating and co-planning together. In India political commitment and flagship programming is looking to support an integrated approach to prevent and treat wasting, with ambitions for continuity of care from pre-pregnancy through to a child's second birthday, leveraging existing nutrition and health platforms and services (de Wagt *et al*, 2019).

Continuity of acute malnutrition treatment is also a strong feature of refugee programmes overseen by UNHCR. UNHCR has clear overall responsibility and duty of care for those under its protection, coordinates with and between WHO, UNICEF and WFP for service provision, and aims to secure one implementing partner across all treatment services wherever possible. However, UNHCR may have to contend with numerous institutional and resource challenges to enable a CoC (Mohmand, 2019). Significant shortfalls in providing a CoC for acute malnutrition characterised the early response to the Rohingya crisis in Bangladesh in 2017.[14]

Continuity of care appears most successful where there is coordination by one body/agency over data management and service provision (whether government or UN) and buy-in to this authority, where WFP/UNICEF undertake joint assessments and planning, and where one implementing partner provides SAM and MAM treatment services.

Confusion and ambiguity around the care of moderately malnourished children

Children classified as 'MAM' are a heterogenous group; they include those who transition through a moderate phase while recovering from SAM, those who present with MAM as a primary condition, those with complications, and those with concurrent anthropometric or other nutritional deficits (e.g. concurrent stunting, anaemia).

We have found substantial variation in how children recovering from SAM are managed in programmes. According to WHO 2013 guidelines, SAM children should be treated until full recovery (WHZ ≥-2 or MUAC ≥125mm, no oedema, depending on entry criteria). Furthermore, while not specified in WHO guidance, 'good practice' among some programmers is understood to be that, where available, recovered SAM children should be referred to TSFP, with a further eight weeks of supplementary feeding provision (a protection ration). What we have found from the SAM/MAM mapping exercise (Brown *et al*, 2019) and from articles in this edition (Kozuki *et al*, 2019 [3]; Guesdon and Roberfroid, 2019) is that an unknown proportion of children are discharged from OTPs once they reach the anthropometrically-defined moderate phase of recovery (WHZ ≥-3 or MUAC ≥110). Sometimes existence of a TSFP may prompt this adaptation; other times such adaptations are made by agencies to align with national guidelines. While MAM treatment in an OTP is implicit in WHO's interpretation of its guidance (personal comms), the guideline itself does not specify this. A WHO manual to support implementation of the 2013 guidelines should have more operational specificity but remains in the final stages of a very long development period. There is lack of evidence on the implications of completing SAM treatment through a TSFP in terms of continuity, intensity and quality of care.

Children who present with MAM as a primary condition at OTPs may or may not be treated or cared for, depending on the availability of TSFPs, OTPs with simplified protocols, nutrition counselling, BSFP that include MAM treatment, expanded general ration, livelihood programming, social protection, etc. Such provision may be reactive rather than proactive, determined by what happens to be available rather than by design. For example, ACF describes how lack of available MAM treatment (RUSF supplies/health-service capacity) led to community health workers expanding their remit from SAM to MAM, promoting breastfeeding, dietary diversification and two-week follow-up for MAM cases (Charle-Cuellar *et al* (2019).

As outlined earlier, variation and lack of clarity regarding MAM case management at least partly reflects a longstanding gap in comprehensive guidance on MAM. WHO guidance for MAM is limited to a technical note on supplementary foods for the management of MAM in children (2012) and essential nutrition actions (2013) and there is no WHO guidance on complicated MAM management. WHO recognise that guidance is not adequate for preventing and managing the global MAM burden; development of guidance is hampered by a weak evidence base.[15] As it stands, TSFPs are actually the most evidenced approach we have (see above).

