Management of Acute Malnutrition in Infants (MAMI) Project

Summary Report

October 2009

This summary report presents the key findings and recommendations of the Management of Acute Malnutrition in Infants (MAMI) Project.

The MAMI Project was implemented in collaboration between the Emergency Nutrition Network (ENN), University College London Centre for International Child Health and Development (CIHD) and Action Contre la Faim (ACF).

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Feedback
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The full MAMI report is available at www.ennonline.net/research

Cover: Mothers with malnourished infants under 6 months, managed in a TFC in the Democratic Republic of the Congo. C Wilkinson/ACF, DRC, 2007.

Design and layout www.holytrousers.com

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1.0 Overview of MAMI Project

Objectives

The aim of the MAMI Project was to investigate the management of acutely malnourished infants under six months of age (infants <6m) in emergency programmes, in order to improve practice by contributing to evidence-based, better practice guidelines.

The objectives were:
*   To establish the infant burden of disease[1].
*   To establish what is currently advised in the form of guidelines, policies and strategies.
*   To determine what is carried out in practice.
*   To make recommendations for future practice and research.

The MAMI Project focused on treatment in emergency contexts, with specific reference to supplementary feeding programmes (SFP) and therapeutic feeding programmes (TFP), collectively described as selective feeding programmes.

Method

The MAMI Project was implemented from January 2008 – July 2009. The process involved a MAMI 'core' team comprising the Emergency Nutrition Network (ENN), the Centre for International Health and Development (CIHD) and Action Contre la Faim (ACF), a research advisory group (RAG) and an interagency steering group (IASG) of United Nations (UN) agencies, non-governmental organisations (NGOs) and independent individuals with relevant experiences[2]. Collaboration was through face to face meetings, e-mail and phone. During the course of the project, opportunities were taken to explore emerging key issues relevant to but beyond the remit of the original project, specifically examination of infant wasting burden of disease, a review of breastfeeding assessment tools and a review of antibiotic use in infants < 6m.

Outputs

The main outputs of the MAMI Project are this summary report, a full report (available at www.ennonline.net/research) and publication of key findings (in process and planned). Several results have already been shared at national and international meetings in the UK, Malawi and Bangkok[3].

It is important that this final report marks not the end but the beginning of a much longer term process. Implications of project findings and development of 'ways forward' on MAMI require wider consultation and consensus, which goes far beyond the scope of the original project. We hope that the findings within stimulate discussion, debate and renewed interest in MAMI, and provide a platform from which such a consultative process can begin.

Guide to summary report

The MAMI Project summary report opens with a brief outline of some of the contextual considerations to MAMI (Chapter 2). Chapter 3 describes the burden of malnutrition for infants <6m, what guidance exists on their treatment, how they are managed in programmes and what are the challenges faced by those charged with their care. Chapter 4 shares additional considerations given to MAMI, informed by the findings of Chapter 3. The report concludes with overall recommendations and suggestions for the 'way forward'. Key resources are annexed. This summary report mirrors the full MAMI report, available at www.ennonline.net/research

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[1] This first objective was not in the original project objectives, but was added following initial consultations with stakeholders.
[2] A full list of members and contributors is included the main MAMI report.
[3] Royal Society of Tropical medicine meeting, Dec 2008; Child Health annual meeting, April 2009; MAINN (Maternal & Infant Nutrition & Nurture) Conference, UK, workshop session on MAMI led by Marko Kerac ; CAPGAN (Commonwealth Association of Paediatric Gastroenterology & Nutrition), Blantyre, Malawi, August 12th to 16th 2009; Sphere Regional Consultation, Malawi, August 2009; MSF (Medecins Sans Frontiers) Scientific Day London, UK, June 11th 2009; Infant feeding in emergencies UNICEF regional training, Nairobi, July, 2009; Working Group on Nutrition in Emergencies, SCN 1 day meeting, Bangkok, 10th October, 2009; Nutrition Cluster Meeting, London, 20 October 2009; Sphere Core Meeting, London, 22-23 October, 2009

2.0 Setting the scene

A global perspective

Child malnutrition is a major global public health problem. In developing countries, it is estimated that 19 million children (3.5%) are severely wasted and malnutrition is responsible for 11% of total global disease burden. Undernutrition is responsible for 35% of child deaths. In some regions, notably in sub-Saharan Africa, HIV is an added challenge, frequently underlying and contributing to malnutrition.

Infants <6m are unique

Infants <6m are a unique group due to their particular feeding needs (exclusively breastfeeding is the norm), physiological and developmental differences from older children, vulnerability to a different range of pathologies and increased mortality risk compared to older children. All infants <6m are not the same – a 1 month old is very different to a 5 month old. The period 0-6 months is part of a larger, critical 'window of opportunity' (-9 to 24 months), within which the impact of undernutrition has both immediate and longer term adverse consequences.

Infant and Young Child Feeding (IYCF) framework

Sub-optimal infant and young child feeding (IYCF) practices increase vulnerability to malnutrition, disease and death and, in general, the younger the child is the more vulnerable they are. The protection and support of optimal IYCF is mandated by international law, strategies, policies and guiding principles[4]. It is necessary for meeting international goals (Millennium Development Goals), standards (Sphere Project) and is regulated and detailed in technical and operational guidance (e.g. Operational Guidance on Infant and Young Child Feeding in Emergencies).

Management of acute malnutrition framework

The World Health Organisation (WHO) case definitions of acute malnutrition (1999) based on oedema and weight for height[5] are the basis of almost all current national and international protocols managing acute malnutrition. Mid Upper Arm Circumference (MUAC) is also increasingly being used[6]. Severe acute malnutrition (SAM) is commonly treated in therapeutic feeding programmes (TFPs). These are usually inpatient-based for 'complicated' SAM and outpatient focused for 'uncomplicated' SAM. WHO (1999) guidelines emphasise the need for 'phased' treatment approaches and focus on high quality, inpatient-based care. CMAM (Community based management of acute malnutrition) is a complementary approach that focuses on outpatient home-based care during phase 2 of treatment and aims to achieve high programme coverage and public health-level impact. CMAM involves community based screening, community mobilisation and relies on the use of Ready to Use Therapeutic Food (RUTF). Moderate acute malnutrition is typically managed in supplementary feeding programmes (SFPs).

MAMI Framework

A draft framework for the management of acute malnutrition in infants <6m, modelled on the UNICEF conceptual framework for the causes of malnutrition, informed early discussions with the RAG and the IASG. This was further developed during the course of the project and is included in Appendix A.

