

Chapter 2 *Setting the scene*

Chapter 2: Setting the scene

This chapter sets the context of the MAMI Project. It opens with an explanation of the importance of infants and malnutrition as a global public health priority. It explores reasons why infants <6m are an age group of particular significance. The chapter also lays out the policy framework for infant and young child feeding (IYCF) in emergencies. Finally the chapter seeks to define acute malnutrition and describe the context of emergency selective feeding programmes where MAMI is typically located.

2.1 Infants and Malnutrition: A Global Public Health Priority

Around 9.2 million children under the age of five years die each year¹², mostly from preventable causes and mostly in poor countries¹³. Generally the younger the children the more vulnerable they are; nearly 70% of under five deaths occur in the first year of life and 38% of under one year deaths occur in the first month of life¹⁴. Diarrhoea and pneumonia are the most significant infections causing death, accounting for about 20% each¹⁵.

Child malnutrition is a major global public health problem. The 2008 Lancet Nutrition Series estimated that in developing countries, out of 555 million children age 0 to five years¹⁶:

177 million (95%CI 163 to 193) or 32.0% are stunted (chronic malnutrition)
112 million (95%CI 99 to 126) or 20.2% are underweight (mixed malnutrition)
19 million (95%CI 10 to 29) or 3.5% are severely wasted (acute malnutrition)
Maternal and child undernutrition is responsible for 35% of child deaths
Malnutrition is responsible for 11% of total global disease burden.

The vulnerability of infants and young children to malnutrition, illness and death is heightened in emergencies. An emergency can be defined as “any situation where there is an exceptional and widespread threat to life, health and basic subsistence, which is beyond the coping mechanisms of individuals and the community” (Oxfam Humanitarian Policy, 2003). Mortality rates and nutritional status of children under five years are often used as an indicator of the state of crisis of such a population. Infants and young children contribute greatly to the malnutrition caseload. For example, in a large-scale therapeutic feeding programme in Niger in 2005, 95% of the 43,529 malnourished cases admitted for therapeutic care were children less than two years of age¹⁷.

Infant and young child feeding practices are a key determinant of vulnerability to malnutrition, disease and death. The recent Lancet series on Maternal and Child Undernutrition¹⁸ reinforced the importance of breastfeeding and complementary feeding in saving lives of children under five years of age. Breastfeeding support tops the table of life-saving interventions: 13% of under five deaths could be saved through exclusive and continued breastfeeding until one year of age and another 6% through appropriate complementary feeding¹⁹. The significance of feeding practice is greatest with the youngest; one-fifth (22%) of all neonatal deaths could be prevented by early initiation of exclusive breastfeeding (breastfeeding within the first hour)²⁰. Recommendations on optimal infant and young child feeding practices reflect this, aiming to maximise health and minimise morbidity and mortality (See Box 1).

2.2 Significance of infants <6m

Box 1: Optimal infant and young child feeding practices

Early initiation of breastfeeding: introducing breastfeeding within one hour of birth²¹.

Exclusive breastfeeding: an infant receives only breastmilk for the first six months of life and no other liquids or solids, not even water, with the exception of necessary vitamins, mineral supplements or medicines²².

Continued breastfeeding: sustaining breastfeeding to two years of age or beyond²³.

Complementary feeding: age-appropriate, adequate and safe solid or semi-solid food is provided in addition to breastmilk. The complementary feeding period is six months to two years. Appropriate complementary foods are those that provide sufficient energy, protein and micronutrients to meet the child's growing nutritional needs²⁴.

Infant and young child feeding in the context of HIV is an added challenge in emergency contexts:

"The HIV pandemic and the risk of mother-to-child transmission of HIV through breastfeeding pose unique challenges to the promotion of breastfeeding, even among unaffected families. Complex emergencies, which are often characterized by population displacement food insecurity and armed conflict, are increasing in number and intensity, further compromising the care and feeding of infant and young children the world over".

Global Strategy for Infant and Young Child Feeding. UNICEF/WHO, 2003.

Feeding practices are a key determinant of HIV-free child survival and an important MAMI consideration (See Chapter 9).

2.2 Significance of infants <6m

2.2.1 Infants <6m are unique

Just as a child is not merely a small adult, an infant <6m is not merely a small child. There are several reasons for considering infants <6m as a unique subgroup:

Feeding differences

Infants <6m are unique in their dependence on breastfeeding (or a breastmilk substitute in non-breastfed infants) to meet all their fluid and nutrient needs. The mother (or maternal substitute) is thus critical to his/her nourishment. This dependence on breastfeeding for survival and the challenges of managing infants where breastfeeding or breastmilk is not available have immense practical implications for the management of acute malnutrition in this age-group.

Physiological and developmental differences

Maturation, growth and development are not simple linear processes. Birth and the immediate weeks and months after birth are a time of significant change. The developmental changes of an infant between one month and four months of age are vast compared to a period of the same length in an older infant. Different infants mature at different rates, so that 'normal' progress encompasses wide differences in timing. Lucas and Zlotkin summarise the main nutrition relevant changes between 0 and six months as:²⁵

- **Mechanical:** Neuromotor development, which permits coordinated sucking, swallowing and, later on, chewing of more solid foods.
- **Physiological:** Changes in motor, digestive and absorptive functions of the gut, kidneys and other organs that equip the infant for postnatal feeding.
- **Biochemical:** Changes in enzyme activity and biochemical pathways that enable the infant to survive as an independent organism after birth, when the transplacental supply of glucose and other nutrients from the mother suddenly ceases at birth.
- **Protective:** Particularly developments in immune functions and the mucosal barrier of the gut that occur as food related exposure to potentially pathogenic organisms and antigens occurs postnatally.

These reflect how the period 0 to <6m is period of unprecedented change, and consequently, of both opportunity and risk.

2.2 Significance of infants <6m

Pathological differences

Because of underlying physiological differences and exposures, infants <6m also suffer from a different range of pathologies compared to older children:

- Some are different but overlap with older children, e.g. many bacterial infections occur at all ages but some are more common in certain ages than others.
- Some conditions are unique to infants <6m, e.g. certain types of congenital heart disease may not be compatible with life much beyond birth.
- Some conditions are relatively rare in infants, e.g. severe allergic reactions to food.