The MAM guideline vacuum has prompted agency-led 'stop gap' guidance development. For example, variation in and lack of clarity on approaches to treat MAM in emergencies prompted the WFP-led MAM Taskforce to produce the MAM decision tool for emergencies (GNC, 2017) This remains the main 'go-to' guidance for many programmers. National guidelines on MAM exist in most countries surveyed in the SAM/MAM mapping but their basis, in the absence of WHO global guidance, is not clear. In countries like Nigeria there is no national guidance on MAM, which has hampered service provision in the recent emergency response (Hanson K, 2019). This gap has also created discord; a WHO MAM-related recom-

[14] Experiences presented at the Global Nutrition Cluster meeting, 2017. Presentation (Bangladesh Continuum of Care) available at: http://nutritioncluster.net/what-we-do/events/ and will feature in an online Field Exchange article later in 2019.

[15] WHO Paris MAM research 'ideation' meeting,10-12 October 2017


Benoit Fick/MSF

Therapeutic Feeding Centre in Gwange, Borno State, Nigeria, 2016

mendation (that providing supplementary foods to moderately wasted infants and children presenting to primary health-care facilities is not recommended) included in an update on the integrated management of childhood illness (IMCI) guidance to prevent overweight and obesity generated a subsequent open letter of concerned researchers and programmers; a rapidly convened meeting and joint UN clarification followed.[16] This helped catalyse a 2017 research consultation by WHO to formulate a research plan on MAM to address the evidence gap on individual characteristics of MAM children, the efficacy of interventions, and the package of care needed for full recovery. However, the multi-country randomised control trial proposal that was subsequently developed remains unfunded (personal comms).

These gaps in knowledge are critical as the nutrition sector grapples with the tension between scale-up of SAM services (currently still only at around 27%[17]), care of more moderately malnourished children (and other lower risk categories of undernutrition), and prevention programming in the face of limited resources. Experience and existing evidence suggest the consequences of failure to comprehensively address those at more moderate risk, particularly in hostile environments (infectious disease, food insecurity) include excess morbidity and mortality, risk of deterioration into SAM or development of complications (serious illness), and more anthropometric deficit (concurrently wasted and stunted, underweight), as well as unknown developmental and functional outcomes. A 2010 WHO, UNICEF, WFP and UNHCR consultation on the programmatic aspects of MAM identified many gaps that remain outstanding some nine years later (WHO *et al*, 2010). We think there are good mortality and economic risk arguments to give concerted attention to evidencing and delivering care packages constituting a range of options by context for those children at the moderate end of the spectrum. This should complement rather than compete with the ongoing effort to scale up accessible quality treatment to those children most at risk (identified as SAM).

Health-system capacity and health-system strengthening

The degree to which national health systems can accommodate acute malnutrition treatment is a key factor in determining continuity of care. UNICEF has made enormous strides in supporting HSS and integrating SAM treatment into health systems over the past 12-15 years, with an estimated 4.4 million SAM children (2017 data) being treated[18] and ambitions to reach 6 million children by 2021. However, coverage of SAM treatment remains stubbornly low. With regard to children categorised as MAM, other than global estimates of burden and numbers treated, there are no equivalent global projections and ambitions for its management in whatever form that might take. Approaches to simplifying protocols for treatment of SAM for health facility and community worker delivery are with a view to facilitating the scale-up of SAM and, for many, moderate cases too. However, while streamlining and easing case management for frontline staff (Marron *et al*, 2019), caseload will increase, particularly if direct admissions of moderate cases take place. Some fear that accommodating a broader spectrum of children at risk will compromise the care of the most severe (and most at risk), spreading capacity even more thinly than is currently the case. In such circumstance, a critical consideration will be the ability of governments to resource treatment to accommodate a 'moderate' caseload two to four times greater than the current SAM caseload. As reflected in the UNICEF WCARO review of initiatives in West and Central Africa engagement with government and context-specific research and adaptation is essential to examine consequences for service quality and scale (Woodhead S *et al*, 2019). Prioritising 'moderate' children who need health facility-level management; i.e. higher risk cases, makes practical as well as clinical sense; how to identify these children is, as we have outlined earlier, an area of increased research and programming innovation. Determining the implications of current proposed approaches in terms of cost, capacity and sustainability for health systems in different contexts, particularly those seeking to accommodate a wider spectrum of at risk children within health services, is critical. It is essential that WHO engage in this at country and regional level, as well as global authority.