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4 These include the Convention of the Rights of the Child, UNICEF/WHO Global Strategy on Infant and Young Child Feeding (2003), the International Code of Marketing of Breastmilk Substitutes (1981) and subsequent relevant World Health Assembly Resolutions ('the Code'), and the WHO Guiding Principles on Infant and Young Child Feeding in Emergencies (2004).
5 Moderate Acute Malnutrition (MAM) < -2 and ≥ -3 Z-scores weight-for-height (NCHS or WHO norms) or <80% and >=70% of median weight-for-height (NCHS norm) or oedema
6 Severe Acute Malnutrition (SAM) <-3 Z-score weight-for-height (NCHS or WHO norm) or <70% of median weight-for-height (NCHS norm) or oedema. MAM: MUAC <125mm; SAM: <115mm. MUAC currently not indicated in infants <6m.

3.0 Key findings & recommendations

3.1 Burden of acute malnutrition in infants <6m

To investigate the burden of acute malnutrition in infants <6m, secondary analysis was conducted of 21 Demographic Health Survey (DHS) national datasets from nutritionally vulnerable countries[7].

The prevalence of mulnutrition (wasting[8]) was described using using standard criteria applied to both National Centre for Health Statistics (NCHS) growth references and WHO 2006 growth standards (WHO-GS):

Wasting = Weight for height z score (WHZ) <-2
Severe wasting = WHZ <-3
Moderate wasting = WHZ ≥-3 to <-2

Data were available for a total of 163,228 children 0 to <60 months (mean 7,773 per country; range 1,710 to 45,398) and included 15,534 infant <6m.

Four major analyses examined age-specific effects: prevalence of wasting by country, changes in country prevalence of wasting using WHO-GS, caseload implications for treatment programmes, and characteristics of wasted infants <6m.

Findings

Using NCHS growth references, infant <6m wasting prevalence ranged from 1.1% to 15.0% (mean 4.9%). Diagnosis using WHO-GS resulted in greater estimates of burden, ranging from 2.0% to 34.1% (mean 13.6%).

The magnitude of change in prevalence when transitioning from NCHS to WHO-GS was greater for infants <6m than for older children; severe wasting increases over 3 fold in infants <6m and moderate wasting 1.4 fold. This compares to 1.7 fold and 0.86 fold differences for children 6m to 59m.

Wasted infants <6m were not predominantly ex-low birth weight (LBW) and age distribution of wasting was fairly even.

The burden of disease of infants <6m wasting was strongly and positively correlated with burden of disease of child 6 to 59 months wasting.

Conclusions & Recommendations

Wasting in infants <6m is a prevalent public health problem whether diagnosed using NCHS or WHO growth norms. Use of WHO-GS will affect prevalence estimates for both infants and children, but especially infants<6m.

Serial growth monitoring is often lacking in infants <6m that present to selective feeding programmes; treatment protocols rely on current size rather than an assessment of growth. Used in this way, the WHO-GS result in particularly large increases in estimates of the numbers of infants <6m eligible for admission to selective feeding programmes. A risk-benefit analysis of a potential large increase in infants <6m presenting to current feeding programmes is needed. A priority investigation is how single and serial growth measures and chart position is interpreted by health workers using NCHS v WHO-GS based growth charts.

While the comparison above is based on the use of WHZ, 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 urgently needs to be explored to determine more accurately how the shift to WHO-GS will affect individual diagnosis and outcomes for infants <6m.

Nutrition surveys should, where feasible, include infants<6m to establish the local burden of disease and feeding programmes should more actively consider the likely prevalence of infant <6m wasting in the population. Including infants<6m in surveys will require training specific to assessment in this age group and appropriate equipment. Regression equations used in the MAMI Project analysis could be used to estimate the infant <6m wasting prevalence from the prevalence in children 6 to 59 months. This should

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[7] Datasets were selected from a reference population of 36 counties identified in the 2008 Lancet 'Maternal and Child Under-
     nutrition' series as accounting for over 90% of global malnutrition.
[8] Data on oedematous malnutrition is not collected in DHS surveys and so could not be included.

only be a stop gap measure where there is an absence of other information; further validation is needed before estimates could be considered reliable or precise.

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 urgently needs to be explored to determine more accurately how the shift to WHO-GS will manifest at field level for infants <6m.

Further research is also needed into the prevalence of oedematous infant <6m SAM, whether WHZ is the best indicator for this age, how well different anthropometric indicators predict mortality, and the clinical profile of malnourished infants <6m.

3.2   Review of current MAMI guidelines

A total of 37 guidelines (14 international and 23 national) for management of acute malnutrition (both inpatient and community-based approaches) were identified for review. Internationally recognised AGREE (Appraisal of Guidelines for Research and Evaluation) criteria were used to appraise guideline quality[9].

Findings
Most guidelines share a common origin in the WHO 1999 guideline[10] and describe the '10 steps' approach to care. CMAM is rapidly being recognised as the 'norm' for the management of acute malnutrition for children aged 6 to 59 months, and the Valid International field manual a key reference[11].

MUAC is frequently used in the guidelines as an independent admission criterion, though in no guidelines is it recommended for use in infants <6m.

There is wide variation in how current guidelines address acute malnutrition in infants <6m. Some only implicitly recognise the problem.

There is inconsistency in age, weight and length cut-offs used to identify infants <6m for admission and their subsequent treatment.

All guidelines recommend inpatient care for SAM in infants <6m and focus on nutritional treatments with the aim of restoring exclusive breastfeeding (using the supplementary suckling technique[12]). Very few guidelines give details of the how to manage MAM in infants <6m.

There is no direct guidance for management of SAM and MAM in infants <6m at community level.

Kanagaroo care[13] for nursing young/small infants is noted in many guidelines as a treatment for hypothermia. IFE Module 2 recommends Kangaroo care to both prevent and treat hypothermia in severely malnourished infants, and in LBW infants.

Few guidelines include details of IYCF/breastfeeding support. MSF guidelines 2006, ACF Assessment and Treatment of Malnutrition, 2002 and IFE Module 2 are important exceptions[14] (see Annex B for details).

Conclusions & recommendations
MSF guidelines 2006, ACF Assessment and Treatment of Malnutrition, 2002 and IFE Module 2 and are good references/templates for future development of MAMI guidelines.

Future guidelines should build on lessons learnt for both SAM and MAM management. Guidelines should give more details on IYCF/ breastfeeding support, medical treatment (including HIV, LBW) and maternal factors (including nutritional and psychosocial support).

Strategies with potential to improve outcomes of infant <6m SAM include implementation of routine kangaroo care for all 'complicated' cases of malnourished infants <6m managed in inpatient settings.

