

WHO, UNICEF and SCN Informal Consultation on Community-Based Management of Severe Malnutrition in Children

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Meeting report



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Introduction

About ten million children are estimated to suffer from severe malnutrition (severe wasting and/or presence of bipedal oedema) globally, which greatly increases mortality risk. Severe malnutrition is therefore an important cause of death in infants and young children, but one that is increasingly open to successful management.

Prevention of severe, life-threatening, malnutrition remains a priority, but even with expanded programmes a proportion of children will develop severe malnutrition and require treatment in the foreseeable future. Moreover, acute crises leading to high levels of malnutrition are likely to continue, and addressing the threats to survival under these conditions will continue to be a humanitarian concern. Effective interventions for the management of severe malnutrition with adequate coverage of affected populations could prevent hundreds of thousands of child deaths each year, thus contributing to the achievement of the Millennium Development Goals (MDGs) for poverty and child mortality reduction. Recently, new approaches to treatment have become available, which led to the meeting held at WHO.

The capacity to treat large numbers of severely malnourished children is lacking in most countries, particularly the poorest where the problems are most extensive. While facility-based (inpatient) treatment has proven effective in reducing case-fatality rates, access to suitable health facilities is often limited, especially where most needed. This applies particularly to emergencies, and in non-emergencies where health resources are very limited. Besides, inpatient care requires that caretakers stay in the health facility with the child for several weeks, which is often impractical, and disruptive for the family.

Recent evidence from field programmes has shown that management of severe malnutrition at home (known as 'community-based management') can be very effective and achieve high levels of coverage in target populations. This approach is based on early detection and assessment of severely malnourished children in the community and home-based management of those without complications; those with complications – notably marked by loss of appetite – will still need facility-based treatment. These procedures are considered to be effective for application both in emergencies, and in non-emergencies where there is significant severe malnutrition. They may also have important potential for inclusion in broader health and nutrition programmes – which include preventive measures – as a back-up for when severe life-threatening malnutrition nonetheless occurs.

The meeting aimed to review recent experiences and evidence, and to update global recommendations for the management of severe malnutrition as an essential intervention towards

achieving the MDGs for poverty and child mortality reduction. Drawing on the information presented in the five background papers, the reviews of these papers and presentations of additional data from research and programmes, participants in the consultation examined the implications of these new developments for the management of severe malnutrition. The consultation identified areas of consensus that can be translated into evidence-based guidelines as well as knowledge gaps that should be addressed by research.

Objectives of the meeting

Overall Objectives:

1. To identify areas of consensus on the community-based management of severe malnutrition in children that can be translated into evidence-based global guidelines;
2. To identify knowledge gaps that should be addressed by research.

Specific objectives:

1. To collect evidence on the feasibility, safety and effectiveness of community-based approaches for treating severely malnourished children, considering published and unpublished research and field based experience;
2. To identify areas of consensus that can be translated into global guidelines and knowledge gaps, particularly on the following points:
 - a) *Identification of severely malnourished children in the community and their referral;*
 - b) *Dietary and medical protocols adapted for community-based treatment of severe malnutrition, including in situations of high HIV prevalence;*
 - c) *Sustainability of community-based management of severe malnutrition in children;*
 - d) *Integration of programmes for community-based management of malnutrition into the national health system and their scaling up.*

The meeting focused on community-based management of severe malnutrition in children.

The meeting did not make recommendations about the primary prevention of malnutrition. It did acknowledge, however, the primary importance of programmes aiming at preventing malnutrition to reduce the malnutrition related mortality. The meeting did not discuss inpatient treatment of severe malnutrition which is already described in detail in existing WHO documents.¹

WHO will disseminate the findings widely among relevant stakeholders and develop guidelines for the management of severe malnutrition in children at the community level, as appropriate.

¹ Management of severe malnutrition: a manual for physicians and other senior health workers. WHO, 1999. Available at: http://www.who.int/nutrition/publications/en/manage_severe_malnutrition_eng.pdf

Nomenclature:

The term community-based management of severe malnutrition has been chosen for this meeting to be consistent with the existing WHO nomenclature in the field of child health.

Community-based management refers to treatments that are implemented with some external input, such as the presence of a health worker for diagnosing the condition, instituting treatment and monitoring the condition of the child at home. This applies for example for the community-based management of pneumonia where community workers with specific training are able to identify, prescribe antibiotics and monitor the treatment of children with pneumonia and identify severe cases for referral. This also applies to the treatment of severe malnutrition when a health worker is involved in identifying the severely malnourished child and in providing treatment that may include a mineral and vitamin supplement or Ready to Use Therapeutic Food (RUTF).

Facility-based management refers to treatment in a hospital or centre that provides skilled medical and nursing care on an inpatient basis.

Severe malnutrition is defined as severe wasting (< 70% weight-for-height or < - 3 Z-scores of the median NCHS/WHO reference) and/or presence of bipedal oedema (kwashiorkor).

Ready-to-Use-Therapeutic Food (RUTF) is a ready-to-use food with a similar nutrient-to-energy ratio as F100.

Summary of presentations and discussions

Identification at community level of severely malnourished children in need of treatment

Severe malnutrition is identified by the presence of severe wasting and/or bilateral oedema. Currently severe wasting is defined as a weight-for-height <70% or <-3 Z-scores of the median NCHS/WHO reference, but the equipment and skills to measure weight-for-height may not be available at community level.

The consultation acknowledged that a Mid Upper Arm Circumference (MUAC) of less than 110 mm is a suitable criterion to identify at the community level severely wasted children aged 6-59 months in need of treatment since it is a good predictor of the risk of death among these children and is easier to measure than weight and height.

If ages are uncertain, height (65-110 cm) may be used as a proxy for age to identify children in the 6-59 month age group. A stick with markings at 65 and 110 cm can be used. The major risk of adopting a height cut-off is that young stunted children (more than 6 months but <65cm) may be considered ineligible for MUAC. In practice, any severely malnourished child who has enough appetite and the adequate reflexes to eat ready-to-use therapeutic food (RUTF) will benefit from treatment.

At facility level, weight-for-height, MUAC and presence of bipedal oedema can be used independently in detection of severely malnourished children. Children having either a MUAC less than 110 mm, or a weight-height < 70% or <-3 Z-scores of the median NCHS/WHO reference or bipedal oedema should be admitted to a programme of management of severe malnutrition. Where growth monitoring programmes identify children with low weight-for-age, MUAC might also be measured so that only those who have a low MUAC (<110 mm) are referred to a therapeutic feeding programme.

Community level utilisation of MUAC has been successfully employed in several countries, including on a large scale in Ethiopia. In South Wollo (Ethiopia), errors in MUAC measurements leading to bias in admissions to therapeutic feeding programmes by 2,900 community volunteers were rapidly reduced by identifying the health workers who referred children who did not need it and reinforcing their training.

Uncertainties persist regarding anthropometric criteria for admission of children less than six months to a therapeutic feeding programme. Low birth weight is often a key determinant of poor

anthropometric status of these children. In absence of information on birth weight, it is sometimes difficult to determine if a child younger than six months is severely malnourished. Until better information becomes available it was agreed that visible severe wasting and/or bilateral oedema should be used to determine if a child younger than six months is severely malnourished. Research on identification and dietary management of this age group was seen as a priority.

Management of severe malnutrition in the community

The evidence considered at the meeting was derived primarily from responses to recent emergencies in Sub-Saharan Africa. An important aim of the meeting was to consider how far this generally positive experience could be transferred to non-emergency situations, particularly those where health resources are very limited.

Substantial experience, mainly in humanitarian emergencies, has been gained in the community-based management of severe malnutrition over recent years. Presentations from Malawi, Sudan, Niger, Ethiopia and Bangladesh showed successful management of large numbers of severely malnourished children in the community, with high recovery rates, low case fatality rates and a high coverage. Malawi also reported a very low relapse rate 15 months after discharge. The efficacy of such programmes seems now well established if basic principles of treatment are followed, and there is also indication of high effectiveness. Still the level of effectiveness would be better assessed if better estimates were available on the risk of mortality of untreated severely malnourished children. This should be explored by re-examining past studies of the relationship between nutritional status and survival.

Early detection and minimising barriers to access in order to promote early presentation of cases were seen as key in the success of therapeutic feeding programmes in the community because cases of severe malnutrition identified early are easier to treat and less likely to require inpatient treatment. Without active case-finding, many severely malnourished children are never identified because families do not seek care for them. The proportion of children who can be treated exclusively at community level depends on the local situation and according to the presentations made may vary from 60% to 90%. Community-based and facility-based components of the treatment of severe malnutrition should be closely linked so that children who are too ill to be treated at the community level or are not responding to treatment can be referred to the facility level, and those receiving facility-based treatment who have regained their appetites can be transferred for continued care in the community.

In addition to presence of severe oedema and acute medical conditions, appetite is a crucial factor for differentiating between children who need facility- or community-based care. It was stressed that the conditions of the “appetite test” should be standardized.

Ready to use therapeutic foods (RUTF) can be used successfully to treat severely malnourished children in the community. In contrast to milk-based therapeutic diets, RUTF do not contain water, so bacteria do not grow if there is accidental contamination and RUTF storage does not require refrigeration.

Data presented during the consultation suggest that it is not possible to reach the micronutrient content of milk-based therapeutic diets (F-100) with local foods only. Nevertheless, studies from Bangladesh show that it is also possible to successfully treat severely malnourished children at home with a carefully designed diet using low cost family foods together with a supplement of minerals and vitamins. These same mixtures of family foods also make good complementary foods and have the potential to prevent malnutrition in the long term.