Continuity of RUTF and RUSF supplies

In compiling this edition we have identified significant shortfalls in RUTF and RUSF supply that are compromising care. Half of surveyed stakeholders in our SAM/MAM mapping in East and West Africa reported problems with the RUTF/RUSF supply chain (Brown *et al*, 2019). RUSF pipeline integrity has threatened research studies (Pilar Charle-Cuellar *et al* (2019); IRC work in South Sudan). UNHCR contingency planning for shortfalls has been necessary to meet needs in East Africa but is unsustainable.

One international non-governmental organisation (INGO) that conducted a review of RUTF supplies found eight out of 12 of its country programmes experienced shortfalls in 2018, and seven expected shortfalls in 2019 (key informant interview). Factors contributing to this included limited availability of supplies, weak supply-chain management at multiple levels, poor communication between suppliers and facilities, lack of access due to insecurity, and inadequate reporting. Mitigation actions included purchase of stocks, redistributing supplies between facilities and borrowing and using alternative products. Preparation for anticipated stockouts included securing buffer stocks where possible (although donors are often not keen to fund this), transport support, and advocacy. A rapid assessment among another five INGOs active in CMAM programming in multiple countries found all experienced significant RUTF shortages in 2018. Stockout tracking by another INGO reported that, in one West African country, serious supply shortages were experienced in one-fifth (21%, ranging from 7 to 41%) of 22 Ministry of Health (MoH) facilities in 2018 (due to underestimated needs by UNICEF, delayed delivery and lack of a transport budget). Most agencies do not routinely gather data on stockouts; it has become 'the norm'. Facilities and INGOs are rarely alerted to impending stockouts.

UNICEF, as the lead RUTF supplier, has been working hard on supply-chain strengthening as part of HSS. UNICEF Supply Division (Copenhagen) report working on better systems for supply planning for RUTF at country and regional levels. Some regional initiatives are underway, e.g. a UNICEF West Africa tracking tool has been developed to help forecast gaps in supply and demand. This may evolve into a web-based tool modelled on that used to track vaccines.[19] In other countries, such as Burkina Faso, the addition of RUTF to country EML has enabled better supply-chain management by facilitating local RUTF production and access to development funding.[20] While RUTF is not included on the WHO's EML (WHO, 2019), 17 out of 38 countries tracked by UNICEF now include RUTF on national EML.

Problems with RUSF supply have also been reported by many agencies to ENN as even more widespread and unpredictable. RUTF and RUSF pipeline interruption is a significant, longstanding and complex problem involving many factors. Supply depends on government systems, international and domestic funding, health-system capacity and logistics. Challenges are increased in fragile, insecure settings. A critical gap is the lack of data on the extent and nature of RUTF and RUSF pipeline problems. We need to know the scale of this problem so that we can collectively determine how to solve it. We do not know how this is impacting quality of programming and child outcomes, such as increased default rates and slower recovery due to reduced supply. Success of new, simplified approaches will still depend on product supply. If we are struggling to deliver supplies to facilities, how will we manage to deliver at community health-worker level? As a critical first step we need transparency regarding supply-chain issues for both RUTF and RUSF in order to address this significant impediment to CoC for children.

Information continuity

Availability and continuity of information at multiple levels is instrumental to continuity of care (Dasgupta

[15] WHO Paris MAM research 'ideation' meeting,10-12 October 2017
[16] https://www.en-net.org/question/3251.aspx
[17] https://www.acutemalnutrition.org/en/countries
[18] https://acutemalnutrition.org/fr/countries
[19] ViVa (visibility for vaccines) www.vivaplatform.org/en/Footer/About-ViVa
[20] Lessons on integration of SAM treatment into health structures and services in Mali and Burkina Faso; to feature in Field Exchange 61.

