

# Executive Summary

Child malnutrition is a major global public health problem. In developing countries, it is estimated that 19 million children are severely wasted and malnutrition is responsible for 11% of the total global disease burden. Challenges in managing acute malnutrition in infants <6m (MAMI) have been widely reported over the past eight years. Non-governmental organisations (NGOs) have undertaken different interventions in response, sometimes guided by field research. Until now, this accumulated body of experience has remained disparate and largely 'hidden'.

The aim of the MAMI Project was to investigate the management of acutely malnourished infants <6m in emergency programmes. The objectives were to:

- Establish the burden of acute malnutrition in this age-group
- Identify what guidelines, policies and strategies currently stipulate with regard to case management
- Determine practice in the field and make recommendations for future practice and research.

The MAMI Project focused on available treatment in selective feeding programmes.

The MAMI Project was implemented from March 2008 to July 2009 in a partnership between the Emergency Nutrition Network (ENN), University College London Centre for International Child Health and Development (CIHD) and Action Contre la Faim (ACF). A research advisory group (RAG) and an interagency steering group (IASG) informed research questions and the process. A draft framework for the management of acute malnutrition in infants <6m, modelled on the UNICEF conceptual framework on the causes of malnutrition, informed early planning and was further developed during the course of the project.

## Infant <6m burden of disease

To investigate the burden of disease of acute malnutrition in infants <6m, secondary analysis of 21 Demographic Health Survey (DHS) national datasets was carried out. This found that wasting in infants <6m is a prevalent public health problem, whether using NCHS<sup>1</sup> growth references or 2006 WHO Growth Standards (WHO-GS), but especially with WHO-GS. Infant <6m wasting prevalence ranged from 1.1% to 15.0% with NCHS and 2.0% to 34.1% using WHO-GS. Severe wasting increased over three fold and moderate wasting 1.4 fold when transitioning from NCHS to WHO-GS. Selective feeding programmes rely on

current size rather than growth monitoring for admission. On this basis, WHO-GS will result in particularly large increases in infants <6m eligible for admission to selective feeding programmes. As many selective feeding programmes use weight-for-height % of median (WHM) indicators, the implications of moving from WHM using NCHS to WHZ based on WHO-GS needs additional urgent investigation.

Further implications of these findings are that nutrition surveys should more routinely include infants <6m to establish local burden of disease, while feeding programmes should more actively consider the likely prevalence of infant <6m wasting.

## Guidelines review

A review of 14 international and 23 national guidelines for management of acute malnutrition found wide variation in the way acute malnutrition in infants <6m is addressed. Some only implicitly recognise the problem. Both inpatient and community-based guidelines recommend inpatient care for severe acute malnutrition (SAM) in infants <6m. They focus on nutritional treatments with the aim of restoring exclusive breastfeeding (using the supplementary suckling technique). Very few guidelines give details of moderate acute malnutrition (MAM) management in infants <6m or infant and young child feeding/ breastfeeding support. MSF guidelines (2006), ACF Assessment and Treatment of Malnutrition guidelines (2002) and IFE Module 2 were found to be important exceptions.

## Field data

Based on 33 selective feeding programme datasets from 12 countries, an analysis of individual and summary level data on infants <6m found that this demographic group accounted for 16% of admissions, ranging from 1.2% in Uganda to 23.1% in Tajikistan. The majority of infants <6m did not fulfil standard anthropometric SAM criteria for admission. In line with expectations, % mortality in infants <6m was significantly higher than children aged 6 to 59 months (4.7% vs. 4% respectively,  $p < 0.01$ ). Lack of survey data on infants <6m meant it was not possible to compare inpatient mortality figures with those of infants <6m in the general population. Few countries met all Sphere exit indicators for therapeutic care (Correction of Malnutrition Standard 2); current Sphere Standards have their limitations with regard to this age-group.

The analysis also showed that significant work is needed to harmonize and improve the quality of field

databases. Standardisation in reporting is needed, including database structure, case definitions, outcome coding and variable formatting, to facilitate future research and routine audit.

### Field experiences

Key informant interviews found that many therapeutic feeding programmes struggle in treating malnourished infants <6m. There is much inter-programme variation in the profile of admission, with a combination of clinical judgement and/or anthropometric indicators often used to determine admission. Nutritional and psychosocial care of the mother was often lacking. Experiences with the supplementary suckling technique were sometimes good but varied; staff time and experience were important limiting factors. Interviewees identified 'ways forward' that centred on admission criteria, guidance development, linking with other services, building staff capacity and 'on the job' training and support.

### Breastfeeding assessment tools

Fifteen breastfeeding assessment tools were reviewed to explore their potential application to MAMI in both inpatient and community-based settings. No one tool was identified as sufficiently sensitive for community use and specific for use in inpatient settings. Quality research studies to test the validity of existing breastfeeding assessment tools in different settings are needed. In the interim, UNICEF b-r-e-a-s-t, the UNICEF 2006 breastfeeding observation aid and the aids described in IFE Module 2 can be used to assess breastfeeding in programmes managing infants <6m. Severe maternal wasting and maternal and infant HIV status are just two of the important wider considerations when assessing breastfeeding effectiveness.