The provision of RUTF in countries like India or Bangladesh where there are millions of severely malnourished children will be challenging. In this case, treatment based on nutrient-rich family foods together with a supplement of minerals and vitamins might be an option. However, the consultation emphasised that efficacy of local therapeutic diets should be tested clinically and that further research on the feasibility of this approach on a large scale is needed along with research on cost-effectiveness of nutritional rehabilitation using local diets or RUTF. The anti-nutrient content (e.g. phytate) of some foods was seen as a limiting factor for reaching adequacy of local diets for nutritional rehabilitation of the severely malnourished.

Some outstanding issues in the community-based management of severe malnutrition remain, such as provision of a systematic antibiotic treatment and the need to provide food-insecure families with a food ration on top of RUTF. These issues are likely to vary depending on the context and need further research.

In order to be successful at scale, therapeutic feeding programmes should be implemented through existing health service delivery. Concern was expressed as to whether routine health systems have the capacity to implement and sustain this. Where health systems are dysfunctional, the need to support the entire health system was underlined. The creation of volunteers' networks to identify severely malnourished children at community level also raised some practical concerns, including the range of tasks that can be reasonably asked for and incentives that might be provided.

The participants strongly advocated for the improvement of nutrition training at medical and nursing schools and for the revision of text books, which currently give misleading information on the pathology and the treatment of severe malnutrition.

The lack of clarity of nomenclature regarding the different types of malnutrition was highlighted as a difficulty that should be resolved. Severe malnutrition, unless clearly defined, is an inclusive term which can refer to a wide range of pathologies from wasting to stunting, obesity or anaemia. The consultation recommended that the issue of nomenclature of nutrition disorders and nutrition interventions be urgently addressed to promote international consistency and facilitate advocacy.

Community-based management of severe malnutrition in the context of high HIV prevalence

The majority of HIV-positive severely malnourished children will benefit from community-based treatment. However, experiences from Malawi showed that rates of weight gain and of recovery were lower among these children than among HIV-negative patients, while case fatality rate was higher. Difference in weight gain was probably more closely related to a higher incidence of infections in HIV-positive patients, which undermined their appetite, than to family sharing of RUTF. The proportion of HIV-positive and HIV-negative children requiring inpatient treatment for severe malnutrition did not differ.

While strong linkages between community-based management of severe malnutrition and HIV/AIDS programmes, such as Voluntary Counselling and Testing, prophylactic cotrimoxazole to prevent the risk of contracting *Pneumocystis* pneumonia and other infections and Antiretroviral Therapy, were seen as fundamental, it was less clear if full integration of the programmes at the delivery point was desirable. Care for HIV-positive people represents an extra burden for the community, particularly for women and girls, resulting in additional physical, psychological, emotional, economic and social stress. Assistance to women, such as support to their own health and care and provision of incentives, especially when they are enrolled as community volunteers, was highly recommended.

Sustainability and scaling up

The treatment of severe malnutrition has received increased attention at national level over the past few years. Several representatives of Ministries of Health (MOH) aired their interest in scaling up or implementing community-based management of severe malnutrition. Encouraging reports from Ethiopia, Malawi and Niger illustrated how the capacity to manage severe malnutrition can be scaled up, notably through the establishment of national protocols, development of implementation of community-based management, training and capacity building of MOH staff and provision of RUTF.

Small scale, well run programmes were seen as playing a useful role in demonstrating procedures and their benefits, thereby creating demand for larger scale programmes. UN agencies, such as WHO, UNICEF and WFP should help governments to scale-up programmes. There is a need to advocate for the sustainability of funds for the treatment of severe malnutrition. The lack of funding continuum for the treatment of severe malnutrition between emergency and development contexts often hampers scaling up or even maintenance of existing programmes, although a large number of severely malnourished children still need treatment after the emergency is over. Scaling up could also be based on experiences from “learning sites» within research projects. In addition, further documenting the efficacy and effectiveness of community-based treatment of severe malnutrition is a crucial step to strengthening evidence-based advocacy.

Within the process of scaling up, the overall context must be carefully considered. At family level, underlying determinants of malnutrition such as food insecurity and environment-related infections should be taken into account. At the macro level, the functioning of the existing health system, which depends on the resources allocated to it, which in turn are contingent upon bilateral or multilateral support in many countries, will affect the implementation of community-based programmes.

Participants discussed levels of severe malnutrition that might trigger the implementation of community-based management. It was agreed that community-based treatment should be part of the routine health system in most developing countries. Malnutrition levels that trigger large scale humanitarian interventions should be better defined. In this regard, the response to high prevalence of severe malnutrition can be viewed as dependent on the balance between external inputs and health system capacity. In situations with low capacity of the existing health system, external inputs and response would be relatively significant while in an area with a strong health system capacity, external support would be more limited.

Coordination and clear definition of the roles of the different stakeholders (UN agencies, NGOs and MOH), joint assessments of nutrition situations, harmonisation of policies and guidelines and development of standards for the production of RUTF were defined as essential factors for advocacy and mainstreaming treatment of severe malnutrition at global, national and local levels.

The most challenging issues for scaling up and sustainability were identified as:

- Integration of treatment of severe malnutrition in existing health system, especially when they function poorly;

- Training and capacity building of MOH staff;
- Capacity of MOH to monitor activities and the nutrition situation;
- Community participation and mobilisation;
- Access to affordable RUTF or suitable local foods supplemented with vitamins and minerals;
- Integration with other nutrition components such as education.

While the technology to produce RUTF at low cost can be easily developed even in countries with limited industrial capacity, the cost of the product may still be too high in relation to available resources. Provision of RUTF should therefore be considered as a priority by food aid projects and external donors. In order to facilitate the sustainability of community-based management of severe malnutrition, there is also a need for greater funding to support the primary health care system. Cost-recovery was seen as a major factor undermining poor families' access to health care. The consultation recommended that treatment of severe malnutrition should be provided free of charge at both facility and community level.

Conclusions and guiding principles

Treatment of severe malnutrition is critical for reducing child mortality but, despite the known efficacy of existing protocols, it has received insufficient attention as a public health intervention. The overall conclusion of the consultation is that community-based management of severe malnutrition is an effective intervention to treat a large number of children suffering from severe malnutrition. It can achieve a low case fatality rate, provided adequate dietary and medical treatment is delivered, close follow-up is ensured and early detection is implemented at community level. In order for these programmes to be successful, efforts must be made to reduce barriers to access. Integration of such programmes as part of the routine health system would have a major public health impact and contribute to the achievements of the Millennium Development Goals. This can only be accomplished by mainstreaming the management of severe malnutrition into international, national and local health and development agendas.

Participants agreed on the following guiding principles for community-based management of severe malnutrition:

Identification of severely malnourished children in the community in order to provide for treatment

1. In addition to weight-for-height < 70% or < -3 Z-scores of the median NCHS/WHO reference values and/or bilateral oedema, MUAC < 110 mm can be used independently as a criterion for admission to a therapeutic feeding programme for children aged 6-59 months. Children with a MUAC < 110 mm should be admitted to a programme for the management of severe malnutrition regardless of their weight-for-height.
2. MUAC is a simple and practical tool which should be used by community workers to identify severely malnourished children.
3. In infants less than six months of age, it is recommended that "visible severe wasting" and/or oedema, in conjunction with difficulties in breastfeeding be used as admission criteria until further studies are undertaken to develop more precise admission criteria for treatment.
4. High coverage (both temporal and spatial) of the programmes, achieved through active case-finding activities, as established in the SPHERE minimum standards² must be a key objective for therapeutic feeding programmes.

Management of severely malnourished children in the community

² The Sphere Project. 2004. Humanitarian charter and minimum standards in disasters response. Geneva: The Sphere Project.

1. It is desirable that programmes for the management of severe malnutrition should usually have a community-based and a facility-based component, in order that severely malnourished children with no complications be treated in the community while those with complications are referred to an inpatient treatment facility with trained staff.
2. It is highly desirable to manage severely malnourished children with no complications in the community without an inpatient phase. These are severely malnourished children who are alert, have good appetite, are clinically well, are not severely oedematous, and have reasonable home-care circumstances.
3. Children with severe malnutrition having mild or moderate oedema and good appetite but are not severely wasted can also be treated at home, without an inpatient phase.
4. Children with severe malnutrition and complications should be referred to an inpatient treatment facility with trained staff. These children include severely malnourished children with anorexia, children with severe oedema, children with both severe wasting (MUAC < 110 mm or weight-for-height < 70% or < -3 Z-scores of the NCHS/WHO reference) and mild or moderate oedema, or children who are clinically unwell.
5. For those treated as inpatients, after the complications of severe malnutrition are under control, management should normally be continued in the community. Children who deteriorate at home should be referred for assessment and further management.
6. Ready to Use Therapeutic Foods (RUTF) are useful to treat severe malnutrition without complications in communities with limited access to appropriate local diets for nutritional rehabilitation.
7. When RUTF is given to children with severe malnutrition, 150-220 kcal/kg/day should be provided.
8. When families have access to nutrient-dense foods, severe malnutrition without complications can be managed in the community without RUTF, by means of carefully designed diets using low-cost family foods, provided appropriate minerals and vitamins are given.
9. Efficacy of local therapeutic diets should be tested clinically.
10. Treatment of young children should include support for breastfeeding and messages on appropriate infant and young children feeding practices.
11. Children less than 6 months should not receive RUTF nor solid family foods. These children need milk-based diets and their mothers support to re-establish breastfeeding. They should not be treated at home.
12. Monitoring of effectiveness of treatment should be based on weight gain of at least 5 g/kg/day for severely wasted children³, low case fatality, defaulting and treatment failures, and length of stay under treatment.

