

Simplified approaches to treat acute malnutrition: Insights and reflections from MSF and lessons from experiences in NE Nigeria



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Mothers and children awaiting consultation in a joint OPD/OTP clinic, Borno State, Nigeria, 2016

Background to MSF's use of simplified acute malnutrition programming

Médecins Sans Frontières/Doctors Without Borders (MSF) has been engaged in simplifying and streamlining the treatment of acute malnutrition dating back to before the creation of ready-to-use therapeutic food (RUTF), with the aim of improving both coverage and quality of care and the ultimate goal of decreasing mortality. Working in greatly differing contexts, including in acute and chronic humanitarian emergencies and urban and rural settings, has required MSF to develop interventions that fit challenging operational constraints and objectives.

Current barriers to increased coverage and quality of treatment for acute malnutrition include rigid and unrealistic national community-based management of acute malnutrition (CMAM) protocols and poor integration with primary and secondary healthcare programming and strategies. The classic CMAM approach is resource-intensive, often impractical for caregivers, and lacks the flexibility required to adapt to different needs and limitations, while also largely neglecting the continuum between health and nutrition.

Characteristics of MSF-Operational Centre Paris (OCP) nutrition operations

Numerous unique operational features of MSF-OCP allow and encourage the organisation to simplify and adapt its nutrition interventions to suit the varying contexts in which it operates. As an emergency medical organisation, the priority is to provide life-saving treatment, thereby decreasing mortality; preventive interventions are not excluded but are often secondary. The focus

of nutrition programmes is therefore treatment of severe acute malnutrition (SAM), including high-level hospital and medical care for the very ill, with the treatment of moderate acute malnutrition (MAM) implemented only in specific contexts, according to need and feasibility. Also related to its medical roots, the integration of healthcare and nutrition programming is the norm for MSF-OCP. Where MSF supports an outpatient therapeutic programme (OTP), there is generally a medical outpatient department (OPD), and alongside any stabilisation centre (SC) there is most often also a paediatric inpatient department (IPD), providing free access to healthcare for anyone in the target age group. This simultaneously decreases morbidity and mortality among patients without acute malnutrition and treats diseases that commonly lead to deterioration of nutrition status.

Another unique feature of MSF, due to its independent financing and functioning and logistics strength, is its flexibility to intervene rapidly before other nutrition partners are mobilised. MSF teams are, therefore, often among the first international responders in humanitarian emergencies. MSF chooses to work in operationally difficult and insecure contexts with limited access for both teams and beneficiaries; this requires flexible operational strategies that can suit realities on the ground. MSF responds in restricted geographic areas, targeting prioritised populations with focused interventions, often horizontal (integrated) in nature. This contrasts with United Nations (UN) agencies and other partners, who often implement large-scale (although generally vertical) nutrition programmes.

The complexity of horizontal and integrated programmes requires each component to be as

simple as possible; taking some of the complexity out of the nutrition programming allows room and resources for primary healthcare programming, for example. There is also need for rapid but phased responses allowing for immediate attention to those most at risk, followed by adaptation of the intervention as the context evolves, including availability of other actors. These features of MSF's way of working encourage the use of simplified and context-specific protocols for acute malnutrition treatment.

Rationale and considerations for simplifying acute malnutrition treatment

MSF has advocated for the simplification of acute malnutrition treatment approaches to enable nutrition programmes to improve access and quality of care, according to varying context-imposed operational needs and constraints. This has involved using mid-upper arm circumference (MUAC) as the sole anthropometric indicator for identifying children requiring nutritional treatment and monitoring progress during treatment; reduced frequency of follow-up in outpatient care; single programming for MAM and SAM; and simplified dosing of specialised nutritious food products (SNFPs). Context-specific adaptations which MSF advocates for also include context-appropriate use of antibiotics; context-appropriate choice of target population (with use, for example, of a sliding MUAC scale); and integration of nutrition screening and treatment with essential life-saving health interventions during blanket emergency strategies in contexts without functioning nutrition programmes (e.g., anthropometric screening and provision of RUTF during measles vaccination campaigns or seasonal malaria chemoprophylaxis).