R *et al*, 2018). At a global level, this gives visibility to need and service provision; at national and sub-national level it helps plan for delivery. Throughout our reflections we have highlighted many challenges around continuity and availability of harmonised data. Institutional divisions of labour and lack of clarity in areas of responsibility are reflected in siloed or absence of data. UNICEF's Nutridash platform compiles country-level data on treatment (e.g. burden, coverage, numbers treated) for SAM only.[21] WFP's global dashboard on acute malnutrition is specific to WFP response and reports on numbers assisted by country.[22] WHO's Global database on the Implementation of Nutrition Action (GINA) provides a repository of policies, actions and mechanisms related to nutrition, but does not collate data on acute malnutrition treatment.[23] While the NWL's goal and 2020 outcomes are for wasting, treatment coverage and target-tracking on the allied State of Acute Malnutrition platform is based on SAM indicators and SAM data (Nutridash) only.[24] No one agency has responsibility for continuity of information around acute malnutrition treatment and prevention, which limits collective and individual agency accountability.

Conclusions

We recognise the rapidly emerging new thinking around undernutrition and risk. How we describe, identify and categorise acute malnutrition and how we intervene may well change in the relatively near future. Our conclusions are prefaced on the understanding that with new emerging research, evolving programming and a developing 'new' narrative, it is feasible that programming will evolve away from assessment and care purely determined on whether a child is categorised as SAM or MAM. While research, programming and high level agency discourse is indicating such a direction of travel, wholescale change will require a significant rethink and reconfiguration of guidance and approaches at multiple levels; if it happens, it will take time. We continue to consider MAM and SAM children in this edition as this reflects how programming and guidance is currently organised and to highlight learning from the MAM and SAM experience over the past 40 years. It is our hope that any new risk profiling and programming approach that does emerge in the years to come, will learn from these lessons.

It is clear from the work contained in this special issue that there is considerable appetite for and some progress to improve CoC for children. However, this is not enough to address the overall poor CoC for acutely malnourished children reflected in the evidence amassed in this edition of *Field Exchange*. A key area needing change is current UN institutional arrangements around acute malnutrition care which translate into lack of programme coherence. As it stands, there appears to be no overall oversight and institutional responsibility for ensuring the care of all malnourished children in all contexts, and consequently, no comprehensive strategy to address this, no data system to track this and hence no accountability when provision is inadequate. Furthermore, there is no overall operational framework for how the UN agencies work together to provide a continuum of care for treatment of acute malnutrition. There are gaps, overlaps, and lack of granularity on how UN agencies deliver programmes together. Protracted UN efforts to progress at an institutional or operational level to address problems are not transparent and have not yet shown tangible progress. An updated UN joint statement on continuum of care has been postponed pending greater evidence on the effectiveness of new simplified approaches. Our view is that conflicted technical positions and institutional territoriality has, and will continue to, underpin the prevailing stalemate or may be reconfigured in new self-determined arrangements. We consider the UN system alone is unable to fix these 'institutional disconnects' from within but requires external oversight and help to do so.

Shortfalls in CoC is most stark for children at the moderate end of the spectrum of risk (primary MAM cases), but also extends to children who are recovering from SAM and are discharged early which may compromise care continuity and outcomes, and most likely to complicated cases too. While global narrative commits to increase treatment coverage to all acutely malnourished children – as reflected NWL 2020 targets, for example - in practice, there is no UN ambition for full coverage of all children at moderate risk, unlike for SAM children. This disparity raises questions of equity - is there an 'avoidable difference' in how we have approached the care of children, where attention to and therefore access to treatment is based on how a child is categorised (SAM v MAM)?[25] While provision of care for complicated case management appears more consistent for SAM cases than for MAM, for all these children there is a lack of clear agency operational responsibility for this highly vulnerable cohort of children and therefore poor visibility with respect to coverage and quality of service provision.