Mortality risk differences

Younger infants are at greater risk of death than older children. Feeding practices in infants <6m are intimately associated with mortality in this age group, even in non-emergencies. A pooled analysis of statistics from developing countries found that not being breastfed increases the risk of mortality by six times in infants less than two months old, compared to 1.4 times in infants between nine and 11 months of age²⁶. Malnutrition increases this risk further, a reflection of the interaction between nutritional status and disease (see Figure 1). For example, in a therapeutic feeding programme in Afghanistan, the mortality rate was 17.2% amongst malnourished infants <6m admitted for therapeutic care compared to 12% in six to 11 month olds and 8.3% in 12 to 17 month olds (see Figure 2).²⁷

Figure 1: Interactions between malnutrition and disease

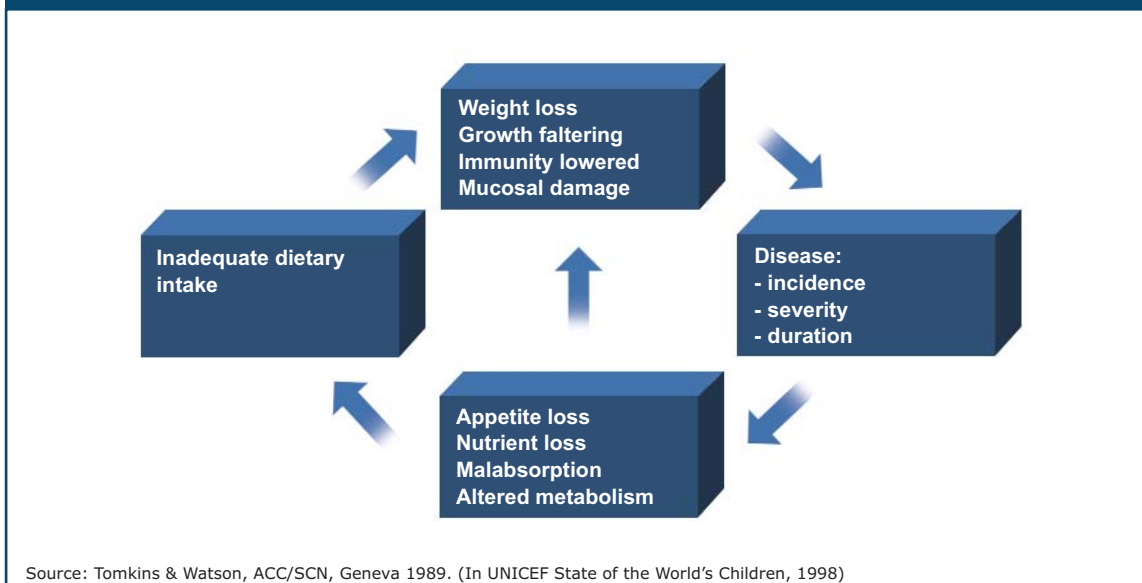
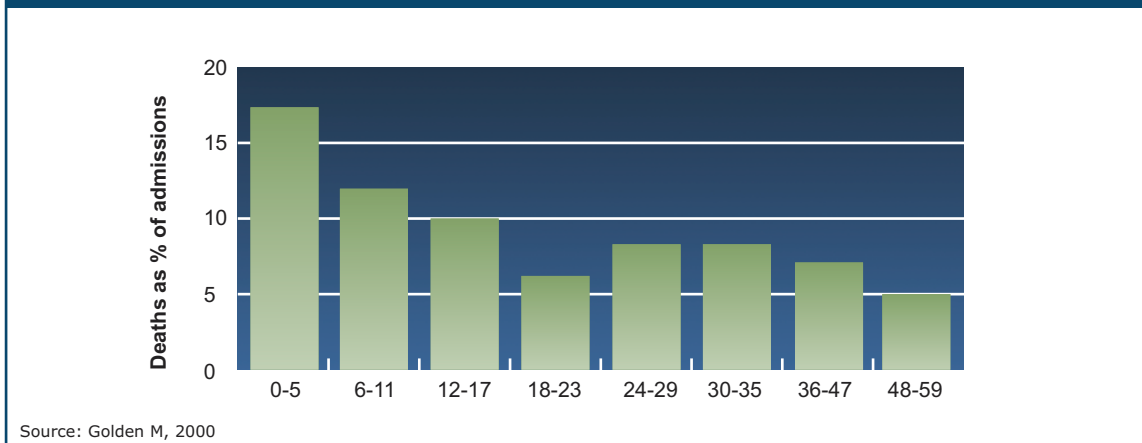


Figure 2: Bar chart showing deaths by age group in a feeding programme in Kabul



2.2 Significance of infants <6m

Impact of Low birth weight

For infants <6m, birth is a more recent event in their life cycle and related issues can have a much more immediate impact. Low birth weight (LBW) (<2500g) can be a consequence of preterm birth (before 37 weeks completed gestation) or being small for gestational age (SGA) (weight-for-gestation <10th percentile), or both. Some infants can also have underlying intra-uterine growth retardation (IUGR), which is not necessarily synonymous with birth weight.²⁸ Risks associated with each of these vary. In practice, it is often only possible to determine birth weight (and often not even that in many in many developing countries), and therefore all LBW infants are treated as one group.

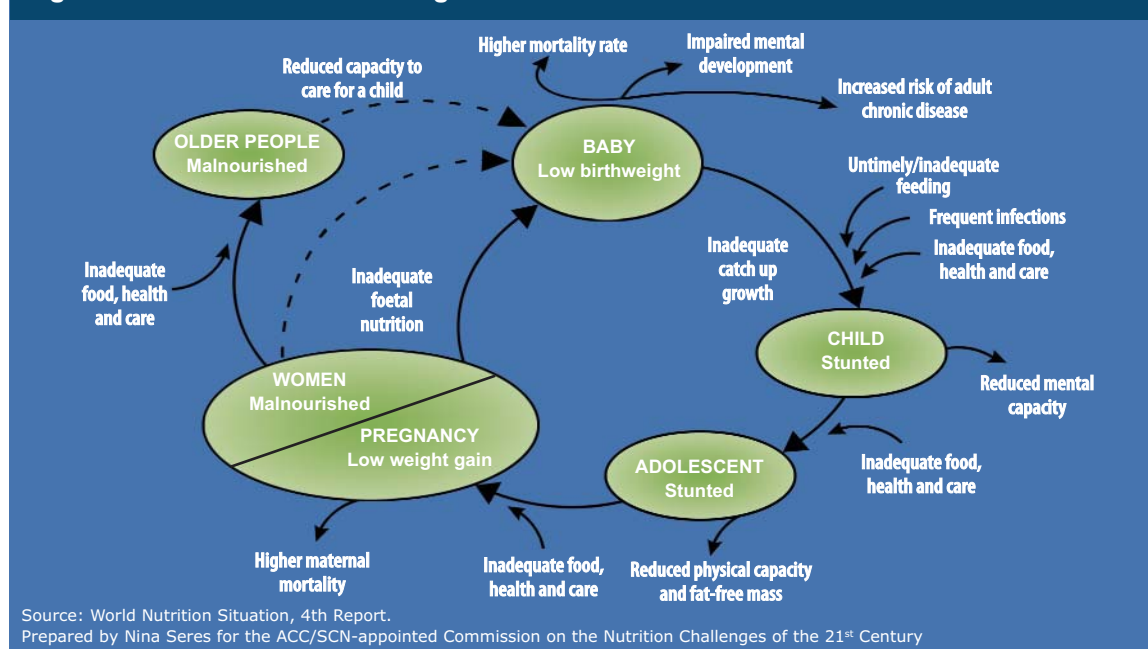
Whether or not infants admitted for malnutrition treatment are LBW is important to MAMI since:

- LBW infants have an elevated mortality risk compared to same age normal birth weight infants
- LBW may confound and complicate the diagnosis of acute malnutrition
- LBW infants sometimes require different or additional treatments. Optimal feeding of LBW infants is reviewed in detail in a 2006 WHO technical review.²⁹

2.2.2 Long term implications of infant <6m malnutrition

Studies show clear links between early life environment and risk of ill health later in life.³⁰ The period 0 to six months is part of a critical 'window of opportunity', within which the impact of undernutrition has far reaching implications³¹. These are manifested at the individual level at all stages of life (Figure 3) and at the population level through the observed 'dual burden' of malnutrition disease^{32,33,34}. The latter is often observed in settings of societal, demographic and nutritional transition. Individuals experiencing undernutrition in early life may later be exposed to nutrient excess. This appears to have particularly adverse effects.^{35,36,37,38}. Adaptive metabolic responses of conserving and storing developed early on become maladaptive later on when there is chronic excess of food. Increased rates of obesity and related conditions such as coronary heart disease, hypertension, stroke and diabetes result. Optimal nutrition of infants <6m therefore makes a key contribution to health throughout the life cycle.

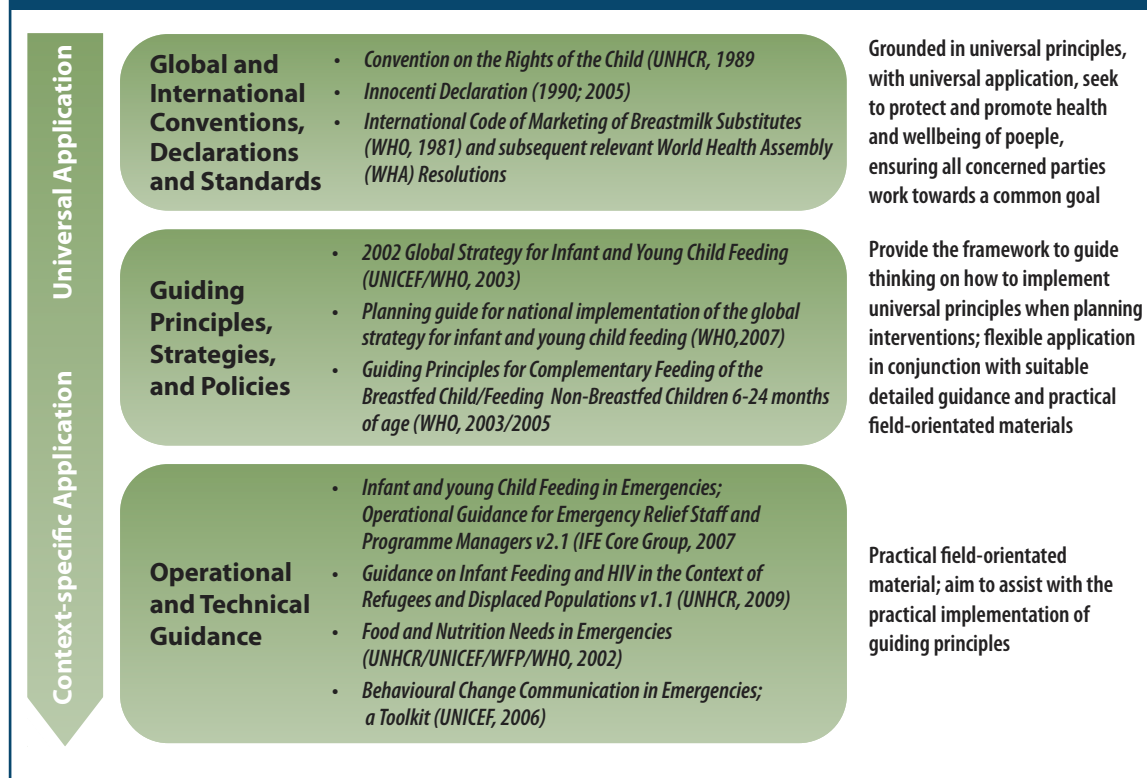
Figure 3: Life course and inter-generational effects of malnutrition



2.3 Global strategies, policy and guidance on IFE

The protection and support of optimal infant and young child feeding (IYCF) is mandated by international law. It is necessary for meeting international standards and is regulated and detailed in operational and technical guidance. Figure 4 reflects a schematic overview of key documentation relevant to the protection and support of IYCF in emergencies (IFE), with some examples of each. Several of these are particularly relevant to MAMI and are described here in more detail.

Figure 4: Key strategies, policies and guidance related to infant and young child feeding in emergencies



WHO/UNICEF Global Strategy Infant and Young Child Feeding (2002)

The WHO/UNICEF Global Strategy on Infant and Young Child Feeding³⁹ is an international strategic framework based on respect, protection, facilitation and fulfillment of accepted human rights principles. It was adopted by consensus in 2002 by all WHO Member States. The Global Strategy identifies the obligations and responsibilities of governments, organisations, and other concerned parties to infants and young children and sets operational targets. The Implementation Handbook for the Convention of the Rights of the Child recognizes the Global Strategy as a cornerstone to achieving the child's right to the highest attainable standard of health, stipulated in Article 24 of the Convention.

Of particular note to MAMI, the Global Strategy calls for appropriate feeding support for infants and young children in 'exceptionally difficult circumstances'; related support for caregivers and the development of the knowledge and skills base of health workers working with carers and children in such situations. 'Exceptionally difficult circumstances' includes infants of low-birth-weight, mothers who are HIV-infected and infants in emergency situations.