³ Rate of weight gain was deliberately changed to a lower level than the SPHERE minimum standards² which referred to inpatient treatment of severe malnutrition.

Community-based management of severe malnutrition in the context of high HIV prevalence

1. The general principles and guidelines for the care of severely malnourished children in areas of high HIV prevalence do not fundamentally differ from those where HIV is rarely seen.
2. In areas where HIV prevalence is high, there should be unfettered access to HIV services (e.g. VCT, cotrimoxazole prophylaxis, nutritional counselling, ART) and seamless articulation from the onset between levels of care (community, health centre and hospital) and between HIV treatment and malnutrition programmes.
3. All therapeutic foods used, including RUTF, should be chosen to be appropriate for HIV infected, severely malnourished children, based on current scientific evidence.

Next steps

In follow-up of the meeting, WHO will lead a process to develop norms and standards and accompanying guidelines for policy makers and programme managers on community-based management of severe malnutrition in children including specifications of RUTF to facilitate production with local ingredients in countries. Further actions of the working group will include the promotion of community-based management in selected countries, including technical assistance to introduce the approach into national health policy and health systems, and careful documentation of experiences in order to refine the implementation approach. The research questions identified in the consultation, such as the need for systematic antibiotic therapy and the dietary management of children less than six months, will be followed up.

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Annex 2

Agenda

Monday, 21 November

S1: Morning session 1

- 09.00- 09.45 Introduction
(Dr Liz Mason, Dr Denise Coitinho, Dr Roger Shrimpton, Dr Flora Sibanda-Mulder)
- Opening remarks
 - Objectives of the meeting
 - Introduction of participants
 - Nomination of Chairperson and rapporteurs for the whole meeting and for each session
 -
- 09.45 -10.00 Community-based management of severe malnutrition: technical background
(Dr André Briend)
- 10.00 - 10.15 Update on the facility-based management of severe malnutrition
(Dr Sultana Khanum).
- 10.15 -10.30 Discussion
- 10.30 - 11.00 Coffee/tea

S2: Morning session 2

Objective: Discuss criteria for identification of severely malnourished children in the community and referral

- 11.00 - 11.20 Detection of severely malnourished children at the community and referral (Dr Mark Myatt)
- 11.20 - 11.35 Interacting with the community and volunteers to identify severely malnourished children
(Ms Emily Mates)

11.35 - 12.30 Discussion

12.30 - 14.00 Lunch

S3: Afternoon session 1

Objective: Review evidence of efficacy and effectiveness of community-based management of severe malnutrition

- 14.00 - 14.20 Efficacy and effectiveness of community-based treatment of severe malnutrition
(Dr Ann Ashworth)
- 14.20 - 14.35 Community-based nutritional rehabilitation without food distribution. Experience from Bangladesh
(Dr Tahmeed Ahmed)

14.35 - 14.50 Is it possible to achieve the nutritional density of F100 or RUTF with local foods?
(Dr Nicole Darmon)

14.50 - 15.30 Discussion

15.30 - 16.00 Coffee/tea

S4: Afternoon session 2

Objective: Present and discuss dietary and medical protocols for community-based management of severe malnutrition, including the management of HIV+ children.

16.00 -16.15 Dietary and medical protocol in emergency and non emergency situations (Dr Steve Collins)

16.15 -16.30 Ambulatory feeding programmes: MSF Guidelines
(Mrs Saskia van der Kam)

16.30 - 16.45 Dietary and medical protocol in Malawi
(Dr Mark Manary)

16.45 - 17.30 Discussion

Tuesday- 22 November

08.30 – 08.45 Rapporteur: Summary of day 1 presentations

S5: Morning session 1

Objective: Discuss community-based management of severe malnutrition in the context of HIV

08.45 - 09.05 Impact of community-based supplementation on the recovery of HIV+ severely malnourished children
(Dr Mark Manary)

09.05 - 09.25 Community-based management of severe malnutrition in a high HIV prevalence
(Dr Paluku Bahwere)

09.25 - 09.45 Social aspects of community-based management of severe malnutrition in the context of a high HIV prevalence
(Dr Mickey Chopra)

09.45 - 10.20 Discussion

10.20 - 10.30 Introduction of group work

10.30 - 11.00 Coffee/tea

S6: Morning session 2

Objective: Find areas of consensus – (I): Dietary and medical management of severe malnutrition in the community

11.00 -12.30 Group work

Group 1: Identification of severely malnourished children in the community

Group 2: Dietary and medical management of severe malnutrition in the community, (where HIV prevalence is low)

Group 3: Dietary and medical management of severe malnutrition in the community, (in settings with high HIV prevalence)

12.30 - 14.00 Lunch

S7: Afternoon session 1

Objective: Review key factors determining the success and sustainability of community-based programme of management of severe malnutrition

14.00 - 14.20 Key issues in the success of community-based management of severe malnutrition
(Dr Steve Collins)

14.20 - 14.35 Sustainability and integration of community-based management in existing programmes
(Ms Valerie Gatchell)

14.35 - 14.50 A retrospective and prospective view of success and sustainability in community therapeutic care programming
(Ms Frances Mason)

14.50 -15.30 Discussion

15.30 -16.00 Coffee/tea

S8: Afternoon session 2

Objective: Examine how to scale up programmes on the community-based management of severe malnutrition

16.00 -16.15 Scaling up the RUTF production from the kitchen level to large scale production
(Dr Mark Manary)

16.15 - 16.30 Questions

16.30 -17.30 Panel discussion: Scaling-up community-based programmes for the management of severe malnutrition in children
(Dr Martin Bloem, Ms Sylvie Chamois, Dr Mahdi Ali Mohamed, Dr Zenebeche Yadete, Dr Noel Zagre)

17.30-17.35 Introduction of the group work for Day 3

Wednesday- 23 November

08.30 – 08.45 Rapporteur: Summary of day 2 presentations

S9: Morning session 1

Objective: Find areas of consensus – (II): Key issues and constraints in the success of integration, scaling up and sustainability of the community-based management of severe malnutrition

8.30-10.30 Group work

Group 1: Implementing and scaling up community-based management of severe malnutrition in settings where health services are not functioning and where there are external inputs (staff, logistic, RUTF...) or where they can be made available

Group 2: Implementing and scaling-up community-based management of severe malnutrition in settings where a health infrastructure is in place and where there are no major external inputs (staff, logistic, RUTF...).

Group 3: Implementing and scaling-up community-based management of severe malnutrition in intermediate situations

10.30 -11.00 Coffee/tea

S10: Morning session 2

Objective: Formulate key recommendations - (I): Dietary and medical management of severe malnutrition in the community

11.30 -12.30 Report from the groups and discussion:

Group 1: Identification of severely malnourished children in the community

Group 2: Dietary and medical management of severe malnutrition in the community, (where HIV prevalence is low)

Group 3: Dietary and medical management of severe malnutrition in the community, (in settings with high HIV prevalence)

12.30 - 14.00 Lunch

S11: Afternoon session 1

Objective: Formulate key recommendations – (II): Scaling up the community-based management of severe malnutrition

14.00 -15.30 Report from the groups and discussion:

Group 1: Implementing and scaling up community-based management of severe malnutrition in settings where health services are not functioning and where there are external inputs (staff, logistic, RUTF...) or where they can be made available

Group 2: Implementing and scaling-up community-based management of severe malnutrition in settings where a health infrastructure is in place and where there are no major external inputs (staff, logistic, RUTF...)

Group 3: Implementing and scaling-up community-based management of severe malnutrition in intermediate situations

15.30 - 16.00 Coffee/Tea

S12: Afternoon session 2

Objective: Presentation of key conclusions – Next steps

16.00 - 16.45 Presentation of key conclusions and recommendations
(Chair)

16.45 - 17.00 Next steps
(Dr Liz Mason)

17.00 - 17.15 Closing remarks
(Dr Denise Coitinho, Dr Flora Sibanda-Muller, Dr Roger Shrimpton)

Annex 3

Abstracts of presentations

Community-based management of severe malnutrition: technical background

André Briend, WHO, CAH, Geneva, Switzerland

The WHO Global strategy for infant and young children feeding adopted by the 56th World Health Assembly (2002) and UNICEF executive board recommends "searching actively for malnourished infants and young children so that their condition can be identified and treated, they can be appropriately fed and their care givers can be supported". Very few programmes in practice implement an active search of severely malnourished children. The current IMCI guideline is to look for severe visible wasting or presence of oedema and to refer urgently severely malnourished children to the hospital. This facility-based approach seems to have little impact in terms of mortality at the population level. In any case, referring severely malnourished children for treatment is not listed among the interventions which can potentially prevent a large number of child deaths.⁴

Severe malnutrition, however, can represent an important cause of death of children aged 6 to 59 months in populations with a high level of malnutrition (table).

Table: Proportion of deaths (%) attributable to severe malnutrition (defined by MUAC < 110 mm) observed in available population based studies.⁵

Bangladesh	24.9
Bangladesh	19.1
Bangladesh	33.1
N Malawi	6.7
SW Uganda	16.7
Senegal ⁶	10.2

In recent years, several NGOs working both in emergency and non emergency situations developed a new community-based approach to treat severe malnutrition. It includes active searching of severely malnourished children in the community and treatment of the uncomplicated cases at the community level, often based on the use of ready to use therapeutic foods. This approach has the potential to treat large numbers of children who cannot be reached by the traditional facility-based approach. It is important to examine the evidence supporting this new approach and to assess to what extent it can be scaled up and made sustainable in countries with a high prevalence of severe malnutrition.