Sole use of MUAC

Although the debate around the use of MUAC as a sole criterion for entry to programmes is ongoing, in practice MUAC enables rapid decentralised screening and identification of at-risk children. This has an important advantage for use in understaffed and overburdened health structures and enables decentralised care through community health workers and mothers. Benefits also include improved early detection.

Reduced frequency of follow-up

Standard CMAM programming requires weekly follow-up during outpatient SAM treatment. This is a heavy burden for both mothers and healthcare facilities. When access is limited, it can mean the difference between receiving treatment or not. Decreasing the frequency of visits when children are stable can significantly reduce the burden for caretakers and programmes. This is ideally accomplished through task-shifting of surveillance and monitoring to community health workers or mothers.

Joint SAM and MAM programming

Single programming for SAM and MAM, referred to as “expanded”, “extended” or “simplified” programming, offers treatment for both SAM and MAM in a collaborative effort with a common circuit and staff, and with use of a single SNFP. This approach has administrative and logistic advantages and allows for easier adaptation of the target population according to resources and needs as contexts evolve. This approach also enables a continuum of care for each child as they recover from acute malnutrition.

Context-driven adaptations

To truly optimise coverage of needs and quality of services, interventions must be simplified and adjusted according to context-specific needs and barriers. Whether to provide treatment for SAM and MAM jointly may, for example, depend on general MAM treatment strategy, whether faced with an acute emergency, expected caseload, available resources, expected catchment area, presence of contributory co-morbidities, and presence of other actors. In some contexts, for example, rather than including all of SAM and MAM, it may be more feasible and realistic to expand criteria to include only children with MUAC <120mm (MUAC sliding scale). Context should also be considered when deciding whether to use mothers or community healthcare workers for MUAC-based case-finding and follow-up between visits, and whether and how far to space outpatient visits.

Current CMAM protocols include systematic treatment with amoxicillin, in spite of lack of conclusive evidence for the benefits of this practice, growing antibiotic resistance and World Health Organization (WHO) recommendations to limit and rationalise antibiotic use. Providing broad-spectrum antibiotics systematically only when truly required would follow WHO recommendations and further simplify SAM treatment. While systematic treatment may be warranted in certain contexts, local factors such as prevalent co-morbidities, access to healthcare and resistance

patterns should be considered when choosing whether to provide blanket antibiotics during treatment of SAM (Trehan, 2013; Isanaka, 2016).

Many of these strategies are now being studied and implemented more widely. While positive results have been demonstrated, care must be taken not to upscale new strategies too hastily and, when implemented, new strategies must be monitored appropriately. MSF experiences demonstrate both advantages and drawbacks that should be considered. One of the most recent and significant experiences in using simplified and context-adapted protocols was during MSF-OCP's interventions in Borno, Nigeria in 2014–2015.

MSF experiences of simplified approaches to acute malnutrition treatment in north-eastern Nigeria

Context

MSF-OCP has maintained a permanent presence in Borno State, Nigeria, since 2014, providing healthcare to populations affected by the ongoing violence and population displacement in the region. Operations have varied over time, with activities in a number of different locations, over different durations, and in constant evolution. MSF has intervened in official and unofficial camps in and on the outskirts of Maiduguri (the state capital), as well as various other areas throughout the state, serving both displaced and host communities. Activities have included water, sanitation and hygiene (WASH) interventions, primary healthcare and nutrition (including OTPs) and secondary healthcare (including an SC for the treatment of SAM with complications), perinatal care, epidemiological surveillance and monitoring, response to outbreaks, and food and non-food item (NFI) distributions. Operations were, however, severely constrained as a result of multiple factors, including escalating violence, security problems and lack of access to populations in need. MSF had a difficult relationship with the Ministry of Health (MoH), including (among other issues) lack of access to land or structures for MSF to run activities. Although the International Committee of the Red Cross had an international presence in Maiduguri, in 2014–2016 there was minimal presence of any other international non-governmental organisations.