In practical terms, this means that an unknown proportion and number of acutely malnourished children – especially those categorised as 'moderate' - receive limited or no support. We therefore don't know what concerted action to support these children is needed, where, the costs of intervening and the price (financial and human capital) of not doing so. We know that some of these children will recover, others will remain 'moderate' and become stunted, others will progress to severe status. There are limited data on outcomes for these untreated moderate cases, but even very conservative estimates (10% progressing to SAM) would suggest that this untreated cohort could add at least 45% to the SAM caseload.[26] This is in a global context where, despite best efforts, we are still unable to reach and treat more than 27% of SAM children for a variety of complex reasons; e.g. cost, resources, pipeline breaks, weak health systems, conflict and access, etc.

The absence of global normative guidance (one of the areas where institutional responsibility is clear) that addresses complicated and uncomplicated MAM has significantly hampered CoC for acutely malnourished children. This has fuelled ad hoc national strategies, narrow programme options and poorly developed institutional architecture to support governments to deal with this vulnerable cohort of undernourished children across humanitarian and development settings. The need for WHO to 'step up' here to remedy this situation could not be clearer.
Reflecting on what we have observed, we feel compelled to recommend three urgent courses of simultaneous action:

First, one UN agency should be designated with overall responsibility for provision of CoC for acute malnutrition in all settings. This does not preclude operational and normative roles for other UN agencies, but does confer a unique authority, responsibility and accountability for the presiding UN agency. Competencies, capacity and resource should be defined for such a position. For example, this agency should have long-term presence in countries with burdens of acute malnutrition and work largely through the health system to facilitate integration as appropriate, as well as provide access points for preventive services, such as social protection and livelihoods support. This 'umbrella' UN agency must provide coherent and comprehensive data on CoC provision. This position should not be self-determined by UN agencies but involve some form of independent oversight or appraisal with transparent criteria and process. Similarly, inter-UN initiatives to address wasting, such as the Global Action Plan on Wasting currently being developed, should be subject to external multi-stakeholder and expert peer review. We should look to lessons from other sectors and how they do business. At the same time, urgent clarification is needed around UN agency operational and normative mandates and ways of working together to deliver acute malnutrition services.

Second, there is a need for a dedicated body of coordinated research into approaches to manage at risk infants and children, that includes those currently categorised as 'MAM', in both humanitarian and development settings across Asia and Africa. It should investigate different risk profiles of children and take account of national resources, health systems and household level interventions, such as livelihood and social protection programming. Research must include cost effectiveness studies and consider scalability and sustainability. This should culminate in normative guidance for the treatment and care of at-risk children that can be contextualised by governments and agencies and that includes cost and cost-effectiveness. In the meantime, interim rapid guidance is needed. Existing research plans, such as WHOs multi-country research plan on MAM, should be considered along with emerging research prioritisations, such as on prevention of wasting, and newer approaches to identify and manage at risk infants and children. More broadly, urgent WHO technical leadership and activism is needed on research, rapid/interim and longer-term guidance development (including simplified approaches and RUTF formulations), as well as guidance rollout and uptake at global, regional and country levels. How to quickly address WHOs recognised shortfalls in nutrition capacity to deliver on this, and alternative arrangements if necessary, needs urgent examination and action.

Third, an urgent review of the extent and nature of RUTF and RUSF supply issues is needed so that these can be collectively addressed.

As we go to print, there is considerable will and action being taken to reform wasting treatment at the highest levels. It is essential that we learn from our past mistakes with MAM and SAM programming – especially in relation to institutional architecture – in determining how continuity of care can be facilitated, supported and accounted for in the best interests of the child.

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[21] www.unicefnutridash.org
[22] WFP dashboard (internal)
[23] https://extranet.who.int/nutrition/gina/en
[24] https://acutemalnutrition.org/en/website-guide-data
[25] Equity is the absence of avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, geographically or by other means of stratification. https://www.who.int/topics/health_equity/en/
[26] This 'back of the envelope' calculation is based on the following understanding. At least 10% of untreated cases of MAM progress to SAM and a further 5% progress to being both wasted and stunted. See section on 'Are MAM children at risk' above.

Nutrition screening in Yamani refugee camp, Markazi, Djibouti, 2017

UNHCR/Naser Mohmand

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