⁴ Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS; Bellagio Child Survival Study Group. How many child deaths can we prevent this year? *Lancet*. 2003; 362:65-71.

⁵ Pelletier DL, Frongillo EA Jr, Schroeder DG, Habicht JP. A methodology for estimating the contribution of malnutrition to child mortality in developing countries. *J Nutr*. 1994; 124 (10 Suppl):2106S-2122S.

⁶ Garenne M, Maire B, Fontaine O, Dieng K, Briend A. Risques de décès associés à différents états nutritionnels chez l'enfant d'âge préscolaire. Etude réalisée à Niakhar (Sénégal), 1983-1986.

Severe malnutrition: Report of a consultation to review current literature

Sultana Khanum, WHO, NHD; Geneva, Switzerland

Malnutrition contributes to 53% of deaths of children under-five in developing countries. Severely malnourished children often comprise the majority of inpatient paediatric deaths. This is because higher proportions of them die compared with other paediatric admissions and this primarily stems from poor understanding of the complexity of physiological changes and of correct case-management among doctors and nurses. Typically 25-30% of children with severe malnutrition die during hospital treatment; this rate is even higher (50-70%) in African hospitals. Most of these deaths can be avoided by following treatment guidelines. WHO together with international experts has developed guidelines for treating severe malnutrition and a training course for doctors and nurses. Where the guidelines have been implemented appropriately, mortality has been reduced by at least half.

In September 2004, WHO held a Consultation to consider if changes to the WHO malnutrition guidelines may be required as result of new evidence. The consultation concluded that only limited peer-reviewed new research for the period under review (1998-2004), in which severely malnourished children had been studied, was available. During this period, however, substantial advances in knowledge about HIV/AIDS have occurred in recent years and there is now increased opportunity for HIV-testing and antiretroviral therapy. Changes in the guidelines were therefore recommended in relation to treatment of pneumonia and provision of prophylactic cotrimoxazole for severely malnourished HIV-positive children. Knowledge gaps were identified particularly in relation to feeding infants aged < 6 months with severe malnutrition and to the effectiveness and pharmacodynamics of antiretroviral therapy in severely malnourished children who are HIV-positive. To guide policy regarding optimal dietary management of very young severely malnourished infants, there is an urgent need for observational studies of alternative formulations. Also for HIV-positive infants where definitive diagnostic virological testing of HIV is not available, research is needed to identify signs that are predictive of HIV, indications for treatment with antiretrovirals and their pharmacodynamics.

A review of methods to detect cases of severely malnourished children in the community for their admission into community-based therapeutic care programmes

Mark Myatt, Institute of Ophthalmology, University College London, UK

The problems associated with the use of weight-for-height as a referral and admission criteria for community therapeutic care programmes and the need for an alternative criterion were discussed.

The complexity and cost of measuring weight-for-height make it unsuitable for use by community-based volunteers. This had led many community therapeutic care programmes to adopt a two-stage screening and admission procedure in which mid-upper-arm-circumference (MUAC) was used for referral and weight-for-height was used for admission. This resulted in many individuals who were referred for care using MUAC being subsequently refused treatment because they did not meet the weight-for-height admission criteria. This *problem of rejected referrals* was found to lead to:

- Carers of referred-then-rejected children becoming unwilling to attend for admission even when their child's condition had deteriorated;
- Carers of rejected children actively disparaging the programme;
- Local leaders becoming disillusioned with the programme;
- Low levels of staff and volunteer morale and performance.

All of which had a negative impact on programme coverage.

The use of weight-for-height also led to problems with programme acceptance and integration with existing healthcare provision in settings where growth monitoring programmes using weight-for-age or community nutrition programmes using height-for-age were operating.

A general, and generally accepted, framework for assessing the appropriateness of case-detection methods in different contexts was used to review the options available for case-detection of severely malnourished children in the community suitable for use in programmes that follow the community therapeutic care delivery model. Clinical and anthropometric methods were reviewed with regard to their ability to reflect both mortality risk and nutritional status.

The review found that:

- MUAC or MUAC-for-height with the addition of the presence of bipedal oedema are the indicators most suited to screening and case-detection for malnutrition in the

community;

- MUAC-for-height offers no significant advantage over MUAC alone which is the simpler and cheaper measure;
- Weight-for-height is one of the least useful indicators for screening and case-detection for malnutrition in the community;
- Clinical assessment performs worse than any anthropometry-based method.

A review of published data suggested that the case-definition:

MUAC < 110 mm OR the presence of bipedal oedema

with MUAC measured using colour banded straps is suitable for screening and case-detection for severe malnutrition in the community. It was noted that this case-definition should be applied only to children aged between six and fifty-nine months.

Monitoring and discharge criteria were also reviewed and it was found that there was no compelling evidence to support a move away from using weight in combination with clinical criteria for monitoring and discharge.

Interacting with the community and volunteers to identify severely malnourished children

Emily Mates, Concern, Ethiopia

A strong community volunteer network can have a significant impact on community-based therapeutic programmes by supporting and sustaining programmes, creating community demand for programmes and feeding into longer-term strategies. Different contexts will need different strategies. Initially in Concern's programme in South Wollo Ethiopia, paid outreach workers conducted all community mobilisation and follow up activities. Six months into the programme, a huge network of community volunteers (CV's) was identified by the community themselves. Much effort was put into training the 2,890 CV's to do accurate screening and to pass on health education messages. Whilst the network has been running very well for 2 years now, challenges to long term viability remain: incentives, workload, linkages and ongoing support.

Efficacy and effectiveness of community-based treatment of severe malnutrition

Ann Ashworth, London School of Hygiene & Tropical Medicine, UK

Thirty-three studies of community-based rehabilitation were examined and summarised for the period 1980-2005. The four main delivery systems were day-care nutrition centres, residential nutrition centres, primary health clinics, and domiciliary care with or without provision of food. Eleven (33%) were considered effective using the criteria set for this review (mortality <5% and weight gain $\geq 5\text{g/kg/day}$). Of the sub-sample of community-based studies reported since 1995, eight out of thirteen (61%) were effective. No examples were located of effective community-based rehabilitation programmes for severe malnutrition operating within routine health services without external support.

Findings from these studies were:

- With careful planning and resources, all four delivery systems can be effective for community-based treatment of severe malnutrition;
- It is unlikely that a single system will suit all situations;
- High energy intakes (150-200 kcal/kg/day), high protein intakes (4-6g/kg/day) and provision of micronutrients are essential for success;
- Rehabilitation at home can be achieved by families using their own resources to make specific mixtures of family foods, or by giving them ready-to-use therapeutic foods (RUTF);
- Rehabilitation at home with family foods is more cost-effective than inpatient care. The cost-effectiveness of RUTF vs. family foods has not been studied.

There are strong justifications for establishing community-based rehabilitation for severe malnutrition within routine health systems. It facilitates early discharge from hospital and provides continuity of care, and offers an alternative to inpatient care for severely malnourished children who are clinically well and have a good appetite. It can benefit children by reducing exposure to hospital-acquired infections. It can benefit families by reducing the time carers spend away from home and the risk of possible neglect of siblings, and by reducing opportunity costs. It may benefit the health system through capacity building and be the catalyst for strengthening nutrition activities within clinics in relation to both treatment and prevention of malnutrition.

The conclusions were:

- Where children have access to a functioning primary health care system and can be monitored, the rehabilitation phase of treatment of severe malnutrition should take place in the community rather than in hospital;

- If carers can make energy- and protein-dense food mixtures at home, then domiciliary care would seem the best delivery system for community-based care. If carers cannot make such foods, then provision of RUTF could be considered;
- For routine health services, the cost of RUTF, logistics of procurement and distribution, and sustainability need to be carefully considered.

Community-based nutritional rehabilitation without food distribution: Experience from Bangladesh

Tahmeed Ahmed, ICDDR, Dhaka, Bangladesh

The 4th Millennium Development Goal is to reduce by two-thirds the mortality rate among under-five children. This will not be possible unless the management of severe malnutrition is simplified and the excessive death rates reduced among the 67 million severely underweight children currently living in the world. Bangladesh has a huge burden of severe malnutrition; the extrapolated figure of severely wasted under-five children is 0.25 million. Published data on community-based management of severe malnutrition in Bangladesh, however, is sparse.

In order to find the most cost-effective method of treating severely malnourished (SM) children, Khanum et al did a randomized controlled trial in the Children's Nutrition Unit (CNU) in Dhaka. They evaluated three treatment options, 1) inpatient: children admitted with mothers until they achieved weight-for-height (WH) 80% (n=173), 2) day care: children stayed in the Unit from morning till evening until achievement of WH 80% (n=134), and 3) home care: children treated under the day care facility for 7 days, visited at home weekly for one month and then twice monthly until WH 80%; only multivitamins and iron were provided but no food supplements (n=130). Mothers received structured lessons during their stay in the CNU which was reinforced by home visits. Rate of weight gain was lowest in the home care group, 4 g/kg per day, compared to 11 g/kg and 6 g/kg per day in the inpatient and day care groups, respectively. Children in the home care group also took the longest time to achieve WH 80% (median 35 days). Case fatality rates were similar ranging from 3.5%-5%. Institutional costs up to achievement of WH 80% were highest for the inpatient group (USD 156 per child) and lowest for the home care group (USD 29 per child). Although the parental costs were highest in the home care group, this was the preferred option as 67% parents voted for this option at the end of the study. Follow-up at the end of one year of completion of the study showed that the groups were similar in growth.