By June 2016 the conflict had displaced around 1,404,483 people in Borno State. Maiduguri was hugely overcrowded (with multiple informal camps/settlements and 11 official camps), with inadequate access to food, healthcare, shelter and sanitation. By June 2016 consultations in the two MSF-OCP supported OPDs in Maiduguri had increased to over 1,000/day and remained at that level until October of that year; 20% of children presenting were identified as having SAM. During the same period, OTPs at the same two sites were following 1,000–2,000 cases of malnourished children, and maternity units were assisting 120 simple deliveries and providing 1,200 antenatal clinic (ANC) consultations each week. After being forced by the MoH to leave the previous site, a new 30-bed SC was set up in the Maiduguri district of Gwange in May 2016. Despite expanding to 115 beds by July,

the centre continued to have a bed occupancy rate of over 100%. Half of the SC admissions were from the host population, who complained of high food prices and food unavailability.

In mid-June the Nigerian military, along with a local non-governmental organisation, organised the evacuation of 1,192 people requiring urgent medical care from Bama camp to Maiduguri. The camp was located around 70 kilometres south of Maiduguri, inside a former hospital compound with entry and exit controlled by the military. Of 466 children screened using MUAC measurements by MSF-OCP upon arrival in Maiduguri, 66% were wasted and 39% had SAM, raising an immediate alert. A first visit by an MSF-OCP team in June 2016 discovered a catastrophic humanitarian situation: 15,000 internally displaced persons (IDPs) were found living in terrible conditions, completely dependent on aid, with very high rates of SAM (20%) and high mortality due to malnutrition and malaria. A press release alerted the humanitarian community to the dire situation to mobilise action. Due to serious security concerns, MSF-OCP settled on monthly rapid emergency interventions rather than maintaining a permanent presence. A team was moved into Bama by United Nations Humanitarian Air Service helicopter for four days per month to implement a mass treatment package for health and malnutrition, including identification and treatment of SAM and MAM and targeted food distribution to families of all children under five years old, as well as health and WASH interventions. Malnutrition rates rapidly dropped to below emergency thresholds as a result. By October 2016 Bama had become a priority location for the state government and UN agencies, with regular food distributions by World Food Programme and UNICEF, and Nigerian Air Force-supported clinics. Given this scale-up, MSF-OCP decided to redirect its assistance to other more vulnerable areas.

Interventions

Maiduguri

In July 2016 MSF-OCP ran two OTP sites in Bolori and Maimusari and an SC in Gwange, all targeting care to children aged 1–59 months with SAM. In Bolori and Maimusari outpatient treatment was provided side-by-side with general OPD consultations for all-comers, as well as antenatal care (ANC) and maternity services. Admission and discharge criteria for the therapeutic feeding programme included standard indicators: both WFH- and MUAC-based anthropometric cut-offs and bilateral pitting oedema. Admissions to the SC came primarily from the two MSF-supported OTPs or via referrals from MSF activities in IDP camps on the outskirts of Maiduguri and elsewhere. In light of the critical situation, steps were taken to expand coverage, including the addition of an OTP at the site of the SC (increasing the number of OTPs to three), increased bed capacity of the SC, inclusion of treatment of children with MAM up to age 59 months and inclusion of treatment of children with SAM up to age 10 years. A second objective was to improve quality of care, particularly with regard to the critically ill children arriving at the SC, but also regarding the general continuum



MSF health worker screening for acute malnutrition with MUAC during OPD consultation, Borno State, Nigeria, 2016

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secondary care for non-SAM cases and secondary care for children with complicated SAM. MSF modified its strategy in response to these changing needs, eventually narrowing back down to the treatment of SAM in children up to age 59 months only. Complicated MAM cases were still managed by MSF, as were all other children under five years old, but now as general paediatric cases in the paediatric hospital.

There has not yet been any formal evaluation regarding use of the described adaptations in Borno, but internal reports show that programme outcomes remained within MSF thresholds and Sphere minimum standards throughout their use in 2016 and 2017.