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9   www.gradeworkinggroup.org. A formal AGREE scoring was not applied to each individual guideline, as this was beyond the scope of the MAMI Project, but the AGREE framework was used to highlight common issues.
10 WHO. (1999) Management of severe malnutrition: a manual for physicians and other senior health workers. World Health Organisation. Geneval: World Health Organisation.
11 Valid International (2006) Community-based Therapeutic Care (CTC). A Field Manual. Oxford: Valid International.
12 A technique where a mother is supported to breastfeed while simultaneously administering supplemental milk via a naso-gastric tube attached to the breast. As breastmilk production increases, supplemental milk is reduced.
13 Kangaroo care is a technique where the infant is held in continuous skin-to-skin contact with an adult, usually the mother. It facilitates temperature regulation, reduces infant stress, and helps establish and maintain breastfeeding.
14 A new training content to integrate IYCF into CTC/CMAM (ENN, IFE Core Group & collaborators) has been piloted and finalised since this guidelines review. It is included in Appendix B.

In the context of international rollout of CMAM programmes, it is noteworthy that approaches to MAMI are predominantly inpatient-focused. Given the expected changes in infants <6m presenting to programmes, options for outpatient based care in infants <6m should be considered and evidence gathered on their effectiveness and safety. Future guidelines should reflect changes.

Greater clarity and accompanying guidance is needed on anthropometric criteria, cut-offs and age assessment for infants <6m.

More resources should be devoted to future guideline development. Tools such as and AGREE[15] and GRADE (Grading of Recommendations Assessment, Development and Evaluation)[16] should be used to better enhance the quality of future guidelines. An open access online 'guideline library' could facilitate development of future documents.

3.3   Review of field treatment of malnourished infants <6m

Data on infants <6m from selective feeding programmes was analysed to investigate the proportion of current feeding programme admissions that are infants <6m, and describe their anthropometric status, clinical profiles, and outcomes.

Two types of database were analysed:
a) Thirty-three 'raw' databases with individual-level data from 12 countries. These were the main focus of analysis.
b) Summary databases from 22 programmes in 7 countries, reporting overall programme outcomes by age category. These was used to assess the difference in mortality as an outcome between infants <6m and children.

A total of 25,195 children (4,002 infants < 6m) were included in the main analysis. Programme profiles and outcomes were compared between infants <6m and children aged 6 to 59 months by country and by programme type.

There were significant inter-database variations in structure, coding and data entry, within and between agencies. Data cleaning, analysis and interpretation were both time intensive and challenging.

Findings

Admission profile
Infants <6m accounted for 16% of admissions, ranging from 1.2% in Uganda to 23.1% in Tajikistan (individual level data analysis). The percentage of admissions who were infants <6m in different programme types ranged from 10% in home treatment to 25% in day centres.

Anthropometry
Overall, infants <6m had a higher proportion of measurements missing or wrongly recorded. Missing values for length were greater in infants <6m. It was not possible to calculate WHZ and WHM for 40% of the sample, mostly due to infants having height of <49 cm, for which there are no WHZ and WHM references. The range of missing data for infants <6m varied widely between countries and programme type.

MUAC was measured in 40% of infants <6 months, even though not recommended for this age group. This measurement was mostly clustered in stabilisation centres and therapeutic feeding centres (TFCs).

The majority of infants <6m did not fulfil standard anthropometric criteria for SAM (<-3 WHZ or <70% WHM). Weight <4kg was observed in 90.5% of all infants <6m and weight <3.5kg in 81.8%.

Outcomes
Key variables analysed in databases were programme type, patient age and sex, anthropometry, outcome (cure, died, transferred, etc) and key dates (admission, discharge). Cautious inference is needed given the lack of other variables on possible key confounders (e.g. HIV status, LBW status, linear growth, clinical status at programme admission). There were no available data on programme coverage, context, or the prevalence of SAM in the infant <6m population.

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15 http://www.gradeworkinggroup.org/
16 Jaeschke, R., Guyatt, G.H., Dellinger, P., Schunemann, H., Levy, M.M., Kunz, R., et al. (2008) Use of GRADE grid to reach decisions on clinical practice guidelines when consensus is elusive. BMJ. 2008;337:a744.

Findings included:

- Presence of *oedema* was consistently lower in infants <6m. The risk ratio of presenting oedema was 0.1 (range: 0.08 – 0.12) when compared to children aged 6 to 59 months.

- In line with expectations, overall % *mortality* in infants <6m was significantly higher than children aged 6 to 59 months (4.7% vs. 4.0% respectively, p<0.01). A risk ratio of 1.29 (ranging from 1.08-1.53, p<0.01) was observed. It is important to note that the lack of contextual and survey data on infants<6m meant it was not possible to compare inpatient mortality with mortality amongst infants <6m in the general population.

- Applying the WHO TFP inpatient guidelines on mortality to infants <6m, 50% of countries (6/12) had a 'good' mortality rate of <5%, 16% (2/12) had 'moderate' rates of 5-10% and 33% (4/12) had or exceeded 'poor' rates of 11-20%. For children 6 to 59 months, the rates were 67% (8/12), 8% (1/12) and 25% (3/12) for good, moderate and poor programme mortality outcomes, respectively.

- Overall, the proportion of admissions discharged as 'cured' did not differ between infants <6m and children 6 to 59 months (75% vs. 74%).

- Bearing in mind the limitations of applying Sphere Standards to infants <6m (see below), few countries met all Sphere exit indicators for therapeutic care (Correction of Malnutrition Standard 2). One quarter (25% (3)) of countries had >75% *cure* rates in infants <6m compared to 42% (5) in children 6 to 59 months old. For *mortality*, 66% (8) of countries met the Sphere standard (<10%) for infants <6m, compared to 60% (9) for 6 to 59 months olds. Conversely, all countries met the *defaulting* Sphere standard (<15%) for infants <6m, compared to 75% (9) for children 6 to 59 months of age.

Limitations of current Sphere Standards

Current indicators to achieve Sphere Standards (2004) to correct malnutrition have their limitations with regard to infants <6m. It is not clear whether Sphere exit indicators for children under five years include infants <6m or should be applied to infants <6m. While a Sphere indicator is included on the importance of breastfeeding and psychosocial support in SAM treatment, there is no clear guidance on how to measure this. Staff: patient ratio recommended for children (1:10) may not be sufficient for infants <6m.

Conclusions & Recommendations

Acutely malnourished infants <6m are admitted to selective feeding programmes and do warrant attention and resources. Attention and resources should be diverted to their management in selective feeding programmes.

Staff training and appropriate equipment are needed to improve the quality of anthropometric assessment of infants <6m.

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.

Feeding programme data should be disaggregated by age, to enable closer analysis. Routine indicators of feeding status on entry and exit to programmes are necessary.

In the area of moderate malnutrition management, there is work well in progress to standardise reporting and establish minimum reporting standards in SFPs, focused on children 6 to 59 months[17]. There are lessons to learn from this approach. In addition, an update in the SFP reporting package to include infants <6m is warranted.