More recently in Dhaka, we tested the hypothesis that after an initial period of management in a nutrition unit, severely malnourished children recovering from an acute illness can be managed at home using local, low-cost diets. We compared growth, days to achieve oedema-free WH > 80% and rate of weight gain of children managed by home-based nutritional rehabilitation (NR) (with follow-up at home or outpatient department) vs. management in an inpatient NRU by a randomized controlled trial. Children in the NRU group stayed in the Unit until achievement of WH >80%. Children in the home and OPD groups stayed in the NRU for 7 days and then discharged without any food supplements but with multivitamin, iron-folate and zinc supplements. Children in the home group were visited at home by health workers while the OPD children were asked to come to the OPD for follow-up until WH 80%. For NR, a standardized dietary protocol is used that

is based upon two locally available, culturally acceptable, and inexpensive diets in which vegetables form the principle source of protein. *Khichuri* and *halwa* are such vegetable-based defined diets (reference: *Online extra. Serving up solutions for malnourished children. National Geographic Magazine, 2002*). *Khichuri* is a cooked gruel made of rice, lentils, vegetables and soy bean oil. *Halwa* is a semi-solid diet prepared from flour, lentils, molasses and soy bean oil. In addition to these semi-solid diets, the children also receive a locally prepared milk-based diet that is tapered down gradually. By the time the children are ready to go home, they are almost exclusively on *khichuri* and *halwa*.

More than 55% of 225 children enrolled in the trial (75 children in each group) had pneumonia while 15% were septicaemic on admission. Only one child died (of a hospital-acquired infection; belonged to the NRU group). Overall, 70% of children completed the study and achieved WH >80%. The number of children who left against medical advice was highest in the NRU group. Among those who completed the study, those in the OPD group took the longest time (median 37 days) compared to 17 and 20 days in the NRU and home groups. Rate of weight gain was also lowest (7.5 g/kg per day) in the OPD group, 10.4 g/kg and 11.6 g/kg per day in the home and NRU groups respectively.

Home-based NR coupled with home visits for follow-up is an effective alternative to hospital-based NR of severely malnourished children recovering from acute illnesses. NR can be achieved at home using locally available, low-cost diets. Such an option is sustainable and can also prevent malnutrition among siblings who consume the same diet.

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Is it possible to achieve the nutritional density of F100 or RUTF with local foods?

Nicole Darmon, Inserm / Inra, Marseille, France

The aim of the present study was to test whether it is possible to make at home, with local foods only, a diet that reaches the nutritional density of F-100 or RUTF.

A food database that included 26 foods previously identified⁷ as the foods most often consumed by children in poor regions of the world, their nutrient composition and the maximum portion sizes that can be reasonably recommended for 6-24 months non breastfed children was used. A nutrient-by-nutrient and food-by-food approach was first applied to assess the number and type of foods, among the 26 available, that reach or exceed the nutrient density of F-100. For each nutrient, the richest food sources were also identified and quantified. Then, a multivariate approach based on linear programming⁸ was used to test whether it was possible to design an F-100 like diet with local foods only. The 26 available local foods were used as food variables in a simple linear programming model that used the energy and nutrient densities of F-100 as nutritional constraints and the maximum portion sizes acceptable by children as palatability constraints. To ensure moderate bio-availability for minerals, a constraint which limited the phytate/zinc molar ratio to 15 was also introduced. The total energy of the designed diet was fixed equal to 1,000 kcal and its total weight was kept below or equal to 1,000 g. This total weight was minimised, which means that nutrient density was maximised.

Only two foods, namely spinach and chicken liver, reached the density level of F-100 for zinc. Likewise, only two foods reached the desired nutrient densities for vitamin E and for copper. Moreover, using the locally available foods in portion sizes that remain below the maximum acceptable by young children, it was not possible to design a diet that reaches the energy and nutrient densities of F-100. The constraints that made the model infeasible were the constraints on vitamin E, thiamine, riboflavin, niacin, Zn and Cu.

Identification of limiting nutrients should be done before recommending the use of local foods for feeding young children, in particular if they are malnourished or at risk of malnutrition. Both a nutrient-by-nutrient/food-by-food approach and a multivariate approach with linear programming identified vitamin E, thiamine, riboflavin, niacin, zinc and copper as potential limiting nutrients when aiming at designing an F-100 like diet with locally available foods. Our results suggest that it is theoretically possible to design F-100 like diets based on local foods, when supplements and/or fortified foods containing the limiting nutrients are included in these diets. Field studies are

⁷ Dewey KG, Cohen RJ & Rollins NC. *Food Nutr Bull.* 2004;25:377-402.

⁸ Briend A, Darmon N, Ferguson E & Erhardt JG. *J. Pediatr. Gastroenterol. Nutr.* 2003;36:65-71.

needed to assess the clinical efficacy and the feasibility of this proposal, in terms of acceptability, practicability, sustainability, cost, nutrient bioavailability, and weight gain.

Protocols used in emergency and development community-based therapeutic care

Steve Collins, Valid International, UK

The author estimates that acute malnutrition is associated with up to 5 million childhood deaths each year, including approximately 1.7 million deaths associated with severe acute malnutrition. Despite this vast burden of preventable mortality and morbidity, the treatment of acute malnutrition has been largely disregarded by the child survival movement. This disregard has arisen largely because the current clinically-orientated approach to severe acute malnutrition, with a focus on inpatient nutritional and medical protocols, has not delivered affordable population-wide benefits. Over the past five decades, the median case fatality from severe malnutrition has remained unchanged and is typically 20-30%, similar to the situation seen in the 1950s. The proportion of severely malnourished children who receive treatment is also very low and the vast majority of cases never access care. The recent response to these failings has been a focus on improving the clinical treatment of individuals. However, the quality of nutritional & medical protocols and the intensity of individual clinical care are not the main factors limiting the effectiveness of programs. As a result, these changes have not increased the impact of therapeutic programs.

Community-based Therapeutic Care is an approach to the management of severe malnutrition that has evolved in response to these problems. Community-based Therapeutic Care (CTC) prioritises public health principles such as high programme coverage, reducing barriers to access and promoting early presentation of cases. In practice, this requires a shift away from the individually tailored clinical model of care for children suffering from severe malnutrition, towards a more “mass treatment” approach. Programmes are designed to decrease barriers to accessing treatment, thereby facilitating early presentation of severe cases before they develop life threatening complications that require intensive individualised treatment.

The CTC response to severe malnutrition is based upon very simple outpatient therapeutic protocols that can be delivered safely from primary health facilities by the existing staff. This allows programmes to be more decentralised, thereby reducing the opportunity-costs associated with treatment. It also reduces the capacity bottle-necks associated with a reliance on inpatient care, allowing the existing infrastructure to treat larger numbers of cases. To promote early presentation CTC programmes invest resources in engaging with the population in order to develop local understanding and participation. To improve case finding, they use only Middle Upper Arm Circumference, for screening and admission.

The existence of medical complications rather than the severity of malnutrition dictates whether patients are admitted into inpatient care. Only cases with severe medical complications or those with severe oedema receive inpatient care and these patients are discharged into the outpatient programme as soon as their medical complications are under control and their appetite has returned. All other cases, including all cases of marasmus without medical complications and all cases of mild to moderate cases of oedematous malnutrition without medical complications, are treated solely as outpatients with no phase of inpatient care. Outpatient treatment protocols are very simple and can be safely implemented by primary health care workers with only minimal additional training.

MSF perspective on community-based treatment of severe malnutrition

Saskia van der Kam, Médecins sans Frontières, Netherlands

The possibility of treating uncomplicated severely malnourished cases in an ambulatory set-up is very successful, showing low mortality rates and good cure rates. Since 2001 MSF has treated more than 100,000 severely malnourished patients who often started, and at least finished their treatment, in an ambulatory feeding programme.

Lessons learned by the various MSF programmes are:

- MSF is using the terminology of Ambulatory Treatment of Severe Malnutrition to mean that the patient comes to the centre on a weekly basis.
- The ambulatory treatment set-up is a successful addition to existing programmes; the exact design depends on the context.
- Ambulatory Treatment can be implemented successfully on small scale (a few patients) and on a (very) large scale exceeding 1,000 cases in one programme.
- Community engagement is necessary for good coverage. In emergencies working with volunteers is complicated and not a priority.
- Security issues might interfere with access resulting in defaulters and low coverage.
- An efficient patient flow (short waiting times) and extensive information to the carer is essential for high coverage and low defaulter rates.
- A test for appetite is crucial before admission in the ambulatory feeding programme.
- A weekly follow up of patients in the ambulatory feeding centre is sufficient. Only special cases are eligible on medical or social grounds for home visits by health workers.
- An outreach system is essential for absentee tracing and active case finding.
- Standards and definitions concerning functioning and outcome indicators of the programme should be agreed upon internationally to allow for quality control across programmes.
- For complicated cases inpatient treatment should be available. Knowledge and skills on treatment of severe malnutrition with complications should be actively maintained to ensure access to good in-patient care.

The medical and dietary protocol used for home-based therapy for severe childhood malnutrition in Malawi

Mark Manary, Saint Louis Children's Hospital, USA

A successful operational programme using home-based therapy with ready-to-use food (RUTF) to treat severe childhood malnutrition is ongoing in Malawi. Malawi is a poor nation without acute climatic or political crises where about 10,000 children seek treatment for severe malnutrition annually; 75% of these children have oedematous malnutrition.