Bama

The strategy in Bama differed from that in Maiduguri due to a different set of barriers. The objective in both locations was high coverage of care using a multidisciplinary approach. Although quality of services remained a constant goal, there was a particular emphasis in Bama on rapidity and comprehensiveness of services due to security constraints (to do as much as possible in a short time frame with punctual visits and with services that would continue to provide a benefit over time). The strategy included monthly rapid emergency interventions rather than maintaining a permanent presence on the ground. On each visit the team provided many services, including comprehensive MUAC-based nutrition screening of all children aged under 10 years (age estimated based on height), with systematic antibiotics and one-month supply of RUTF for all children with acute malnutrition (dosing based on whether SAM or MAM according to age-specific MUAC cut-offs), and targeted food distribution of millet/oil/beans to families of all children under five years of age. Simultaneous activities included outpatient consultations, seasonal malaria chemoprophylaxis, distribution of mosquito nets and NFIs, water and sanitation activities, and measles and pneumococcal vaccinations.

Challenges, lessons learned and questions raised

MUAC-only protocols

In Maiduguri the use of MUAC-only to identify SAM cases and monitor their progress was implemented principally as a means to simplify and speed up flow through the patient circuit by enabling a broader range of health workers to take anthropometric measurements and thereby ease overcrowded outpatient services. In this context of very high caseload of GAM and limited resources, this was the most feasible way to identify children with SAM at highest risk of death in need of additional support. Using a single anthropometric marker also facilitated expanding care to treatment of children with MAM, then scaling back down to SAM-only management.

OPD teams were satisfied with the approach, describing increased ease and speed of systematic and comprehensive screening of all children presenting for general consultations and improved efficiency during follow-up consultations. Overall, the MUAC-only approach allowed for manage-

ment of a larger caseload and improved allocation of valuable time and space for improving quality of care.

The principal implementation challenge was gaining approval from MoH and national-level UNICEF to depart from national protocols. There was also some disagreement around acceptable admission criteria between MSF and other implementing partners, most of whom used both MUAC and weight-for-height (WFH), particularly as it related to patients referred between non-MSF OTPs and the MSF-run SC. Finally, there were some concerns regarding cut-offs for children aged 5-10 years in light of minimal experience using MUAC-only programming in this age group.

In Bama, anthropometric screening was used to establish eligibility for provision of prompt essential treatment rather than inclusion into a more typical nutrition programme. MUAC was the only feasible option for rapid massive screening during a multidisciplinary intervention. The only concern, as in Maiduguri, was related to lack of experience with MUAC cut-offs for children older than 59 months.

Single circuit/single product programming for SAM and MAM

In light of the high prevalence of SAM with an underlying context of poor sanitation, lack of access to health care, and food insecurity, MSF decided to not only treat but also prevent deterioration into SAM. Preventive strategies included increasing general access to primary care and identification and treatment of MAM. As SAM programming and OPD services already existed but human and physical resources were limited, MAM treatment was integrated into the pre-existing SAM programme. SAM and MAM services used a single patient circuit, and the same staff and product (RUTF). The principal differences in care were RUTF dosage (children with MAM received half the dosage received by children with SAM) and treatment of complicated cases (complicated SAM cases were referred to the SC whilst complicated MAM cases were referred to the MSF IPD for standard paediatric care in accordance with MSF-OCP and national protocols thus shortening length of stay in hospital). Nutritional stabilisation for SAM cases in SCs, involving initial feeding with therapeutic milk followed by gradual reintroduction to solids and increased caloric content, generally takes 5-7 days. In standard paediatric care children are advanced to full feeds as soon as medically stable, with length of hospital stay averaging only 3 days. MAM children with complications were thus able to rapidly return to nutritional rehabilitation after medical treatment and not required to stay as long in the hospital.

Use of an expanded criteria protocol allowed MSF-OCP to adapt to the context by increasing coverage when required and to reduce the programme caseload when the situation evolved. Providing both SAM and MAM treatment through a single programme also enabled continuity of care for children recovering from SAM, allowing them to continue nutritional rehabilitation without transfer or admission to a separate MAM programme.

of care, through reinforced referral systems and improved emergency and critical care.