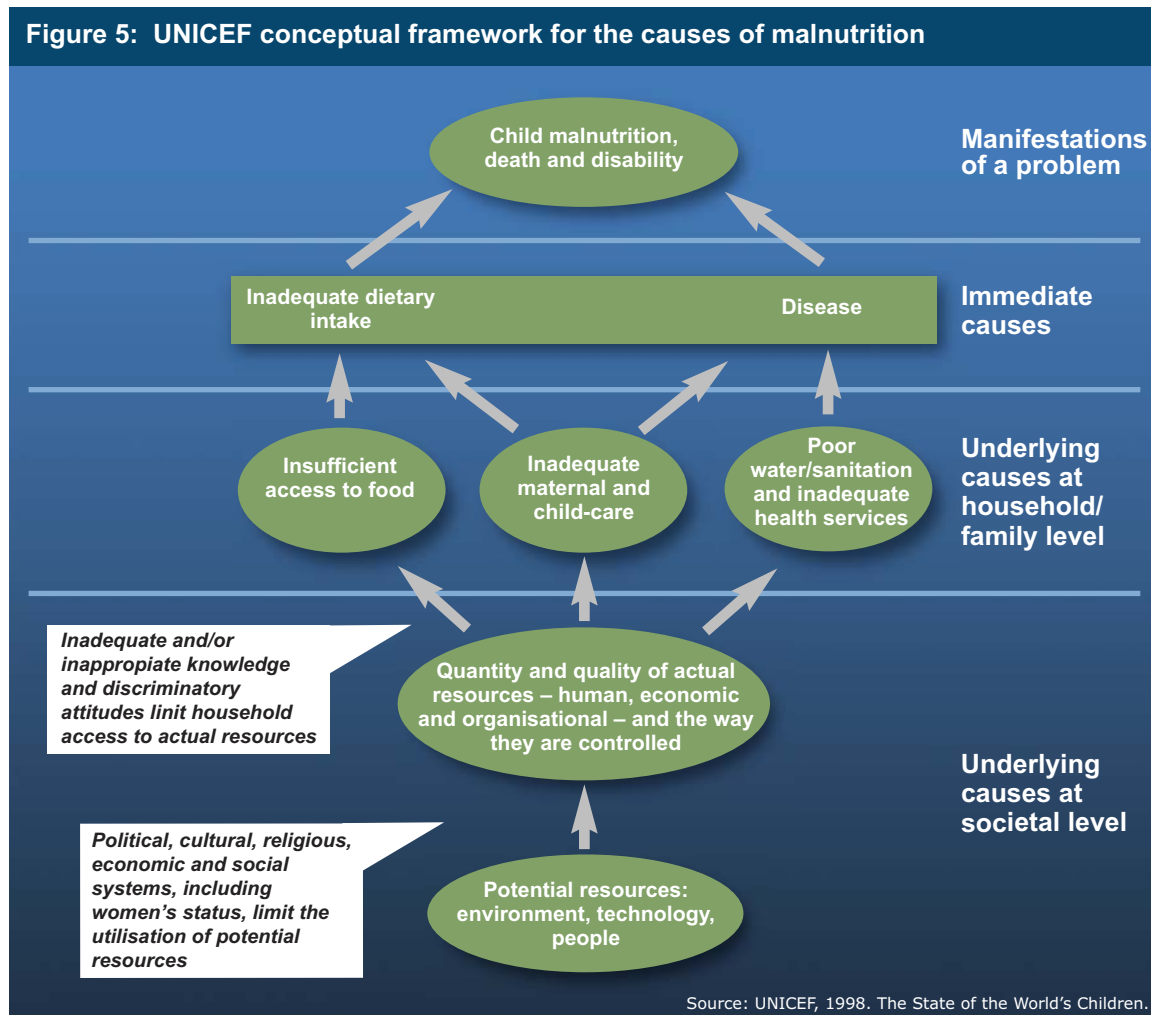
Many of the WHO Member States are already acting on their official commitment to implement the Global Strategy, and are developing national action plans based on it. Positioning interventions to treat malnutrition within the Global Strategy creates opportunities to coordinate with governments and national level plans.

2.3 Global strategies, policy and guidance on IFE

UNICEF Conceptual framework for the causes of malnutrition (1990)

The UNICEF Conceptual framework for the causes of malnutrition⁴⁰ was first developed in 1990 to guide analysis of the causes of malnutrition in a given context. Refined versions have since been produced though retaining the basic elements of the original (see Figure 5). It has been applied widely to emergency contexts. The UNICEF framework reflects how malnutrition results from a complex mix of factors at different levels. It recognises the role of IYCF and care practices. Understanding the many different influences on nutritional status and underlying causes of malnutrition in a particular context allows the development of appropriate interventions to address malnutrition and can help to transition emergency interventions into longer term development programming. This framework formed the basis of a version developed for MAMI (see Section 1.4).

Figure 5: UNICEF conceptual framework for the causes of malnutrition



Millennium Development Goals (2000)

The Millennium Development Goals (MDGs) are eight goals to be achieved by 2015 that respond to the world's main development challenges⁴¹. The benefits of treating acute malnutrition and of optimal IYCF are relevant to all eight of the United Nations Millennium Development Goals (MDGs)^{42,43} (see Table 1). At mid-point towards the 2015 deadline, progress towards some of the MDGs is off track in some regions, and MDGs 4 and 5 are particularly in danger of not being met. Improvements in MAMI will increase the changes for achievement of these MDGs.

2.3 Global strategies, policy and guidance on IFE

Table 1: Contribution of malnutrition treatment and optimal IYCF to meeting Millennium Development Goals (MDGs)

	Treatment of acute malnutrition	Optimal IYCF ⁴⁴
MDG 1 (Eradicate extreme poverty and halve hunger)	Malnutrition treatment directly addresses hunger.	Breastfeeding is a low cost, high quality, safe food which is key to infant and child nutrition. ^{45,46}
MDG 2 (Universal primary education)	Malnutrition impairs school performance. ⁴⁷	Breastfeeding and appropriate complementary feeding contribute to optimal neurological and cognitive development. ^{48,49}
MDG 3 (Gender equality)	Malnourished girls are less likely to stay in school and receive the education so vital to their empowerment. ⁵⁰	Breastfeeding enables an equal start ⁵¹ and empowers women through health and reproductive benefits, e.g. birth spacing. ⁵²
MDG 4 (Reduce child mortality).	Maternal and child undernutrition contributes to 35% of under five deaths. ⁵³	If all infants were exclusively breastfed for six months and were breastfed for one year, under five mortality would reduce by about 14%. If appropriate complementary feeding were given to children between six months and two years under five mortality would reduce by about 6%. ⁵⁴
MDG 5 (Maternal Health)	Malnourished girls not reaching their full adult physical potential are at increased risk of maternity-related problems. ⁵⁵	The Global Strategy draws attention to maternal nutritional and social needs related to IYCF ⁵⁶ , and maternal benefits, such as reduced post-partum haemorrhage through early initiation of breastfeeding, protection from anaemia and maternal depletion through lactational amenorrhoea. ^{57,58,59}
MDG 6 (Combat HIV/AIDS, malaria & other diseases)	Nutrition and infection interact. ^{60,61}	Optimal IYCF practices reduce morbidity and mortality in children. ^{62,63}
MDG 7 (Ensure environmental sustainability)	Initiatives to prevent malnutrition or intervene early, reduce the need for external supports that may have higher environmental impact, e.g. importing specialised products, less transport costs, less waste.	Breastfeeding is a sustainable, locally available feeding option without waste, packaging or fuel use. ^{64,65}
MDG 8 (global partnerships for development)	The Global Strategy framework, for example, offers an opportunity to develop global partnerships for development. ⁶⁶	

International Code of Marketing of Breastmilk Substitutes (1981)

Upholding the provisions of the International Code of Marketing of Breastmilk Substitutes⁶⁷ and subsequent relevant World Health Assembly (WHA) resolutions (collectively known as 'the Code')⁶⁸ is a key consideration in any interventions that involve infant and young child feeding. All provisions of the Code apply in emergencies and adoption of and adherence to the Code in its entirety is a minimum requirement of member states (WHA 34.22). At least 48 countries have national legislation based on the Code.