Few countries met all Sphere exit indicators for therapeutic care of infants <6m (Correction of Malnutrition Standard 2). Current Sphere indicators to correct malnutrition have their limitations with regard to infants <6m. The MAMI report findings should inform Sphere Standards update. A process of quality improvement should be implemented to help programmes to reach Sphere Standards for infants <6m.

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[17] Minimum Reporting Standards for SFP project. http://www.ennonline.net/research/sfp.aspx

3.4   Key informant interviews

Key informant interviews were used to further understand field experiences and 'front-line' perspectives on the management of acute malnutrition in infants <6m, to help identify relevant issues not captured by the quantitative data and priority areas for improving outcomes. This comprised a IASG meeting to identify themes, a series of semi-structured key informant interviews by telephone (33 in total) and two field visits to clinical settings (Kenya and Malawi).

Findings

Many TFPs struggle in treating malnourished infants <6m. There is little information on programme coverage of MAMI as this group is not routinely included in nutrition surveys. Assessment of growth history of infants <6m is difficult due to use of different indicators in the community (weight-for-age) and for admission (weight-for-height, MUAC), lack of serial measures and poor quality of anthropometric measurements. Guidelines for MAMI are inconsistent and lack information on supporting mothers/caregivers and on specific issues (e.g. supplementary suckling, therapeutic milks, orphans, and HIV).

Not all programmes actively seek malnourished infants <6m and not all presentations or admissions of infants <6m are recorded. Some are referred elsewhere (e.g. to paediatric wards) without recording this in the feeding programme statistics.

There is much inter-programme variation in the profile of infants<6m. There appear to be two broad 'types' of infant <6m who present: infants with reported feeding problems but who are clinically stable (and often mothers requesting food) and infants that present clinically unwell. A combination of clinical judgement and/or anthropometric indicators is often used to determine admission that varies greatly.

Many caregivers expect food or at least treatment with therapeutic foods/milks. Nutritional and psychosocial care of the mother was often not explicit and consequently lacking in programmes.

Examples of good practice exist, such as the use of 'breastfeeding corners' to assess breastfeeding pre-admission and supplementary suckling, a core treatment in many current guidelines. However, experiences with supplementary suckling varied; some users report excellent success rates, others cite difficulties. Staff time and experience were important limiting factors.

Managing orphans and non-breastfed infants was identified as a major challenge, both in treatment and longer term follow-up.

What constitutes follow-up for all infants<6m is not clear. Community-based services for moderately malnourished children and follow up of non-admissions/discharges was variable and generally poor. Links to other clinical services are often not smooth.

There is a lack of staff capacity and skills to support breastfeeding and an absence of formal MAMI training and staff induction.

No data or evidence were identified on the time and costs associated with providing skilled inpatient or outpatient breastfeeding support in inpatient or outpatient feeding programmes; documented experiences in topical areas like supplementary suckling have tended to focus on the technical aspects and challenges.

Conclusions & recommendations

Interviewees identified 'ways forward' that centred on admission criteria, guidance development, linking with other services and building staff capacity. Collation of current good practices and useful materials would be a useful research and development tool to inform future field guidance.

The identification of infants <6m for admission must be improved. This requires technical guidance for the inclusion of infants <6m in nutrition surveys, better assessment tools for the mother-child pair, and guidance and more fitting equipment for the anthropometric assessment of infants <6m, e.g. suitable weighing scales. Growth monitoring tools could be harmonised with entry criteria to feeding programmes.

Improved guidelines for MAMI need to include management of specific 'problem' areas. Maternal expectations, good communication on treatment plans and maternal nutrition should also be included. Initiatives to nurture links which include the Baby Friendly Initiative and growth monitoring programmes.

Strategies to improve SAM assessment and management in infants <6m include 'breastfeeding corners'/ separate mother and baby areas where skilled breastfeeding support is available and enabling peer-to-peer support.

MAMI training should be integrated into formal courses and 'on the job' training and support provided to field staff with simple tools and materials.

Further research is needed to determine the efficacy of supplementary suckling, the best therapeutic milks to use and the efficacy of community-based models of care for infants <6m.

Improving inpatient care to infants <6m and developing outpatient support needs to be informed by assessment of the costs and resource implications of such interventions.

3.5 Review of breastfeeding assessment tools

Many malnourished infants <6m present with reports of breastfeeding problems and exclusive breastfeeding in infants <6m is the treatment goal of most guidelines reviewed. However most current SAM guidelines do not include or refer to specific breastfeeding assessment tools that might better identify the exact nature of the breastfeeding problem. Hence a review of the breastfeeding assessment tools currently available and their potential application to the MAMI context was carried out.

Findings
Fifteen breastfeeding assessment tools were identified in the literature search. No one tool was identified as sufficiently sensitive for community use and also specific for use in inpatient settings. Many tools were either too narrow in scope or have not been robustly validated by external outcomes, especially in nutritionally vulnerable developing country/emergency settings.

Conclusions & recommendations
Quality research studies to test the validity of existing breastfeeding assessment tools are needed. The Breastfeeding Assessment Tool (BAS)[18] could be tested for its suitability to community settings (e.g. use by community health workers for case finding and assessment). Half of the tools reviewed could be useful for inpatient assessment.

In the interim, UNICEF b-r-e-a-s-t[19, 20], the UNICEF 2006 breastfeeding observation aid[21] and the aids described in IFE Module 2[22] should be used to assess breastfeeding in programmes managing infants <6m.

New tools should be developed, possibly based on existing tools, to meet the needs of malnourished infants <6m, suitable for use in case finding in the community, inpatient settings and outpatient primary healthcare programmes.

The success of a breastfeeding assessment tool and how it relates to nutritional/morbidity outcomes is dependent on the interventions available to address problems identified. The lack of a 'gold standard' treatment for infants <6m is a limiting factor in this regard. Severe maternal wasting and maternal and infant HIV status are just two of the important wider considerations when assessing breastfeeding effectiveness.

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[18] Hall et al, 2002. A breast-feeding assessment score to evaluate the risk for cessation of breast-feeding by 7 to 10 days of age. J Pediatr 2002;141:659-64

[19] Body position, Responses, Emotional Bonding, Anatomy, Suckling, Time suckling.

[20] WHO/UNICEF, 1993. Breastfeeding counselling a training course. Participants Manual. P21. 1993. WHO/CDR/93.5 UNICEF/NUT/93.3

[21] UNICEF, 2006. BABY-FRIENDLY HOSPITAL INITIATIVE. Revised, Updated and Expanded for Integrated Care. Section 3.2, p91

[22] IFE Core Group (2007) Infant feeding in emergencies. Module 2. Version 1.1 Developed through collaboration of ENN, IBFAN, Terre des Hommes, UNICEF, UNHCR, WHO, WFP. For training, practice and reference.