Locally produced RUTF is well suited for home-based therapy because it is an energy and nutrient dense food equivalent to F-100, it is a hygienic food, having a low water content and not supporting the growth of bacteria, it does not spoil under ambient tropical conditions for at least 4 months and it requires no cooking prior to consumption. Severely malnourished children eligible for home-based therapy must have a history of a good appetite given by the primary caretaker and they must demonstrate this by consuming a 30 g test dose of RUTF. The extent of their oedema must be < 0.5 cm of pitting on the dorsum of their feet. Children with anorexia or more extensive oedema are admitted to an inpatient unit until they meet these criteria for outpatient therapy. Children receiving home-based therapy are dispensed enough RUTF to provide 730 kJ/kg/d (175 kcal/kg/d) for fourteen days, and asked to return for follow-up fortnightly. Children receiving therapy at home who develop anorexia or seem to be more ill are asked to return whenever these symptoms are noticed. Recovery is defined as reaching 85% weight-for-height with persistent resolution of oedema. Children are discharged from the therapeutic programme when they have received eight weeks of RUTF or if they reach 95% weight-for-height, whichever occurs first. The purpose of discharge if the children reach 95% weight-for-height before eight weeks is to prevent excessive weight gain. Those children who did not reach 85% weight-for-height after eight weeks of home-based therapy were referred to the medical clinic for evaluation for chronic illness. The programme is being administered at 15 sites by a resident nurse's aid at each site. In 2004 and 2005 about 6,000 children have been treated in this manner and 91% of these children have recovered.

Determination of appetite is used as a clinical screening tool for the presence of serious bacterial infection, the most common complication necessitating inpatient care in this population. Appetite was chosen on the basis of smaller study of 75 children carefully tested for serious bacterial infection, and all 22 children with a good appetite did not have evidence of a serious bacterial infection. There is a need to validate the use of appetite as clinical indicator of infection in a larger study of home-based therapy patients and/ or to consider adding an oral antibiotic to the regimen. Home-based therapy with RUTF can successfully be used in an operational programme without the support of a research team.

Home-based therapy for severe malnutrition in the HIV infected children in Malawi

Mark Manary, Saint Louis Children's Hospital, USA, and MacDonald Ndekha, University of Malawi College of Medicine, Malawi

Malawi is afflicted by the HIV epidemic of southern Africa, the seroprevalence rate of the population is about 15%. Childhood malnutrition is a major health problem as well, the prevalence of severe childhood malnutrition being 2.5% of 1-3 year olds. These 2 public health problems intersect at facilities which treat malnourished children; where 10-25% of children treated for malnutrition are infected with HIV.

In order to effectively address the needs of HIV infected, severely malnourished children, strong linkages between HIV care programmes and therapeutic nutrition programmes must be developed. There are no clinical characteristics which can reliably identify malnourished, HIV infected children; to identify these children at the onset of nutritional therapy HIV testing is needed. Once nutritional therapy has begun, the HIV infected child is more likely to have poor weight gain, and more fever, cough and diarrhoea. Clinicians should suspect HIV infection in this clinical scenario in geographic areas where HIV infection is common. HIV infected children will require longer treatment in therapeutic nutrition programmes to recover, in Malawi this was 9 weeks on average, compared to 6 weeks for children without HIV. Children with and without HIV have been effectively treated with ready-to-use therapeutic food (RUTF). Wasted, HIV infected adults in Malawi have found RUTF acceptable as a supplementary food, and exhibited greater rates of weight gain than with traditional cereal-legume supplementary foods.

In summary home-based therapy for childhood malnutrition in HIV endemic areas is effective for children with HIV, clinicians may find HIV infected children indistinguishable from other clients and HIV care programmes need to work closely with nutritional therapy programmes for these children to achieve an optimal outcome.

Community-based management of severe malnutrition in the context of a high HIV prevalence

Paluku Bahwere, Valid International, Malawi

Community-based therapeutic care (CTC) is a community-based model for delivering care to malnourished people. CTC aims to treat the majority of severely malnourished people at home, rather than in therapeutic feeding centres. In countries heavily affected by HIV, the caseload of therapeutic feeding programmes includes large number of HIV infected children. In this paper we present findings from Dowa programme in Malawi with implications in programming for care and support of children and adults infected with HIV.

We found that the uptake of VCT when integrated into CTC was 94% and 60% among children and carers respectively, far higher than the uptake of VCT in the rest of Malawi. Integrating Voluntary Counselling and Testing (VCT) into CTC will help decentralize the activity and will increase VCT coverage. This is an important finding as the Malawi Demographic Health Survey 2004 found that 83.2% of Malawian never undertook VCT.

The nutrition recovery rate on the standard CTC protocols without antiretroviral therapy was 59.1% and the relapse rate approximately 15 months after discharge was 14.3%, indicating that initiation of ART could be reserved for children who do not respond to CTC, and may be delayed for children who are able to recover on standard nutritional protocols alone. The relapse rate in HIV-negative children was much lower at 2.5%, indicating that HIV-positive children require more systematic post-discharge nutrition support.

In conclusion, CTC is a potentially valuable non stigmatizing entry point for providing HIV testing and care in the community. The CTC approach has several important advantages over traditional inpatient therapeutic care, including earlier intervention, greater coverage, and increased accessibility. All of these characteristics are particularly important for providing timely care to HIV-exposed and vulnerable children, particularly orphans. Research is required to identify the reasons and possible solutions for slow recovery and high relapse rate.

Social aspects of community-based management of severe malnutrition in the context of high HIV prevalence

Mickey Chopra, School of Public Health, University of the Western Cape, South Africa

The introduction and scaling up of community-based RUTF interventions must take into account the broader social and economic context especially across Sub-Saharan Africa (SSA). The plight of many countries in SSA is well documented: poor economic development, persistence of high levels of poverty and disease and widening inequalities. Southern Africa now boasts five countries with the most unequal distribution of wealth in the world. In this region the Human Development Index was lower in 2002 than in 1990 in all countries, apart from Mauritius and Mozambique. Much of the intra-country inequalities occurs at the village or community level and women in particular are losing out. Female headed households have an average of 40% less land than male headed households. Increasing responsibilities as income earners and carers is further exposing them to risks of infectious diseases (such as HIV and TB) as well as occupational hazards. Morbidity and mortality rates for women have increased dramatically primarily due to HIV/AIDS. For example, the life expectancy of South African women has dropped to below 60. Support for women is urgently required.

However limited evaluation of the introduction of community care programs suggests that many of these programs have increased the vulnerability of women as they take on additional caring responsibilities with little extra resources and support. For example, 45 out of 48 palliative programs assessed across Africa reported inadequate drugs for management of pain relief – a fundamental requirement for such programs. Increasing physical stress (it is estimated that it requires 23 extra buckets per day of water to care for an AIDS patient), psychological and emotional stress, economic stress (many programs pay nothing or very little to local women to perform caring tasks) and social stress have been identified as some of the consequences of the introduction of new programs. The shift of burden of care from the formal state sector to the informal family or poorly regulated private sector relying upon further exploitation of women seems to mirror experiences from the North with the de-institutionalisation of elderly and mental health care.

The consequences for children in SSA of the increasing vulnerability and ill-health of women are devastating. The death of a mother increases the risk of her children dying threefold in SSA. Taking these considerations into mind leads to a number of important recommendations for the scaling up of community-based RUTF programs. Firstly, careful consideration should be given to the re-imburement of local women who are given extra responsibilities due to the introduction of the program. Secondly, interventions to support mothers and carers of severely malnourished children should be prioritized. Thirdly, in many settings severely malnourished children have a

high chance of being HIV infected. Integration with HIV testing and treatment programs should be sought. Finally men and boys should be encouraged to take on some of the caring responsibilities.

Key issues in the community-based management of severe malnutrition

Steve Collins, Valid International, UK

There are three major factors determining the impact of community-based programs for the treatment of severe malnutrition; the degree of access to the service, the local population's levels of understanding and acceptance of the service provided, and the consistent delivery of simple outpatient therapeutic protocols (a ration of Ready to Use Therapeutic Food, a basic oral antibiotic given to all admissions at the start of treatment, vitamin A, folic acid, de-worming and if appropriate, anti-malarials). The accessibility of services depends on the geographical proximity of the access points and on the socio-economic costs to people and families using the service. The degree of understanding and acceptance of the local population is determined by the efforts and resources put into engaging and mobilising the population. The consistent delivery of Outpatient Therapeutic Programmes (OTP) protocols is dependent on the resources, organisation and supervision of the local primary health care system.

If programs are designed to satisfy all these basic requirements then cases of severe malnutrition tend to present early. If cases present early, they are simple to treat and community-based management has high recovery rates. If, on the other hand, access to treatment is difficult, the population does not understand the service provided, or OTP services are not implemented consistently, cases tend to present later. This leads to treatment being more difficult and less successful, with a higher proportion of cases requiring costly inpatient treatment. The result is lower rates of recovery and coverage and less cost-effective of programs.

The outcomes from 20,976 cases of severe malnutrition presenting to 21 Community Therapeutic Care (CTC) programmes implemented in Malawi, Ethiopia North & South Sudan between 2001 – 2005, indicate that community-based programs can attain excellent rates of recovery and coverage. These programmes achieved recovery rates of 78.1% and mortality rates of 4.3%. Coverage rates were approximately 73%. 74% of the severely malnourished children who presented were treated solely as outpatients and this proportion increased in the later programs and was associated with improvements in recovery rates. Initial data indicate that these programs are affordable with the costs-effectiveness of emergency CTC programs varying between \$12 and \$132 / year of life gained. The density and prevalence of severe malnutrition, numbers of severely malnourished treated, the infrastructure, accessibility and the maturity of the emergency intervention, are important determinants of costs. This range of cost-effectiveness compares favourably with other mainstream child survival interventions such as vitamin A provision, oral rehydration therapy for diarrhoeal disease and treatment of acute respiratory tract infection. The development of local production of Ready to Use Therapeutic Food, using new cheaper recipes based upon locally available grains and pulses should further reduce costs. The

high cost efficiency of CTC programs is due to the precise targeting of resources towards severely malnourished children who are at a high risk of dying.