In order to allow for the large increase in activities in the context of immense operational constraints, a simplified approach was essential. MSF-OCP had initially used MUAC-only programming when activities were established in north-eastern Nigeria in 2014, but had to change to a combination of MUAC and WFH as required by the MoH and UNICEF in order to comply with national protocols. When the situation worsened in 2016, MUAC-only programming was reinstated alongside other methods to simplify, streamline and contextualise the response, including a simplified/MUAC-based dosing using a single product for SAM and MAM. Children were discharged once MUAC reached >125mm for two consecutive visits and after a minimum of four weeks in the programme. Improving patient flow, including the patient circuit and triage, was also a priority; particularly to facilitate flow between the OPD and OTP. There were clear advantages of having both activities side-by-side including more systematic screening and case-finding and a simpler continuum of care.

By adopting these modifications into the strategy, MSF-OCP was able to treat 11,911 cases of global acute malnutrition (GAM), including 2,121 cases of complicated SAM, in the period from July to December 2016 across its three OTPs and one SC.

By early to mid-2017 the situation had changed. Many other actors were involved in nutrition programming in the area, providing OTPs, a blanket supplementary feeding programme providing one ready-to-use supplementary food per day to all children under five, cash programming, and general food distributions. MSF had strengthened the referral system to and from the SC for cases treated at OTPs supported by other actors. The malaria and diarrhoea peaks had passed, but there was still a lack of access to primary and

In Bama, where limited access required a rapid intervention, screening for and treating SAM and MAM in a single process and with a single product allowed for efficient and rapid treatment and prevention of SAM. In addition, supply and distribution of only one product greatly simplified logistics.

The biggest challenge to this expanded criteria strategy was the sheer number of children admitted. A three-fold increase in caseload when the admission cut-off was increased from 115mm to 125mm is largely attributable to the increase in MAM caseload that accounted for 70% of admissions during 2016 (25% were SAM cases under 5 years of age; the remainder were SAM children aged 5-10 years). As part of the general project upscale, an IPD was opened to provide secondary care for children up to age 10. MSF-OCP was thus able to hospitalise complicated MAM cases in this facility, referring them to the therapeutic feeding programme on discharge. It would have been more complicated if children with both complicated SAM and MAM had required hospitalisation in the SC.

Medical case management for children with MAM in the context of the expanded protocol

MAM cases are, by definition, not as advanced in the disease process nor as high risk of illness and death as SAM cases. Expanding the criteria to include MAM and thereby provide the same intensity of care as for SAM may risk overtreating MAM, over-complicating MAM treatment and wasting resources. This may be most pertinent where it pertains to medical management and follow-up provided for MAM cases. Does MAM require the same intensity of care as SAM in terms of frequency of visits, stabilisation during hospitalisation for complicated cases, and routine antibiotics, for example? Although MSF-OCP and national protocols recommend hospitalisation of complicated MAM cases in a general paediatric IPD, this is not universal. Some protocols do not specify where to hospitalise cases and others recommend hospitalising cases in SCs, alongside SAM cases. Although routine antibiotic administration is not practised in supplementary feeding programmes and WHO recommendations are to reduce general antibiotic use, a combined GAM treatment protocol runs the risk of adding unwarranted antibiotics to the treatment of MAM. Standard MAM treatment protocols generally recommend monthly follow-up visits. Expanding this to weekly visits, the current standard for SAM treatment, may be unwarranted, especially given already limited resources and the additional burden on caregivers and healthcare providers.

Simplified RUTF dosing regimen

Whereas standard SAM dosing is weight-based, with several different dosages possible, in this context MSF-OCP used dosing based on results from phase one of the ComPAS study, which recommended simplified MUAC-based and single-product dosing, treating children with MUAC <115mm with two RUTF sachets per day and children with MUAC ≥115mm with one RUTF sachet per day (Bailey *et al.*, 2016). This regimen

greatly improved efficiency by pre-packaging RUTF into bundles with appropriate supplies of RUTF for either SAM or MAM treatment, which could then be easily and rapidly distributed to mothers as they passed through the patient circuit. The same system was used for Maiduguri and Bama, differing only in the duration the bundle was expected to cover (two weeks for Maiduguri and four weeks for Bama).