3.6   Psychosocial aspects of MAMI

The MAMI Project considered some key influences around the maternal-child relationship with regard to malnutrition. A review was conducted of the scientific basis and feasibility of stimulation activities in the treatment of severe malnutrition, with particular reference to the WHO 1999 guidelines. The influence that maternal depression has on child malnutrition was also investigated, building upon a recent review of maternal depression and child growth and considering implications for emergency programmes and infants <6m specifically.

Findings

Malnutrition is not an isolated medical-nutritional problem, but a consequence of factors related to context, environment, and family, amongst others. The psychosocial causes of malnutrition are dependent on geopolitical, cultural, social and psychological contexts. Conflict situations, crisis, and traumatic events can have a negative impact on the caregiver-infant relationship and thereby on nutrition. A malnourished infant may reflect the problems experienced by his/her mother, father and family. It is essential to consider the surrounding environment of the infant in order to target appropriate support and treatment for recovery.

In general, it is the mother-child relationship that is the main determinant of childcare practices and whose relationship is especially important in infants <6m. Attachment to the mother, or another maternal figure, is as essential a need for the child's survival as daily care. Simply providing care to infants in a mechanical way is not enough for good development.

Studies indicate the social support system of mothers is particularly important for the mother's mental health and therefore the care of her children. Control of resources, autonomy, workload and time constraints all impact on a mother's capacity to care for her infant. What can appear to be irresponsible or negligent behaviour by the mother may actually reflect suffering experienced in a social situation that has become unbearable. A community has a key role in ensuring the well-being of its children.

WHO 1999 guidelines on treatment of SAM include guidance on psychosocial support and stimulation for children and mothers. Evidence shows that stimulation during and after treatment improves the development of severely malnourished children well into adolescence compared to non-stimulated children, even if development levels remain low.

Evidence is lacking on the medium and long term impact of stimulation programmes on child's growth and effectiveness of SAM treatment, on mothers' practices at home and on the impact on malnourished infants <6m. Impact of severe malnutrition in infants <6m is not known, there is little guidance on specific stimulation activities for this age group and little evidence of the long term effects of psychosocial support on this age group.

Psychosocial stimulation is not currently integrated into CMAM recommendations and not routinely integrated into all emergency feeding programmes.

The mother-infant relationship is vital for the proper health and development of the child. This may be compromised in emergencies and is both a cause and consequence of malnutrition. Mothers need support to protect this relationship. Postnatal depression has a negative impact on child development and an association between maternal depression and infant malnutrition can be inferred. The mechanisms between depression and malnutrition are probably multiple and are both direct and indirect. A better understanding is necessary to identify the processes and factors at play.

Conclusions & Recommendations

Wherever possible, psychosocial support for mothers and infants, the mother-infant dyad, and the family should be routinely included in all programmes for the treatment of SAM, both inpatient and outpatient based. Most of the evidence for stimulation comes from inpatient care. Projects must be developed and tested to assess appropriate methods of providing social support and stimulation in community-based aspects of CMAM programmes. Emergency programmes do currently incorporate psychosocial elements - these should be described and assessed for their impact.

The consequences of maternal depression on breastfeeding, child development and the ability to seek treatment are sufficient to recommend detection and appropriate treatment of maternal depression within the framework of management of infant malnutrition.

A large number of 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 locate these activities in the community care of malnutrition.

4.0 Other MAMI considerations

4.1 Inpatient and outpatient MAMI

The population burden of acute malnutrition in infants <6m suggests a radical shift in the model for management of acute malnutrition in infants <6m is needed if adequate treatment coverage is to be achieved. The wide variation in inpatient profiles and the challenges in inpatient management also suggest a new approach is required. A move towards community-based management of acute malnutrition in infants <6m is an appropriate option to consider. Such a development would harmonise acute malnutrition management for infants <6m with that of older children. It would 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). Before such a shift in the paradigm of therapeutic care can happen, research is needed to explore the safety, practicality and cost-effectiveness of this approach.

4.2 Admission criteria

Admission criteria should identify patients whose death can be averted by a particular therapeutic intervention. There is uncertainty about admission criteria for malnourished infants <6m. Many current guidelines recommend the same anthropometric admission criteria (often combined with a variety of clinical criteria) for infants <6m as for older children. The exception is MUAC, which is not currently recommended for infants <6m. As shown earlier, if using current anthropometric criteria in conjunction with new WHO-GS, numbers of infants <6m admitted is likely to rise substantially. There is also uncertainty around the clinical identification of high risk infants.

A shift to the 'complicated' vs 'uncomplicated' model in this age group would require more conservative inpatient admission criteria for 'complicated' cases and new admission criteria for outpatient treatment of 'uncomplicated' cases. There is a need to establish clinical criteria for admission to treatment programmes for infants <6m, to enable triage, to identify those with urgent need and to enable inter-programme comparisons.

TFP admission has an implicit objective of reducing the mortality risk through restoring normal nutritional status. However the benefits for infants <6m of the interventions currently on offer are less certain than for older children, for whom well delivered treatment programmes (utilising both inpatient focused[23] and CMAM approaches[24]) have been shown to be consistent with good outcomes. To our knowledge, the cost effectiveness of treating malnourished infants <6m has not been formally evaluated.

4.3 Inpatient and outpatient breastfeeding support

Several reviews suggest that community based support improves rates of exclusive breastfeeding. There is limited data on increasing exclusive breastfeeding rates in emergency contexts. Increased exclusive breastfeeding in the context of HIV show optimal feeding practices are achievable with good community-based support.

23   Ashworth A, Chopra M, McCoy D, Sanders D, Jackson D, Karaolis N, et al. WHO guidelines for management of severe malnutrition in rural South African hospitals: effect on case fatality and the influence of operational factors. Lancet. 2004 Apr 3;363(9415):1110-5.
24   Collins S, Dent N, Binns P, Bahwere P, Sadler K, Hallam A. Management of severe acute malnutrition in children. Lancet. 2006 Dec 2;368(9551):1992-2000.

There is evidence that skilled breastfeeding counseling can have significant added value in improving exclusive breastfeeding rates and outcomes in sick infants. Little consideration is given to skilled breastfeeding support in current SAM guidelines, including for older infants and young children where it is also important.

Based on current evidence, it is plausible that skilled breastfeeding counseling and support would also be effective for malnourished infants; this needs to be tested in both inpatient and community-based settings. Investigations need to also take account of staff time, skill sets and intervention costs to inform cost-benefit analysis.

4.4   Clinical identification of high risk infants

As reflected in 4.2, clinical identification of high risk infants is lacking. Improved clinical assessment strategies are needed to diagnose and address underlying infant or maternal disease (e.g. HIV, TB), breastfeeding problems that are primarily infant related (e.g. oromotor dysfunction, prematurity, cleft palate), or breastfeeding problems which are primarily mother related (e.g. poor technique, depression). A number of different problems may co-exist in the same infant-carer dyad, or one may be dominant.