### Psychosocial considerations

WHO 1999 guidelines on treatment of SAM include guidance on psychosocial support and stimulation for children under five years and their mothers. The MAMI Project identified little guidance on specific stimulation activities for infants <6m, a lack of knowledge concerning the impact of severe malnutrition in infants <6m on psychosocial development, and little evidence of the long term effects of psychosocial support on this age group. Psychosocial stimulation is not currently integrated into community-based management of acute malnutrition (CMAM) recommendations and not routinely integrated into emergency programmes in general. Building upon a recent review of maternal depression and child growth, our review indicates evidence of the consequences of maternal depression on breastfeeding, child development and the ability to seek treatment. The available evidence is sufficient to recommend detection and appropriate treatment of maternal depression within the framework of management of infant malnutrition. Strengthened psychosocial stimulation/support of the inpatient

infant <6m, the mother-infant dyad and their families is needed. Studies are needed to explore which psychosocial support activities are most effective, when they should start, the minimum duration of intervention, the impact on social and emotional development of the child and/or on the mother-child relationship, and how to adapt these activities to the community care of malnutrition.

### Antibiotics review

Our review of antibiotic use in infants <6m shows the evidence base on antimicrobial treatment in infants <6m is severely lacking, and for malnourished infants and children needs urgently updating. Sensitivity to amoxicillin, which is the commonest currently recommended antibiotic, is low. There is a lack of intervention trials. New trials are needed which use current case definitions of acute malnutrition, especially in settings where HIV is now prevalent.

### Change in model of care?

The population burden of acute malnutrition in infants <6m, the varied profile of current caseloads and the challenges in inpatient management suggests a radical shift in the model for management of acute malnutrition in infants <6m is needed. A move towards community-based care is an appropriate model to consider. Such a development would harmonise acute malnutrition management for infants <6m with that of older children and broaden opportunities to tailor care for larger numbers. It may also offer a more appropriate and safer setting to manage infants <6m that present early and with more manageable feeding problems ('uncomplicated' cases). Inpatient care could be reserved for those infants needing specialist clinical and dietetic care ('complicated' cases). Research is needed to explore the safety, practicality and cost-effectiveness of such an approach. Improved clinical assessment strategies are needed to enable triage, to identify those with urgent need and to enable inter-programme comparisons.

### The way forward

In the immediate term, there are many resources, good practices, and initiatives to consolidate and build upon. Existing guidelines with strong MAMI components are MSF guidelines 2006, ACF Assessment and Treatment of Malnutrition, 2002 and IFE Module 2. Strategies with potential to improve inpatient outcomes of 'complicated' infant <6m SAM include implementation of routine kangaroo care, breastfeeding 'corners' with skilled breastfeeding support, and tailored psychosocial stimulation/support of infants <6m. Strategies with potential for effective outpatient-based care of infant <6m with MAM and 'uncomplicated' SAM include community-based breastfeeding support, psychosocial support programmes and women's groups programmes. Closer links are needed with existing programmes that may impact on infant <6m

malnutrition, such as reproductive health services, the Baby Friendly Initiative, Integrated Management of Childhood Illness (IMCI) and growth monitoring programmes. Strategies to treat infant malnutrition in the context of HIV should not only consider interventions that seek to avoid HIV transmission, but also those that support maternal and child survival. Access to anti-retroviral treatment (ARV) for HIV-exposed mothers and infants and safer infant feeding practices are key determinants of HIV-free child survival.

The MAMI Project has identified research needs on a range of topics, from anthropometric indicators suitable for use in the community, to breastfeeding assessment tools, to nature and effect of skilled breastfeeding counselling on severely malnourished infants. Resources needed – monetary, time, skill set – must be quantified to enable cost-benefit analysis and to ascertain the viability of scale-up of interventions.

Assessment of how well programmes are treating infant <6m malnutrition needs to be strengthened and based upon robust data. Critically, performance must capture the clinical, psychosocial and contextual complexity of infants treated and establish programme population coverage of infant <6m SAM/MAM.

Key collaborative initiatives to learn from include the SFP Minimum Reporting Standards Package, the Vermont-Oxford Network to improve neonatal care, and experiences from the rollout of the 1999 WHO guidelines. Data sharing and partnership are needed to enable continued inter-agency dialogue. Harmonised databases and coding systems would enable easier audit. In this regard, an update in the SFP Minimum Reporting Standards package to include infants <6m is recommended.

The lack of an evidence base to formulate MAMI guidelines remains a big gap and a combination of systematic reviews, high quality randomised control trial-type studies and operational research is needed. Formal frameworks, such as GRADE and the Child Health and Nutrition Research Initiative (CHNRI) might usefully guide which policies and research projects should be prioritised. More resources should be devoted to future guideline development and tools such as GRADE and AGREE used to better enhance their quality.

### Conclusions

The MAMI Project has found that the burden of care for infants <6m is significant, the implications of the rollout of the 2006 WHO Growth Standards for infants <6m are important and need to be explored urgently, the current evidence base for treating malnourished infants <6m is relatively weak and that programmes struggle using current guidelines to manage malnourished infants <6m. Of most immediate concern

is the lack of explicit consideration to infants <6m in current guidelines and lack of explicit recognition of this age-group in recent statements on malnutrition treatment and 2006 WHO-GS rollout. This risks the presumption that care for older children can safely be extended to infants <6m and/or perpetuates the assumption that infants <6m are all well nourished. A valuable contribution to help address this would be a statement on MAMI that highlighted the concerns, gaps and immediate considerations for this age-group to guide practice in the short-term. Such a statement could have significant impact if made by the Global Nutrition Cluster through engagement of Nutrition Cluster members, the MAMI Project research team, RAG and IASG members.

In the future, a more radical shift in the model for MAMI is likely needed. For older children, the evolution to community based management of acute malnutrition was driven by a strong vision, a clear research agenda and well documented field experiences. The challenge now is how to improve nutritional, clinical and public health outcomes in infants <6m.