The simplified dosing was easily implemented and generally well accepted. OTP staff did, however, express concerns regarding MAM dosing and MUAC discharge cut-off, observing that many children plateaued around MUAC 120mm, taking a long time to reach the 125mm discharge cut-off. They felt this put an increased burden on daily caseloads and that children should either be discharged earlier or be given higher doses of RUTF.

Reduced follow-up

As outlined above, major constraints in Maiduguri were the large number of malnourished children, limited physical space in which to conduct activities, and the need to prioritise and allocate limited resources for maximum impact. Beneficiaries lived principally in the surrounding areas, so transport and access to the MSF health centres was not a barrier. SAM children responding positively to treatment were thus asked to attend follow-up sessions every two weeks, with parents being encouraged to return to the health centre sooner should there be cause for concern. This was well accepted by staff and parents and allowed for the treatment of twice as many children with SAM. Principle concerns and questions related to follow-up were again related to care of patients with MAM. While children with MAM recovering from SAM are generally seen weekly, standard follow-up for children with MAM is monthly. Combining treatment of SAM and MAM meant that all children with MAM were followed up every two weeks, thus doubling the frequency of MAM visits and contributing to over-crowded health centres.

In Bama, difficulty of access to the population for MSF teams necessitated decreased frequency of follow-up visits. All patients with acute malnutrition, MAM or SAM, were given a four-week supply of RUTF (dose dependant on MUAC), with the plan that the team would return in four weeks to screen the whole population again and allocate new supplies of RUTF accordingly. Medical follow-up was provided through access to general consultations as for the rest of the population. Although not an ideal situation, this was seen as a “better-than-nothing” solution: better to give therapeutic food, even without possibility of regular follow-up and surveillance, than to give nothing at all because of inability to provide the “full package”. Impact evaluation was not feasible due to lack of cohort follow-up, although population-based screening indicated decreased prevalence of acute malnutrition over time through this multidisciplinary intervention.

In other contexts, reduced follow-up may be an important aspect of regular (non-emergency) programming when access to CMAM programming is limited and parents/children are required

to travel long distances or make big sacrifices to reach centres for follow-up.

Integration of nutrition programming and access to general healthcare

As noted above, the number of actors providing nutrition programmes in Maiduguri increased dramatically as news of the emergency spread. The number of actors providing primary and secondary healthcare unfortunately changed very little during the same period, despite the high demand. Thus, left untreated, diarrhoeal disease and malaria continued to contribute to the burden of acute malnutrition. As recognised in UNICEF's conceptual framework of the determinants of childhood undernutrition, alongside inadequate nutritional intake disease is an immediate cause of malnutrition. Access to primary healthcare is fundamental to preventing acute malnutrition (and equally as important as provision of adequate nutrition), yet far too often it is neglected in standard vertical nutrition interventions.

Conclusions

The experience of MSF-OCP supports simplifying the treatment of acute malnutrition as a means for improving programme coverage and quality of care. Use of MUAC-based admission and discharge criteria, treatment with a single product, reduced follow-up visits for stable children and more efficient triage and patient flow reduced the workload and burden on staff and caregivers. They also enabled easier integration with primary and secondary healthcare and addressed the needs of a large number of children with malnutrition in an acute humanitarian crisis in an insecure region where access was often problematic. Documented outcomes met international standards and the approach allowed management of many more children than would have been feasible using the conventional approach. Outstanding questions remain, including around the best methods and criteria for identifying children at risk of, and suffering from, acute malnutrition in different age groups; optimal dosages for SNFPs; and whether different treatments are needed according to type and severity of acute malnutrition. It is essential that nutrition protocols retain the flexibility to adapt to varying and evolving contexts, but also to an evolving evidence and knowledge base.

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