To date, tools aiding clinical identification have been mainly focused on older age groups. An 'appetite test' equivalent – used in CMAM triage – is needed for infants <6m. A validated breastfeeding assessment tool would help enable this. A priority is to identify very high risk infants with immediate risk of death and definite need for inpatient admission and intensive care/monitoring.

4.5   Antibiotic use in infants <6m

All current guidelines recommend empirical antibiotics for infants and children with SAM. Key informants indicated this was an area of uncertainty. Thus the evidence base for antibiotics to use in infants <6m was explored.

A literature review was undertaken to look at all studies reporting on the prevalence of bacterial infection in malnourished infants <6m. Differentiating urinary tract infections (UTI), pneumonia and septicaemia, we examined all available data on causative organisms and antibiotic sensitivity patterns.

Findings
- Most studies identified were old and few focused exclusively on malnutrition. Only one study reported on infants <6m; the rest presented aggregate data on infants and children of varying ages and varying nutritional status.

- Prevalence of *urinary tract infection* (UTI) in 14 studies ranged from 3.3-38%. Prevalence of *pneumonia* in 10 studies ranged from 11-63%.

- Prevalence of *bacteraemia* ranged from 5.5-36%. Outcomes in malnourished children with bacteraemia were poor.

- Younger children were more at risk of bacteraemia in one study, children <1 year having a relative risk of 1.77 (95% CI 1.43-2.18) of bacteraemia compared to older children.

- Of the studies reviewed, median in vitro sensitivity of isolates was 24% for amoxicillin, 25% for ampicillin.

Initial results were presented at the CAPGAN meeting (Commonwealth Association of Paediatric Gastroenterology and Nutrition), Malawi, 2009[25]. A full report will be released separately and is available from the MAMI Project group.

Conclusions & Recommendations
The evidence base on anti-microbial treatment specifically for infants <6m is lacking. The evidence base on antimicrobial treatment for malnourished children is also limited. Resistance to amoxicillin is of concern. New trials are needed which use current case definitions of acute malnutrition rather than the heterogenous mix of definitions noted in this review. New evidence is especially vital in settings where HIV is now prevalent.

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[25] http://www.capgan.org/10ccdm.htm

There is a paucity of and a need for intervention studies. Randomised control trials (RCTs) would offer the strongest evidence.

There are likely to be geographical variations. International guidelines on antibiotic use are likely to benefit from local adaptations considering local pathogen prevalence and sensitivity patterns.

4.6   Choice of therapeutic milk

Which therapeutic milk to use has, and continues to be, a key consideration in programmes treating infants <6m. A 2004 WHO consultation on management of SAM[26] recommended that more research on optimal therapeutic milk for infants <6m was needed, due to concerns regarding the renal solute load of full strength F100 in this age-group. The consultation recommended F75 in stabilization of infants <6m, with expressed breastmilk as a possible alternative. During rehabilitation, expressed breastmilk, infant formula or diluted F100 were seen as wise alternatives to standard F100, especially for infants <4m.

The MAMI Project found that diluted F100 was most commonly used by operational agencies in stabilization of infants <6m. During rehabilitation, options used included breastmilk, infant formula and diluted F100.

4.7   HIV

Guidelines for the management of acute malnutrition varied in their coverage of HIV. This may in part reflect different prevalence in different countries.

The contribution of HIV-infected infants and mothers to the burden of nutrition and medical care in feeding programmes is significant in areas of high HIV prevalence. Testing of HIV in infants <6m and early anti-retroviral (ARV) treatment for mothers and infants is beneficial. Cotrimoxazole should be more routinely used, especially if ARVS are not available.

Where malnourished infants <6m present to programmes, risky feeding practices (e.g. replacement feeding where AFASS[27] conditions are not in place) may be a contributing factor. Infant feeding counselling in the context of HIV needs to be consistent with current WHO recommendations[28].

To keep abreast of the latest recommendations in a quickly evolving technical area, local management guidelines should direct to key sources rather than give detailed guidance that may become quickly outdated.

In HIV prevalent populations where infants <6m present acutely malnourished, maternal and infant HIV status is a key concern that should inform management. 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 ARVs for HIV-exposed mothers and infants and safer infant feeding practices are key determinants of HIV-free child survival.

4.8   Individualized feeding management

Current optimal infant feeding recommendations reflect practices that maximize population benefits and risks. They inform but should not limit individual management. Trials to determine the effectiveness of various treatment options in individual management, especially in the 'borderline' age-group (4 to 7 months), are needed. It is important to consider that individualized treatment could send out mixed messages to the wider community on optimal feeding practices. Trials on the appropriate treatment and longer term management of infants with no access to breastmilk are a priority.

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[26] WHO. Severe malnutrition: Report of a consultation to review current literature. Geneva, Switzerland, 06 - 07 September, 2004.
[27] Acceptable, feasible, affordable, sustainable, safe
[28] WHO (2007). World Health Organization, et al., HIV and Infant Feeding: New evidence and programmatic experience. Report of a Technical Consultation held on behalf of the Inter-agency Task Team (IATT) on Prevention of HIV Infections in Pregnant Women, Mothers and their Infants 2007, World Health Organization: Geneva.

5.0 The way forward

The MAMI Project has shown 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 currently struggle using current guidelines to manage this age-group.

Some recommendations are made throughout the MAMI report in response to identified gaps, in particular by highlighting key resources, good practices, and complementary initiatives to consolidate and build on. For example:

*   Existing guidelines with strong MAMI components are MSF guidelines 2006, ACF Assessment and Treatment of Malnutrition, 2002 and IFE Module 2 and are highlighted as good reference tools.

*   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 psychosocial stimulation/support of the infant, the mother-infant dyad and their families.

*   Strategies with potential for effective outpatient-based care of infant <6m 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, BFI, IMCI, and growth monitoring programmes.

*   The MAMI Project findings should inform the update of Sphere Standards, currently underway (due out 2010).

The MAMI findings have also identified key research topics to consider, including:

*   Systematic review of studies of different anthropometric indicators suitable for use in the community in infants 6m, including a review of the suitability of MUAC for this age group.

*   Review of the effectiveness of community-based breastfeeding support to assess its viability as a treatment option for uncomplicated cases of SAM in infants <6m.

*   Review the effectiveness of breastfeeding assessment tools for use in the community to identify 'uncomplicated' and 'complicated' cases of SAM in infants <6m.

*   Develop a triage tool based on a set of clinical signs for 'complicated' cases in need of urgent inpatient treatment.

*   Investigate the nature and effectiveness of skilled breastfeeding counseling and support in inpatient treatment of severely malnourished infants <6m.

*   Research into the choice of therapeutic milk for infants <6m.