The Code is intended to protect the mothers/caregivers of both breastfed and non-breastfed infants and young children from commercial influences on their infant feeding choices. The Code sets out the responsibilities of the infant food industry, health workers, governments and organizations in relation to the marketing of breastmilk substitutes, feeding bottles and teats. The Code does not ban the use of infant formula or bottles but controls how they are produced, packaged, promoted and provided.

WHO Guiding Principles for feeding infants and young children during emergencies (2004)

Published in 2004, the WHO Guiding Principles for feeding infants and young children during emergencies⁶⁹ emphasises both optimal infant and young child feeding practices and the recognition and treatment of acute malnutrition, detailed in ten guiding principles and summarised here (Box 3).

2.3 Global strategies, policy and guidance on IFE

Box 2: Breastmilk substitute definition (the Code)

For the purpose of the Code, *breastmilk substitutes* are defined as “any food being marketed or otherwise represented as a partial or total replacement of breastmilk, whether or not suitable for that purpose.”

A common breastmilk substitute is commercial infant formula, a product that should meet technical specifications of the relevant Codex Alimentarius Standards. However, any product promoted for use in an infant under six months of age (or represented as a replacement for breastmilk from six months of age to two years or beyond), is considered a breastmilk substitute for the purpose of the Code and so fall within its scope.

Examples of products that may fall within the scope of the Code include milk products such as dried skimmed milk and condensed milks, therapeutic milks, bottled water, juices, teas, glucose solutions, cereals, ready to use therapeutic foods and any other foods and fluids marketed for infants under six months.

Box 3: Guiding principles for feeding infants and young children during emergencies (WHO, 2004)

Principle 1

Infants born into populations affected by emergencies should normally be exclusively breastfed from birth to 6 months of age.

Principle 2

The aim should be to create and sustain an environment that encourages frequent breastfeeding for children up to two years or beyond.

Principle 3

The quantity, distribution and use of breast-milk substitutes at emergency sites should be strictly controlled.

Principle 4

To sustain growth, development and health, infants from 6 months onwards and older children need hygienically prepared, and easy-to-eat and digest, foods that nutritionally complement breast milk.

Principle 5

Caregivers need secure uninterrupted access to appropriate ingredients with which to prepare and feed nutrient-dense foods to older infants and young children.

Principle 6

Because the number of caregivers is often reduced during emergencies as stress levels increase, promoting caregivers' coping capacity is an essential part of fostering good feeding practices for infants and young children.

Principle 7

The health and vigour of infants and children should be protected so they are able to suckle frequently and well and maintain their appetite for complementary foods.

Principle 8

Nutritional status should be continually monitored to identify malnourished children so that their condition can be assessed and treated, and prevented from deteriorating further. Malnutrition's underlying causes should be investigated and corrected.

Principle 9

To minimize an emergency's negative impact on feeding practices, interventions should begin immediately. The focus should be on supporting caregivers and channelling scarce resources to meet the nutritional needs of the infants and young children in their charge.

Principle 10

Promoting optimal feeding for infants and young children in emergencies requires a flexible approach based on continual careful monitoring.

2.3 Global strategies, policy and guidance on IFE

Sphere Humanitarian Charter & Minimum Standards in Disaster Response (2004)

During the past decade the humanitarian community has initiated a number of inter-agency initiatives to improve accountability, quality and performance in humanitarian action. Launched in 1997, the Sphere Project⁷⁰ is one such initiative. The Sphere Project comprises a humanitarian charter and a set of standards that specify the minimum acceptable levels to be attained in humanitarian response. The Sphere 2004 edition provides 17 minimum standards in food security, nutrition and food aid. Each minimum standard has a set of key indicators to signal how far the standard has been attained⁷¹.

There are a number of Sphere indicators that are particularly relevant to infants <6m, for example indicators on exclusive breastfeeding, support to non-breastfed infants and support to pregnant and lactating women. Greater clarity is needed on how such indicators can be measured, and generally around MAMI, for example, criteria for admissions of infants <6m. An update of Sphere is currently underway (2010 edition) and the MAMI Project is contributing to this process.

Operational Guidance on IFE (2007)

One of the challenges of meeting global recommendations is how to translate them into practical action. Global instruments typically do not include detailed instruction on action required, a point highlighted in the recent Lancet Series on Maternal and Child Undernutrition:

“The international system... provides much normative guidance on nutrition policy, but some of it is expressed in abstract language that does not easily translate into implementation⁷².

Lancet Maternal and Child Undernutrition Study Group, Jan 2008.

The Operational Guidance on IFE for emergency relief staff and programme managers (Ops Guidance on IFE)⁷³ is a concise policy guidance that moves towards operationalising global recommendations on IYCF for the emergency context. Mandated by global positions it draws on technical guidance, empirical evidence, and experience from past emergencies. Produced by the IFE Core Group, and ‘housed’ at ENN, the Ops Guidance on IFE is managed as a living document and supported by a range of UN agencies, NGOs and bilateral donors. Key points of the Operational Guidance on IFE are included in Box 4.

2.4 Definition of Acute Malnutrition

Box 4: Key Points of the Operational Guidance on IFE

1. Appropriate and timely support of infant and young child feeding in emergencies (IFE) saves lives.
2. Every agency should develop a policy on IFE. The policy should be widely disseminated to all staff, agency procedures adapted accordingly and policy implementation enforced.
3. Agencies should ensure the training and orientation of their technical and non-technical staff in IFE, using available training materials.
4. Within the United Nations (UN) Inter-agency Standing Committee (IASC) cluster approach to humanitarian response, UNICEF is likely the UN agency responsible for co-ordination of IFE in the field. Also, other UN agencies and NGOs have key roles to play in close collaboration with the government.
5. Key information on infant and young child feeding needs to be integrated into routine rapid assessment procedures. If necessary, more systematic assessment using recommended methodologies could be conducted.
6. Simple measures should be put in place to ensure the needs of mothers, infants and young children are addressed in the early stages of an emergency. Support for other caregivers and those with special needs, e.g. orphans and unaccompanied children, must also be established at the outset.
7. Breastfeeding and infant and young child feeding support should be integrated into other services for mothers, infants and young children.
8. Foods suitable to meet the nutrient needs of older infants and young children must be included in the general ration for food aid dependent populations.
9. Donated (free) or subsidised supplies of breastmilk substitutes (e.g. infant formula) should be avoided. Donations of bottles and teats should be refused in emergency situations. Any well-meant but ill-advised donations of breastmilk substitutes, bottles and teats should be placed under the control of a single designated agency.
10. The decision to accept, procure, use or distribute infant formula in an emergency must be made by informed, technical personnel in consultation with the co-ordinating agency, lead technical agencies and governed by strict criteria.
11. Breastmilk substitutes, other milk products, bottles and teats must never be included in a general ration distribution. Breastmilk substitutes and other milk products must only be distributed according to recognised strict criteria and only provided to mothers or caregivers for those infants who need them. The use of bottles and teats in emergency contexts should be actively avoided.