Although CTC interventions are relatively recent, several emergency CTC programs are now transitioning towards implementation by the local health infrastructure. Initial evidence indicates that high recovery and coverage rates can be maintained during this process.

Sustainability and integration of community-based management of severe malnutrition in existing programmes

Valerie Gatchell, Concern, Ireland

Community-based Therapeutic Care (CTC) is the management of severe malnutrition through community mobilisation, supplementary feeding, outpatient therapeutic feeding and in-patient care for those with medical complications. Concern piloted CTC with the technical support of Valid International in Ethiopia in 2000. Based on the increased effectiveness of CTC Concern has expanded CTC programmes into Malawi, S. Sudan, N. Sudan and Niger. These programmes have contributed to a large evidence base demonstrating the effectiveness of the CTC model for the treatment of severe malnutrition. While most of Concern's CTC programmes started as an emergency response, over time they have developed into longer term, transitional programmes addressing severe malnutrition in non-emergency contexts, particularly Malawi and Ethiopia. Concern has most recently engaged in the development of a CTC programme to complement a chronic nutrition programme in Bangladesh.

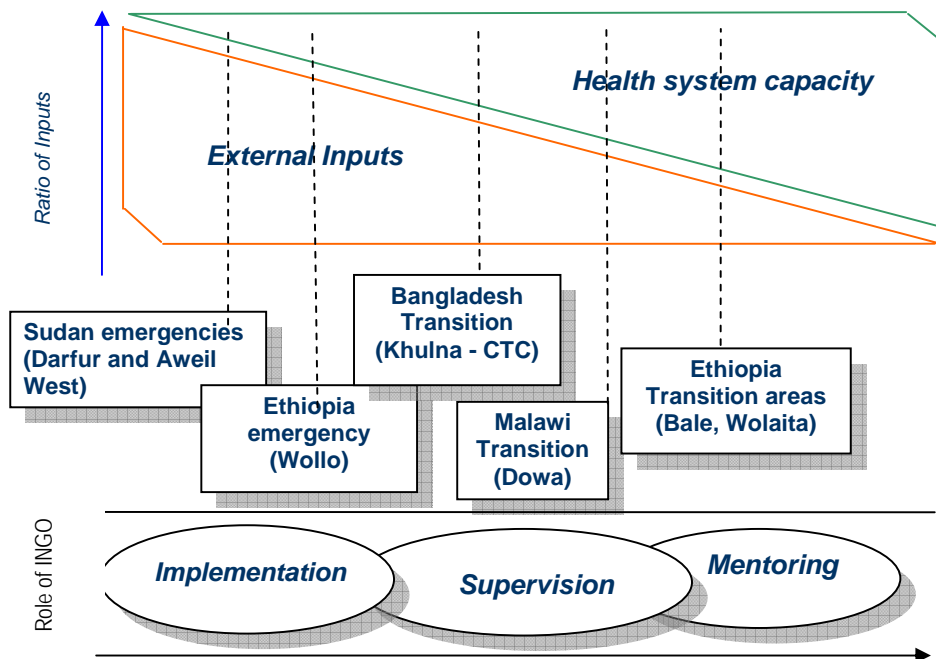
The key issue arising from experience to date is the potential for developing sustainable CTC programming. In the context of CTC, Concern defines 'sustainability' as a focus on 'strengthening the capacity of the health systems to function effectively with minimal external input.

Key components of a sustainable CTC programme include:

- CTC services (OTP, SC and community outreach) integrated into and managed by existing health infrastructure;
- Capacity of MOH to monitor the situation and respond to increasing levels of malnutrition;
- Access to affordable and appropriate Ready-to-Use Therapeutic food.

While integration is a key requirement for sustainable programming, sustainability further includes management of services by the existing health system. Key national level requirements for sustainable programmes include acceptance of community-based treatment protocols at a national level, a functioning primary health Care System, national training and capacity building of health personnel as well as a nutrition monitoring and/or surveillance system. Additionally, at the community level active screening and community participation are fundamental to sustaining programming. Thus, mechanisms for on-going support, supervision and motivation of community activities are crucial. However, the mechanism of response can be viewed as a ratio of external inputs and health system capacity based on the prevalence of severe malnutrition (see diagram below). So in a situation with a high prevalence of severe malnutrition and low capacity of the existing health system, external response and inputs would be relatively significant. However in

an area with a strong health system capacity and a high prevalence of malnutrition, external support would be more limited.



The role of the external agency support would be seen as one of three categories: direct implementation, supervision or monitoring. This could be a linear process but not necessarily as it is recognised that in several areas characterised by recurring nutrition emergencies, external support could vacillate between direct implementation and mentoring based on the level of severe malnutrition and the capacity of health systems to respond. Concern's experience in Malawi and Ethiopia has gone from emergency response to one of supervision, capacity building and training support of the Ministries of Health and national advocacy for CTC. Lessons learned from initial programmes in Ethiopia highlight the challenge of withdrawing large levels of implementation support over time as the prevalence of malnutrition declines. As such, the most response to the nutrition emergency in Bale in July 2005 piloted an approach of training and supervision from the outset. In Bale, Concern provided training and supervision through the input of 3 experienced, local Concern staff to build the capacity of the MOH to implement CTC through the existing health services. To date standard indicators meet SPHERE standards and Concern staff will be withdrawn from the programme area in December and the MOH will continue to run CTC services with support from Concern on a request basis. Likewise, in Malawi Concern is expanding CTC coverage area with the MOH through a mobile capacity building, training and supervisory service on CTC in addition to facilitating RUTF procurement. Our experiences from Malawi and Ethiopia

suggest the potential sustainability of CTC while also highlighting key issues at global, national and community level that need to be addressed for this to be realized.

In order to facilitate the sustainability of CTC at the national level it is recommended that at a global level, international policy and protocols are revised to include community-based protocols for the treatment of severe malnutrition. Additionally there is a need for greater funding to support primary health care services. Finally, there is a need for internationally recognised standards for RUTF production and composition. At a national level, community-based management of severe malnutrition will be more acceptable if national protocols are revised to include community-based protocols. Another key component to national sustainability includes the incorporation of training on the community management of severe malnutrition for all levels of health workers. Additionally, national and regional contingency plans would facilitate a quicker, more planned response to increasing levels of severe malnutrition. Finally, international NGO support for CTC programmes needs to have a medium outlook on integrated programming with a wider health perspective, ultimately moving towards supervision and mentoring of existing health system, the development of contingency planning and an overall commitment to quality and standards.

Looking Ahead: Success and Sustainability for Community Therapeutic Care in Niger

Frances Mason, Save the Children, UK

This presentation is based on the work of Save the Children UK in Niger and on the research of Valid International consultants Montse Saboya and Saul Guerrero.

According to the latest UNDP Human Development Index, Niger is the poorest country in the world. Its health care system is exposed to dramatic under-resourcing, resulting in limited drug provision and staffing. A current cost recovery system is in place which further hampers the access to health care.

Save the Children UK began working in Niger during the food crisis in recent months. Niger experiences malnutrition all year round, with high peaks during the hunger gap and hence requires the implementation of Community Therapeutic Care (CTC) to cope with the waves of increasing and decreasing rates. The SCUK programme results for the outpatient treatment for the severely malnourished (OTP) for the period August – October are as follows:

Table 1 Results of SC-UK outpatient therapeutic programme August – October 2005

	Total Admission	% recovered	% defaulter	% died	% transferred	Total Exit
OTP	1935	79.3	10.1	2.7	7.9	895

Some practical elements required for sustainability of the programme following the departure of INGO input are already being considered, however with such poor access to health care and discussions on long-term funding for health care still at a very early stage, the potential remains very limited.

The arrival of SC UK coincided with the revision by the MOH and UNICEF of the National nutrition protocols, focusing on CTC. While these only focus on the role of the MOH as the provider of nutrition care and miss out on the crucial potential contribution of community networks, it is still a positive initial step. CTC is provided through the set up of CRENAM⁹ and CRENAS¹⁰ at the health centre level and CRENI¹¹ at the district hospital level. MOH staff have already been trained (by WHO and other agencies) for outpatient treatment of severe malnutrition and at a

⁹ Centre de récupération nutritionnelle ambulatoire pour les enfants modérément malnourris (ie Supplementary Feeding Programme)

¹⁰ Centre de récupération nutritionnelle ambulatoire pour les enfants sévèrement malnourris (ie Outpatient Therapeutic Programme)

¹¹ Centre de récupération nutritionnelle intensif (ie Stabilisation Centre)

regional level, the MOH has already requested that NGOs start to consider a joint strategy for phase-out which encompasses the consideration of absorbing some of the INGO trained staff within the ministry. Other elements considered crucial to the sustainability of CTC provision beyond INGO input include the local production of RUTF, provision of drugs and strong monitoring and evaluation. A factory in Niamey which has been set up under a franchise with Nutriset has the potential capacity to provide sufficient RUTF for current needs within the country. The cost of this is similar to that provided by Nutriset (excluding transport costs). Dried skimmed milk, CMV (micronutrient mix) and the packaging however, are still all imported. Heavy reliance on drug provision rests with the UN while monitoring and evaluation remains very weak.