*   Studies on the therapeutic treatment and follow-up of malnourished non-breastfed infants.

*   Intervention studies into antibiotics to use in infants <6m and older children.

*   Studies to explore which psychosocial support activities are most effective, and their timing, duration, impact and adaptation to community models for malnutrition treatment.

There are undoubtedly resource implications to strengthened inpatient and expanded outpatient treatment of malnourished infants <6m. This is reflected in reported field experiences but not supported by any cost data. Trials of programme interventions need to include and report on cost to inform programme planning. This is especially important in considering the cost-benefits and viability of scale-up of interventions.

Assessing programme performance treating infant <6m malnutrition needs to be strengthened. Critically performance must capture the clinical, psychosocial and contextual complexity of infants treated, ensure robustness of data and management systems to identify problems which may occur, and establish programme population coverage of SAM/MAM in infants <6m.

Key initiatives that may provide lessons in taking initiatives forward include the SFP minimum reporting standards project (MRP)[29], the Vermont-Oxford Network to improve neonatal care[30], and the rollout of the 1999 WHO guidelines that reflected the importance of addressing management, systems and staff in effective implementation[31].

To enable continued inter-agency dialogue, data sharing and partnership is needed. In particular:
- Focused prospective audits – interpreting retrospective data is challenging and yields relatively limited information.

- Age-disaggregated data collection on infant <6m, currently implemented in the minority of cases, should be rolled out and continue.

- Harmonised databases and coding systems would enable easier audit. In this regard, an update in the MRP to include infants <6m in SFP reporting is recommended.

- A mechanism for data sharing and 'lesson' learning forums should be established to inform future field guidance.

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)[32] might usefully guide which policies and research projects should strongly (and more urgently) be recommended. More resources should be devoted to future guideline development and tools such as GRADE and AGREE used to better enhance their quality.

MAMI strategies should be located within a framework of safe and appropriate IYCF; programme synergies between IYCF support of infants <6m and child 6-24m must be better reflected in the guidelines. Locating interventions to treat infant and child malnutrition within global policy frameworks, e.g. the WHO/UNICEF Global Strategy on IYCF, creates opportunities to coordinate with governments and national level plans and to synergise interventions that treat malnutrition with those that seek to prevent it. Such strategic approaches may be possible in many emergency contexts.

Of most immediate concern is the lack of explicit consideration to infants <6m in current guidelines or their explicit recognition in recent statements on malnutrition treatment[33] and 2006 WHO-GS rollout[34,35]. This risks the presumption that care for older children can safely be extended to infants <6 months 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 immediate term*. Such a statement would be well placed as an output of 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. A move towards community-based management of acute malnutrition in infants <6m is an option that should be actively considered. Further applied and operational research is required to provide the evidence base for such a transition. 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 best to improve nutritional, clinical and public health outcomes in infants <6m.

[29] For details, visit www.ennonline.net/research
[30] http://www.vtoxford.org/home.aspx
[31] Puoane et al, 2008. Why do some hospitals achieve better care of severely malnourished children than others? Five-year follow-up of rural hospitals in Eastern Cape, South Africa. HPP 2008;23(6):428-37.
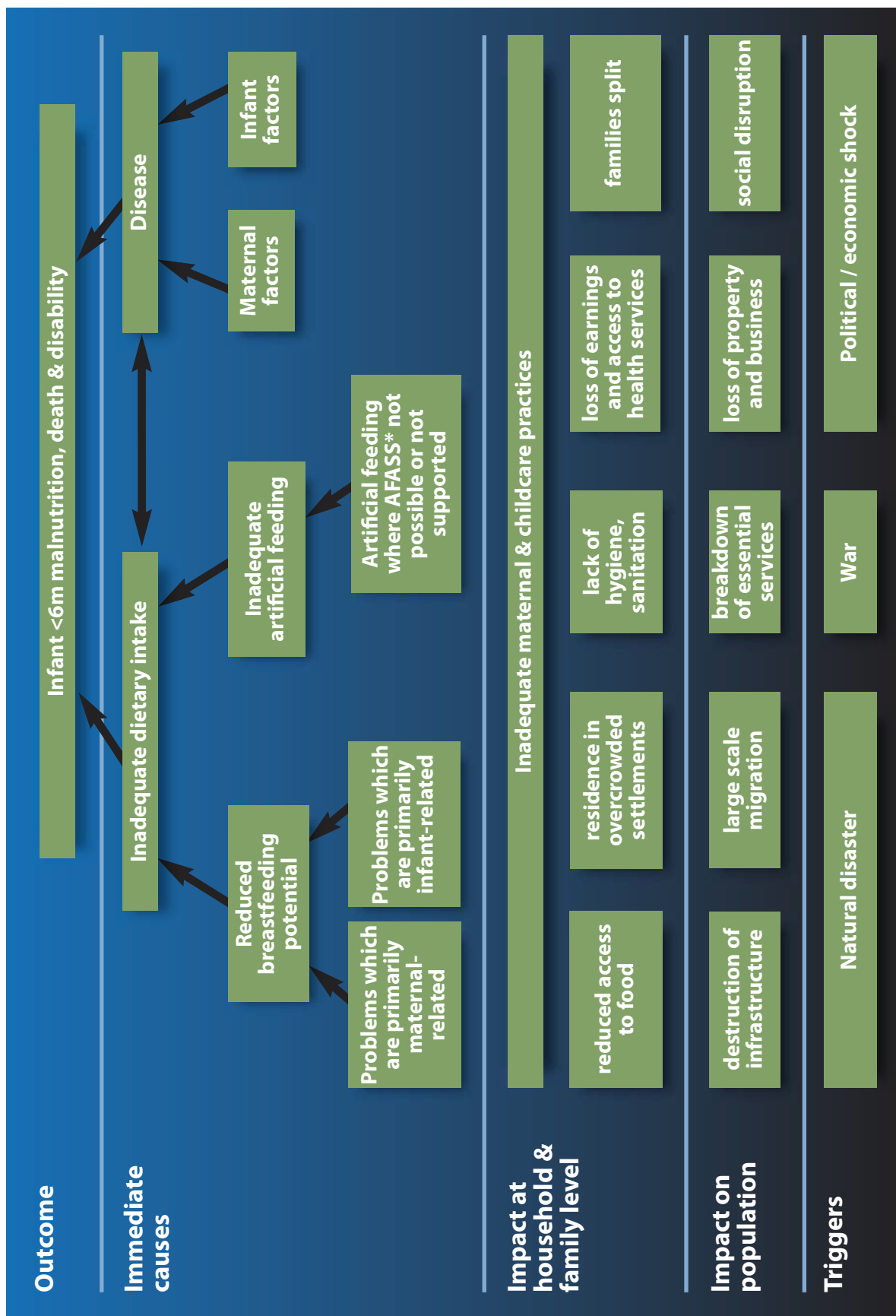[32] http://www.chnri.org
[33] Community-based management of severe acute malnutrition A Joint Statement by WHO, WFP, the UNSCN and UNICEF. http://www.who.int/nutrition/topics/statement_commbased_malnutrition/en/index.html
[34] WHO Child Growth Standards and the identification of severe acute malnutrition in infants and children. A Joint Statement by WHO and UNICEF. http://www.who.int/entity/nutrition/publications/severemalnutrition/9789241598163_eng.pdf
[35] IASC Global Nutrition Cluster, and Standing Committee on Nutrition (SCN) Task Force on Assessment, Monitoring, and Evaluation. Fact sheet on the implementation of 2006 WHO Child Growth Standards for emergency nutrition programmes for children aged 6-59 months. March 2009.
http://oneresponse.info/GlobalClusters/Nutrition/publicdocuments/WHO%20GS%20Factsheet%20English.pdf