Extracted from: Operational Guidance on IFE, v2.1, 2007

2.4 Definition of Acute Malnutrition

In selective feeding programmes anthropometric measurements, namely weight and height, are typically used to identify and classify the degree of acute malnutrition. This helps to identify those requiring nutritional care.⁷⁴ Presence of bilateral oedema indicates nutritional oedema or 'kwashiorkor' that is classified as severe acute malnutrition, independent of weigh-for-height.

2.4.1 Case definitions of acute malnutrition

WHO case definitions of acute malnutrition (1999)⁷⁵ are the basis of almost all current national and international protocols managing acute malnutrition (See Table 2).

2.4 Definition of Acute Malnutrition

Table 2: WHO classification of acute malnutrition, 1999

	Classification	
	Moderate acute malnutrition (MAM)	Severe acute malnutrition (SAM)
Nutritional oedema (symmetrical)	No	Yes
Weight-for-Height	-3 ≤ Z-score < -2 (NCHS)** (or 70- 79% of median NCHS)*	Z-score < -3 (NCHS)** (or <70% of median NCHS)*

* **Weight-for-height percent of median (WHM)** is the ratio of the measured value in the individual to the median value of the reference data.
 ** **Weight-for-height Z-scores (WHZ)** are where -1 z-score is 1 standard deviation (SD) below the growth 'norm' median and +1 Z is 1SD above.

Weight-for-age indicators are no longer used as a measure of acute malnutrition, however they are still commonly used in growth monitoring. Related to the above definitions, GAM (Global Acute Malnutrition) is another commonly used term. GAM = SAM + MAM.

2.4.2 Evolution of case definitions

Since 1999, there have been several important evolutions of the WHO case definitions of SAM and MAM, as follows:

Mid-upper arm circumference (MUAC)

MUAC is now used as an independent case definition criterion, based on evidence of low MUAC being highly correlated with mortality. Case definitions are as follows:

- Severe acute malnutrition (SAM) = MUAC < 110mm (recently updated to <115mm)⁷⁶
- Moderate acute malnutrition (MAM) = MUAC <125mm

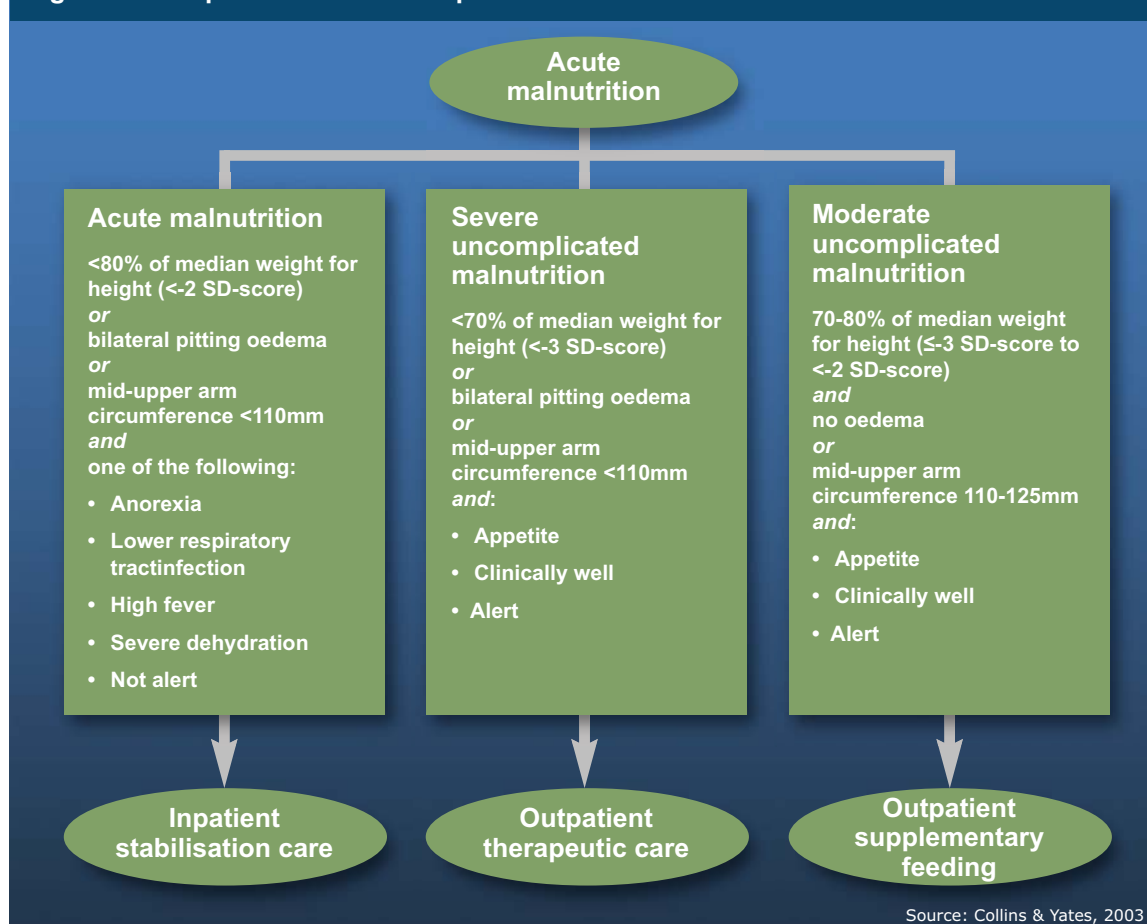
As a case detection method for use in resource poor and emergency settings, MUAC has particular advantages of age independence, simplicity, acceptability and cheapness. Arguments have been made for using MUAC as a sole admission criterion for programmes treating children six to 59 month malnutrition.⁷⁷ MUAC is not currently recommended for use in infants <6m.

'Complicated' and 'uncomplicated' malnutrition

The division of case definitions into 'complicated' and 'uncomplicated' malnutrition⁷⁸ recognises that two children with identical anthropometry do not necessarily have the same mortality/morbidity risks or treatment needs. Anthropometric status and clinical status are considered in parallel when directing children to inpatient or outpatient care (Figure 6).