Outside of the MOH, strong community networks exist. The payment of salaries, however small is unlikely to be sustainable. Much of the development work in Niger has been based on creating community participation, for example in water and agricultural programmes. Hence very careful consideration must be made of ways to support and reward community volunteers and not to over-exhaust their means in terms of time and resources. The most effective approach is to work with volunteers at the village level, whereby the volunteer is known to the community and can be visited by carers of malnourished children, hence minimising their time involvement and ensuring their ownership of the programme. Existing 'animatrices', many of whom already have some training in health promotion, are strong candidates for case-finding, while the local village crier and local radios can be used for sensitisation.

Per capita bilateral ODA (Overseas Development Assistance) to Niger in 2003 was comparable with that of Tanzania and Uganda. The proportion allocated to health for the year was only 5% (compared to 10% and 20% for the other countries respectively). At this time 35% of the ODA was allocated to payment of debts. Since the Gleneagles meeting this year, this debt has been cleared and is reportedly to be allocated to the four Poverty Reduction Strategy Papers priorities, one of which is improvement in access for the poor to quality social services including primary health care. Even if this occurs, this is still unlikely to be sufficient to ensure accessible treatment of severe malnutrition to all under 5s. However, a WHO visit is being undertaken (Nov 05) to initiate consideration for support in the provision of free health care to vulnerable groups at regional level.

Hence to further enhance the sustainability of CTC within Niger, the following issues particularly need to be addressed:

- WHO / UNICEF need to support access to free nutrition and health care for under 5s.

- UNICEF should support the Niger MOH to include community participation within the national nutrition protocols.
- INGOs/UN must further work with the MOH on staff training for CTC.
- INGOs must ensure support to 'volunteers' within the community.
- UNICEF / WFP could consider more cost-effective support to alternative national companies for RUTF production.

Local production and provision of ready-to-use therapeutic food for the treatment of severe childhood malnutrition

Mark Manary, Saint Louis Children's Hospital, USA

The recent success of home-based therapy has been seen in conjunction with the availability of a novel food, ready-to-use therapeutic food (RUTF). RUTF is powdered ingredients embedded in a lipid rich paste, resulting in an energy dense food that resists microbial contamination. As the name implies, RUTF does not need to be prepared in any way prior to consumption, making it practical for use where cooking fuel and facilities are limiting constraints. RUTF has a very low water activity, thus it is impossible for significant bacterial growth to occur in these foods. This allows locally produced RUTF to be safely stored at ambient tropical conditions for 3-4 months. RUTF has a very high energy density, about 23 kJ/g (5.5 kcal/g).

The production of RUTF is based on maintaining the lipid elements of the mixture as a viscous liquid and suspending the carbohydrate, protein and micronutrient particles within this. To achieve this suspension, the lipid elements should be mixed first and then other ingredients added. Small particle size of the ingredients is necessary, as well as keeping water out of the production process. Because RUTF does not support the growth of bacteria, the production area needs to be clean and free of pests, but not routinely sanitized. These standards are easily achieved throughout the developing world. Food grade milk powder, peanut butter, vegetable oil, and sugar are the principle ingredients in RUTF. A micronutrient mix is currently commercially available (Nutraset, France) that adds the necessary vitamins and minerals to RUTF to yield the same composition as is recommended for therapeutic food by the WHO. The micronutrients are added to the RUTF with the protein and carbohydrate components. Small scale local production of a few hundred kg RUTF/week can be done in a small bakery size mixer for use at a single site. Moderate scale local production of 1-2 tons RUTF/week can be achieved using industrial machinery used for making peanut butter in conjunction with a local business. Large scale RUTF production utilize factories dedicated to RUTF production can produce several tons RUTF/week. Quality control is achieved using peanuts that have a very low content of aflatoxin, storing the other ingredients in a manner that bacterial contamination is minimized and carefully following the recipe. Quality control is checked by complying with international standards for food production and testing the food.

Recipes for therapeutic food with other ingredients have not yet been sufficiently tested for quality or therapeutic effectiveness, but may be important in the future. Active research questions regarding the local production of RUTF centre around alternatives to the single commercially available micronutrient mix, alternative recipes and systematic cost analyses of each scale of production.

Ethiopia experience in the management of severe malnutrition (2003-2005)

Sylvie Chamois, UNICEF, Ethiopia

The severity of the 2002-3 crises in Ethiopia and the below-satisfactory level of response to severe malnutrition have led the international community and the Government to re-think the overall problem of nutrition in Ethiopia. Even in non-emergency situations, the number of children suffering from severe malnutrition is unacceptably high. In 2005, it was estimated that 35,000 to 105,000 children were severely malnourished. Numerous reviews of the determinants of malnutrition and the emergency response have increased the recognition from the Government that nutrition and malnutrition is not only a food problem but a public health problem needing full attention. This unprecedented positive development within Government resulted in the following significant actions:

- The adoption of the MDGs¹² and especially the endorsement of the National Child Survival Strategy (2004) placing nutrition in the foreground.
- The introduction of the EOS¹³ for Child Survival in 2004. This strategy addresses the immediate causes of malnutrition. The identification of thousands of children suffering from severe malnutrition has led to an increased demand from the community level for therapeutic feeding support. It was then impossible to deny the problem of severe malnutrition in Ethiopia.
- In 2003-4 the MOH developed three national guidelines on nutrition and introduced the management of severe malnutrition into the Essential Health Services Package (2005).
- The government of Ethiopia developed its National Nutrition Strategy in 2005.
- Alongside this positive national environment to address malnutrition in its entirety, UNICEF adopted the following strategies to scale up therapeutic feeding capacity in Ethiopia:
 - Advocacy and adoption of a national protocol for the management of severe malnutrition (June 2003). At this stage, the adhesion of the paediatric community was crucial, which is why international experts were brought in Ethiopia to undertake this task.
 - Support of the integration of the management of severe malnutrition into health facilities. This includes: 1/ the combination of in and outpatient management of cases to dramatically improve the programme coverage; 2/ the capacity-building of health professionals; 3/ the collaboration with medical universities to introduce the protocol into the curriculum; 4/ the procurement of therapeutic products, essential drugs and basic equipment for the

¹² MDGs: Millennium Development's Goals

¹³ The Enhanced Outreach Strategy (EOS) provides a child survival package twice a year of vitamin A supplementation, de-worming, measles catch-up, nutritional screening of 6.7 million children and referral to supplementary (WFP) or therapeutic feeding programmes (where appropriate).

Therapeutic Feeding Units (TFU); 5/ the recruitment of regional nutritionists for direct technical assistance; 6/ linkages with other initiatives such as the Essential Nutrition Actions (ENA), the EOS for Child Survival, institutions dealing with HIV/AIDS and TB patients; 7/ The strengthening of the ENCU¹⁴ for improved co-ordination and surveillance.

The capacity for the treatment of severely malnourished children increased from 3,500 per month in 2003 to 13,400 in 2005. It is important to note that no incentive/ per diem for the health professionals is provided as this task is included in the Essential Package of Health services. A typical integrated TFU involves 1-2 health staff treating 10 to 30 inpatients and up to 100 outpatients with RUTF¹⁵.

The experience drawn since 2003 has revealed the following weaknesses and, therefore, challenges in the management of severe malnutrition: 1/ TFUs have the tendency of admitting only children under five years of age when the national protocol includes all age groups. Active severe malnutrition case finding should include all age groups, at least at health facility level; 2/ the community mobilisation is very weak where there is no NGO involvement, thereby reducing OTP to weekly or fortnightly RUTF distribution; 3/ the monitoring and evaluation component is not well developed and supervision and reporting is weak in the integrated settings; 4/ logistical and financial resources are still not integrated into MOH regular budgets systems.

The main challenge now is to sustain and strengthen the therapeutic feeding capacity while at the same time building the overall national capacity to address nutrition in all its aspects. The way forward should be:

- Increase nutrition and disease prevention activities to reduce the severe malnutrition case load.
- Advocate for an increased allocation of funds to the Health sector.
- Develop the national nutrition capacity and integrate the national protocol into the nursing schools' curriculum.
- Support the local production of Ready to Use Therapeutic Food to reduce the treatment cost.
- Continue to scale up integrated therapeutic feeding capacity to meet the important immediate and on-going nutrition needs of at-risk Ethiopian children.
- Strengthen community involvement and participation – strengthen partnerships with NGOs for their technical expertise and presence in the field. A possible NGO – donor exit strategy addressing sustainability issues should always be prepared at the outset of the intervention.

¹⁴ ENCU: emergency nutrition co-ordination unit

¹⁵ RUTF : ready to use therapeutic food

- Increase the emergency response and surveillance capacities. Having TFUs throughout the country and monitoring the TFU etc admission trends is a useful tool to detect any increase in malnutrition cases, and to be able to react in a timely manner.
- Revise the national protocol for the management of severe malnutrition taking into consideration the lessons learned.
- Develop strong monitoring and evaluation component to ensure high quality services.

The experience of the crisis showed the urgent need for a two pronged strategic approach. The urgency of the extremely large numbers of children being affected indicated the need for a strong broad-based but integrated therapeutic feeding programme that could immediately address suffering and save lives. On the other hand, the reoccurrence of the widespread crisis indicated the serious deficiencies in the overall national capacity to prevent malnutrition, promote good nutrition and manage planned, effective responses to on-going nutrition needs and future nutrition crises. UNICEF's position is that the time is right in terms of national and community readiness to further invest significantly in building national capacity to address nutrition in Ethiopia.