Appendix A   Conceptual framework of causes of malnutrition in infants <6m

Outcome

Immediate causes

Impact at household & family level

Impact on population

Triggers

Infant <6m malnutrition, death & disability

Disease

Infant factors

Maternal factors

Inadequate dietary intake

Inadequate artificial feeding

Artificial feeding where AFASS* not possible or not supported

Reduced breastfeeding potential

Problems which are primarily infant-related

Problems which are primarily maternal-related

Inadequate maternal & childcare practices

reduced access to food

residence in overcrowded settlements

lack of hygiene, sanitation

loss of earnings and access to health services

families split

destruction of infrastructure

large scale migration

breakdown of essential services

loss of property and business

social disruption

Natural disaster

War

Political / economic shock

*acceptable, feasible, affordable, sustainable and safe conditions

Appendix B   Key Resources

Online links are provided to electronic versions where available. All resources listed are also located at
www.ennonline.net/resources and select 'MAMI'

ACF Assessment and Treatment of Malnutrition in Emergency Situations, Claudine Prudhon, 2000 *(Book available for purchase via http://www.aahuk.org/publications.htm)*

IFE Core Group (2009) Infant Feeding in Emergencies Orientation Package (Module 1), updated 2009. *(Download free from http://www.ennonline.net/resources/view.aspx?resid=1)*

IFE Core Group (2007) Infant feeding in emergencies. Module 2. Version 1.1 Developed through collaboration of ENN, IBFAN-GIFA, Fondation Terre des hommes, UNICEF, UNHCR, WHO, WFP. Core Manual (for training, practice and reference). English and French. *(Download free http://www.ennonline.net/resources/view.aspx?resid=4 or in print from ENN, Oxford, UK or UNHCR, Nairobi) or in print from ENN, Oxford, UK or UNHCR, Nairobi)*

IFE Core Group (2007) Operational Guidance on IFE, version 2.1, May 2007. 11 languages. *(Download free from http://www.ennonline.net/resources/view.aspx?resid=6)*

International Code of Marketing of Breastmilk Substitutes (1989) *(Available at http://www.who.int/nutrition/publications/code_english.pdf)*

MSF Nutrition Guidelines 2006 *(Download from http://www.msf.org.uk/books.aspx)*

Sphere Humanitarian Charter & Minimum Standards in Disaster Response (2004) *http://www.sphereproject.org/*

Valid International (2006) International. Community-based Therapeutic Care (CTC). A Field Manual. Oxford: Valid International. *(Available at http://www.fantaproject.org/ctc/manual2006.shtml)*

WHO/UNICEF (2003) Global Strategy on Infant and Young Child Feeding. Geneva: World Health Organisation. *(Available at http://www.who.int/nutrition/publications/infantfeeding/9241562218/en/index.html)*

WHO (2003) Training course on the management of severe malnutrition. Geneva: World Health Organisation. *(Available at http://www.who.int/nutrition/topics/severemalnutrition_training_courses/en/index.html)*

WHO (2004) Severe malnutrition: report of a consultation to review current literature. Geneva, World Health Organization, 6-7 September 2004. *(Available at http://www.who.int/nutrition/publications/malnutrition/en/index.html)*

WHO (2004) Guiding Principles for feeding infants and young children during emergencies *(Available at http://www.who.int/nutrition/publications/emergencies/9241546069/en/index.html)*

WHO (1999) Management of severe malnutrition: a manual for physicians and other senior health workers. World Health Organisation. Geneval: World Health Organisation. *(Available at http://www.who.int/nutrition/publications/malnutrition/en/index.html)*

WHO (2003) Guidelines for the inpatient treatment of severely malnourished children. Geneva: World Health Organisation. *(Available at http://www.who.int/nutrition/publications/malnutrition/en/index.html)*

WHO & UNICEF (2009) WHO child growth standards and the identification of severe acute malnutrition in infants and children. A joint statement by the World Health Organization and the United Nations Children's Fund. *(Available at http://www.unicef.org/nutrition/files/stmt_child_growth_sam_final.pdf)*

World Health Organization. The WHO child growth standards. *(Available at: http://www.who.int/childgrowth/standards/en/)*

WHO, WFP & UNICEF (2007) Community-based management of severe acute malnutrition. A Joint Statement by the World Health Organization, the World Food Programme, the United Nations System Standing Committee on Nutrition and the United Nations Children's Fund. *(Available at http://www.who.int/nutrition/topics/statement_commbased_malnutrition/en/index.html)*

UNICEF, UNAIDS, WHO, UNFPA (2003). HIV and infant feeding. A guide for health-care managers and supervisors. *(Available at http://www.who.int/child-adolescent-health/publications/NUTRITION)*

WHO (2007). HIV and Infant Feeding: Update based on the Technical Consultation held on behalf of the Inter-agency Task Team (IATT) on Prevention of HIV Infection in Pregnant Women, Mothers and their Infants. Geneva, 25–27 October 2006

UNHCR, June (2009) Guidance on infant feeding and HIV in the context of refugees and displaced populations. *(Available at http://www.ennonline.net/resources)*

WHO, UNICEF (2009) Acceptable medical reasons for using breastmilk substitutes. *http://whqlibdoc.who.int/hq/2009/WHO_FCH_CAH_09.01_eng.pdf*

WHO UNICEF (2006). Integrated IYCF Counselling Course. Trainers Guide. *(Available at http://www.ennonline.net/resources)*

CARE, URC, CHS (2007). Infant and Young Child Feeding Counselling - Community Focused Approach. Trainers Guide. *(Available at http://www.ennonline.net/resources)*

ENN/IFE Core Group (2009). Integration of IYCF support into CTC/CMAM. Facilitators Guide and handouts. ENN, IFE Core Group & collaborators. October 2009. *(Available at http://www.ennonline.net/resources)*