2.5 Management of Acute Malnutrition

Figure 6: Complicated and uncomplicated acute malnutrition framework



Transition from NCHS to WHO-GS

The 1978 National Centre for Health Statistics child growth reference (NCHS)⁷⁹ is widely used by selective feeding programmes as the 'norm' to describe growth in infants and children. However, because of their limitations NCHS data fail to adequately describe the growth of apparently healthy, normal, breastfed infants.⁸⁰ The 2006 World Health Organisation Growth Standards (WHO-GS)⁸¹ are based on a much more broadly representative dataset and provide an international 'gold standard' of how children should grow when free of disease and when their care follows healthy practices such as breastfeeding and non-smoking.⁸² In May 2009, a joint statement by WHO and UNICEF⁸³ recommended that the WHO-GS is now used. Table 3 summarises implications of this transition.

Significant to MAMI, both the joint statement and the international consultation on which it is based⁸⁴ only address children aged six to 59 months. Implications of the transition for infants <math><6\text{m}</math> are not considered.

2.5 Management of Acute Malnutrition

Acute malnutrition can be tackled at 3 levels:

- Primary*: reducing the development (incidence) of malnutrition.
- Secondary*: reducing prevalence of malnutrition by earlier detection of or better treatment shortening the duration of an episode of malnutrition.
- Tertiary*: reducing the negative impacts of an established episode of malnutrition.

The MAMI Project focuses on secondary and tertiary treatment with specific reference to supplementary feeding programmes (SFP) and therapeutic feeding programmes (TFP), collectively described as selective feeding programmes. Primary prevention is critical but is beyond the scope of this investigation. SFP and TFP (both inpatient and community-based) will now be described.

2.5 Management of Acute Malnutrition

Table 3: NCHS and WHO-GS growth norms as applied to the case definition of acute malnutrition

	NCHS	WHO-GS
Key characteristics		
Type of growth 'norm'	Reference	Standard
Breastfeeding status of infants on whom the 'norm' is based	Mixed	Exclusively breast fed until at least four months of age
Acute malnutrition case definitions		
Oedematous malnutrition = SAM (irrespective of weight-for-height)	yes	yes
SAM (% of median)	<70% weight-for-height (WHM)	<i>not used</i>
MAM (% of median)	≥ 70% to < 80% WHM	<i>not used</i>
SAM (z-score)	<-3z weight-for-height (WHZ)	<-3z weight-for-height (WHZ)
MAM (z-score)	≥-3 to <-2 WHZ	≥-3 to <-2 WHZ
MUAC-defined SAM (6 to 59m children)	110mm	115mm
Implications for clinical caseload <i>relative numbers of 6 to 59 month children diagnosed with:</i>		
SAM: WHZ (NCHS) to WHZ (WHO)	1 (reference)	Increase in numbers diagnosed (2 to 4x increase) ⁽³⁶⁾
SAM: WHM (NCHS) to WHZ (WHO)	1 (reference)	Large increase in numbers diagnosed (8x increase in one study) ⁽⁴⁰⁾
MAM: WHZ (NCHS) to WHZ (WHO)	1 (reference)	Slight decrease in numbers diagnosed

Source: WHO & UNICEF (2009)

2.5.1 Supplementary feeding programmes (SFP)

Moderately malnourished children are typically treated in SFPs. They may be admitted directly or transferred from a therapeutic feeding programme (TFP) as they recover from severe malnutrition. Admissions are normally stable clinically, so outpatient-based, minimum intensity treatment is possible.

The aim of SFPs is to reduce the risk of death by restoring nutritional status through provision of foods or rations to supplement the child's home diet. Fortified foods typically distributed in SFPs include corn-soy blends (CSB), wheat soy blends and more recently, Ready to use Supplementary Foods (RUSF). SFPs may be targeted to at risk groups in a population, e.g. all children six to 59 months, or restricted to those children who are moderately malnourished.

Infants <6m who are malnourished do not qualify for supplementary food rations, on the basis they should be exclusively breastfed. In such cases, the mother of the malnourished infant may receive the supplementary food ration.

2.5.2 Therapeutic feeding programmes (TFP)

Severely malnourished children are clinically more compromised and require more intensive medical and nutritional treatment than is possible in SFPs. Such treatment can take place in inpatient and outpatient settings.

Inpatient treatment

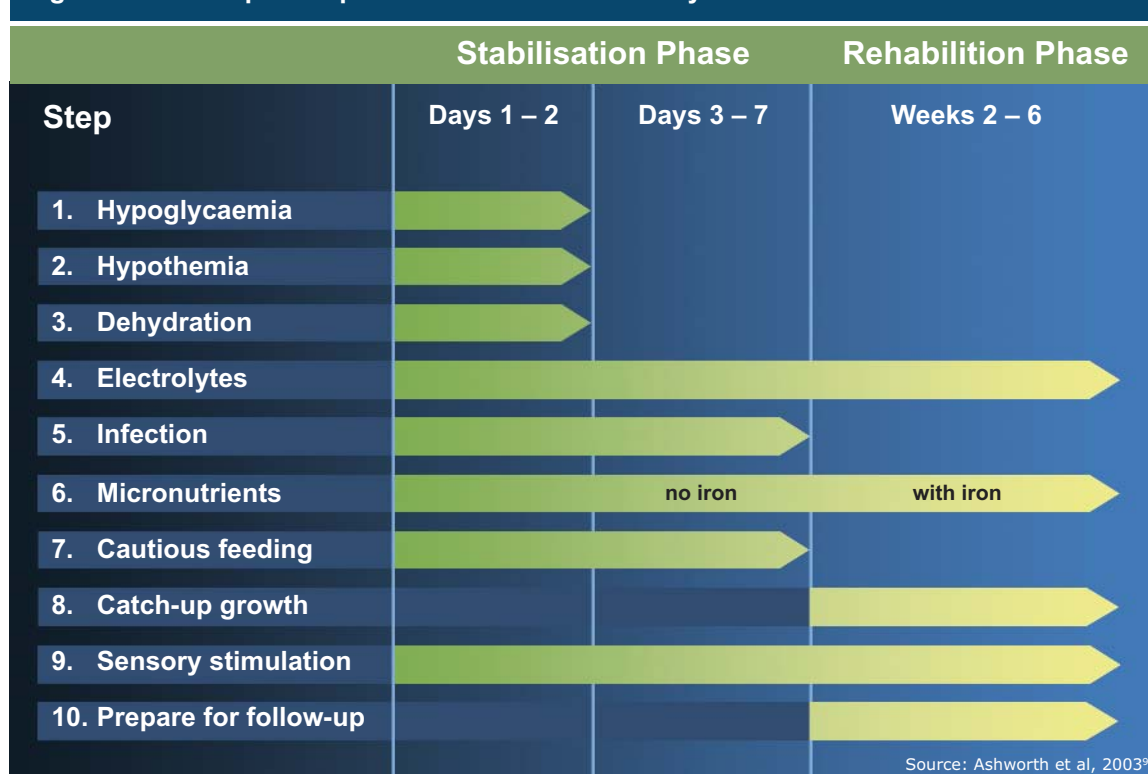
Traditionally, all children with severe acute malnutrition (SAM) were treated in 'inpatient' facilities (therapeutic feeding centres, nutrition rehabilitation units or paediatric wards). The focus of such

2.5 Management of Acute Malnutrition

treatment is to optimise the quality of care offered to individual children. This was often challenging in resource limited settings; a 1995 review found case fatality rates (CFR) to be typically 20-30% and sometimes as high as 60%.⁸⁵ Poor case management was identified as a major cause. In 1999 the WHO 'Management of severe malnutrition: a manual for physicians and other senior health workers' was produced as part of an international initiative to improve case management of SAM.^{86,87,88} Training materials support these guidelines.

According to the WHO guidelines, children with SAM are treated in two main phases, following a 'ten steps' approach to care⁸⁹ (see Figure 7). During initial treatment (stabilisation phase) therapeutic milk F75 is used; during 'rehabilitation' F100 is used following a short 'transition' period. Medical treatment include routine use of antibiotics and the importance of psychosocial support is also recognised. In the WHO (1999) guidelines, infants <6m are implicitly part of the < 5 year old group, but are not dealt with separately recognising the differences from older children (this is discussed more detail in Chapter 4).

Figure 7: Ten steps of inpatient treatment of severely malnourished children



Community based care

Community-based Management of Acute Malnutrition/ Community Therapeutic Care (CMAM/CTC) is an outpatient therapeutic feeding strategy developed on the basis of operational research over the past six to seven years^{91,92,93} and endorsed by major UN agencies in 2007.⁹⁴ CMAM/CTC classifies SAM as either complicated or uncomplicated to distinguish between sick children who need some intensive medical and nutritional treatment in an inpatient facility and clinically stable children (the majority of cases) who can be safely treated at home.

The development of ready-to-use therapeutic food (RUTF) made CMAM/CTC a practical possibility. RUTF is an energy and nutrient dense paste, a therapeutic food that is nutritionally equivalent to F100 milk, but needs no preparation and can be eaten direct from its container.

The structure and 'flow' through a typical CMAM/CTC programme is illustrated in Figure 8 and involves:

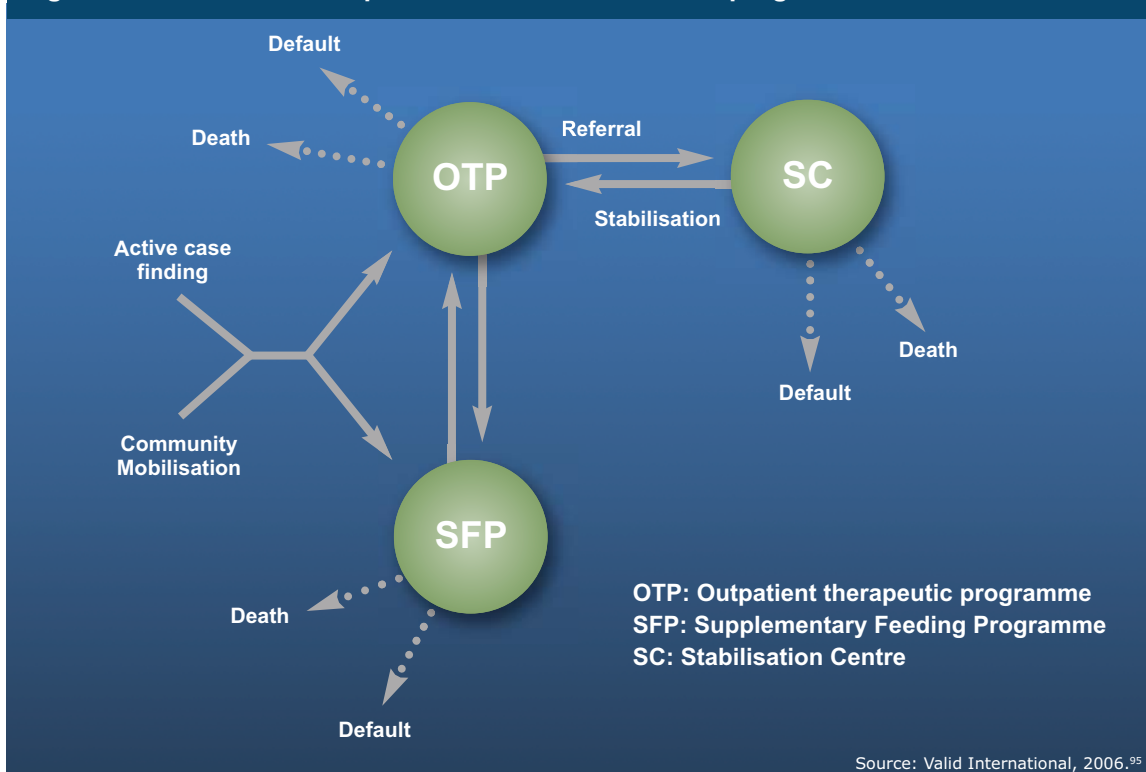
- Active case finding and community mobilization to identify malnourished children.
- Referral of children with moderate acute malnutrition to SFP programmes.
- Direct admission of children with uncomplicated SAM to outpatient treatment (OTP), using RUTF.
- The minority of children with complicated SAM are admitted first to a 'stabilization centre' (SC) which follow WHO protocol for phase one (stabilisation).

2.6 Summary Findings

- e) After 'stabilisation', patients are returned to the OTP to complete rehabilitation (phase 2) in the community.
- f) Following recovery from OTP treatment, patients are often referred to SFP (if available).

In current guidelines, RUTF is not recommended for infants <6m; infants <6m with SAM are considered 'complicated' cases and are referred for inpatient treatment (this is explored in more detail in Chapter 4).

Figure 8: Structure of and patient 'flow' within a CMAM programme



2.6 Summary Findings

Infant <6m malnutrition is an important public health problem. Maternal and child undernutrition contribute to 35% of the 9.2 million under five deaths per year; infants are vulnerable to higher morbidity and mortality, particularly in emergencies.

Infants <6m have unique characteristics and should be considered a distinct subgroup.

The protection and support of IFE is mandated by international law, is necessary for meeting international standards and is regulated by operational and technical guidance.

WHO case definitions of acute malnutrition (1999) form the basis of most protocols on the management of acute malnutrition. MUAC is now often used as an independent case definition criterion. Case definitions are now commonly divided into 'complicated' and 'uncomplicated' malnutrition.

A transition is underway from the use of NCHS growth references to the 2006 WHO Growth Standards (WHO-GS). It is shown that using WHO-GS, higher numbers of children six to 59 months will be diagnosed with SAM.

In emergencies, acute malnutrition is treated in selective feeding programmes. MAM is treated in Supplementary Feeding Programmes. SAM is treated in Therapeutic Feeding programmes. Complicated cases of SAM are treated as inpatients using WHO '10 steps' protocol and, increasingly, uncomplicated SAM cases are managed in community-based programmes that use RUTF.

Endnotes

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