

The Nutrition Component of the Child Development Centre (CDC) Program in Maharashtra, India

Executive Summary

The following document is based on the review of secondary data from progress reports on the Child Development Centre (CDC) Program¹. Brief discussions were undertaken with the Health and Nutrition Officer of UNICEF Mumbai and the Monitoring Officer of the CDC Program. No visits were made to the sites. International updated technical information and guidelines have been used as benchmark to highlight key differences and as the basis for suggested recommendations. Reference documents are provided in a separate folder.

Among children under three years in the State of Maharashtra, the prevalence of underweight is 39.7%, stunting is 37.9% and wasting is 14.6% (source: NFHS-3). Overall the child nutritional status is slightly better than the national average; however the wasting indicator alone is over 10% which is the WHO threshold for recommended management of moderate and severe acute malnutrition through supplementary and therapeutic feeding programs.

The Government of Maharashtra has timely responded by creating a Nutrition Task Mission devoted to improve the overall child nutritional status through a comprehensive approach that includes preventive and curative aspects.

While the treatment of severely malnourished children has been appropriately mainstreamed in all Child Development Centres, this report highlights key adjustments that may need to be considered to align the currently used management protocol to international standards. Relevant areas comprise:

1. Admission criteria for children with severe acute malnutrition
2. Phases of malnutrition management and criteria to progress from one phase to the other
3. Diet to use in each phase, frequency of feeding and volume per feed
4. Length of staying and discharge criteria for children with severe acute malnutrition
5. Monthly reporting forms and performance indicators

The following two points have been included for consideration:

1. Given the global acute malnutrition percentage of over 10% the management of *moderate acute malnutrition* through supplementary feeding might need to be pondered to prevent further deterioration into severe acute malnutrition and reduce the risk of mortality.
2. Given the availability of an extensive network of health workers at community level (Anganwadi Workers) and their link with the Child Development Centres, the introduction of Ready to Use Therapeutic Food (RUTF) for outpatient treatment could be considered when households are not able to afford the recommended CDC diet.

The overall CDC program in Maharashtra State with its well established widespread system represents an example of a comprehensive approach to prevent, detect and treat acute malnutrition. Moreover, the commitment of the political leadership, the direct involvement of the government health system and the reliance on local resources – financial, human and physical – are all key determinants of sustainability and long-term impact on the nutritional status of children, especially those under three years.

The report suggests the CDC program to be thoroughly documented as a case-study with emphasis on its effectiveness, efficiency and impact.

¹ Guidelines on the Management of Acute Malnutrition in India were requested on several occasions but they seem to be unavailable. Therefore this report is based solely on the technical information made available.

1. Background information

This report looks only at the curative component within the CDC Program referred in the CDC report as “admission and treatment of severely malnourished children”.

1.1 Global overview at a glance:

1.1.1 Definition of a nutritional crisis and required actions

The WHO decision-chart to assess the magnitude and severity of a nutrition crisis and decide on the required action is based on the prevalence of wasting and a limited number of aggravating factors including: general food ration below 2100kcal/person/day, Crude Death Rate greater than 1/10,000/day and epidemic of measles or whooping cough.

Indicators	Acceptable	Risky		Serious	
GAM (W/H)	5-9.9% usual range and stable	5-9.9% (with aggravating factors)	10-14.9%	10-14.9% (with aggravating factors)	15% or more
CMR/10,000/day	<1/10,000/day	>1/10,000/day	<1/10,000/day	>1/10,000/day	<1/10,000/day
Food availability at household level	> 2100 Kcal/pers./day	< 2100 Kcal/pers./day	> 2100 Kcal/pers./day	< 2100 Kcal/pers./day	> 2100 Kcal/pers./day
Epidemic of measles or whooping cough	NO	YES	NO	YES	NO
Action required	Attention to malnourished children through regular services with emphasis on SAM	Supplementary feeding for MAM and therapeutic feeding for SAM		General ration Supplementary feeding for MAM and therapeutic feeding for SAM	

1.1.2 Technical updates in management of severe malnutrition

At a conservative estimate there are about 20 million children with Severe Acute Malnutrition (SAM; < 3 z scores weight/length or the presence of nutritional oedema) globally at any one time. With an estimated mortality of 10% (and in many situations it is higher than this) around 2 million children die from SAM annually, a higher number than from other more recognised causes of childhood mortality².

Community-based programs, including the Integrated Management of Childhood Illness initiative³ of the World Health Organization (WHO), have been developed to address the synergy between childhood malnutrition and infection, and these programs include nutritional rehabilitation. Such programs detect severely malnourished children by measuring Mid-Upper Arm Circumference (MUAC), treat such children with Ready-to-Use Therapeutic Foods (RUTF), and if necessary refer them to facility-based management. This is a cost-effective approach for secondary prevention and treatment of severe malnutrition using Community Therapeutic Care (CTC) with low mortality rates⁴.

Only a small proportion of severely malnourished children (15%) is very sick and requires inpatient treatment using F75 for Phase 1 and F100 for Transition and Phase 2. The high mortality risk of hospitalized children is thought to relate to several factors including electrolyte imbalance, hepatic

² Andrew Tomkins – cihd.ich.ucl.ac.uk or rstmh.org

³ WHO: who.int/child-adolescent-health/integr.htm

⁴ Dr. Steven Collins – validinternational.org

increased vulnerability to Iron Deficiency Anaemia and common child diseases like diarrhoea, fever and respiratory infections all of which are important determinants of acute malnutrition.

The highest prevalence of underweight and stunting coincides with the age 18-23 when most children are being weaned from breast milk. At this time 3 children out of 10 are severely stunted and 2 out of 10 are severely underweight. It is widely accepted that after the age of two-three years the effects of chronic malnutrition are irreversible.

Infants under six months are often excluded from nutrition surveys because they are considered less vulnerable to acute malnutrition taking into account that breast milk alone should cover all their nutritional requirements. While the inclusion of infants less than six months in the NFHS-3 target group population has been appropriate, the high prevalence of wasting needs further explanations. A cross-reference with exposure to communicable diseases, maternal nutritional status and feeding practices may help to get a better understanding.

Data from NFHS-3 show that malnutrition status is significantly correlated with the wealth and the education of the mother.

1.2.2 Links with the Integrated Child Development Service (ICDS), detection and referral of severely malnourished children to Child Development Centres:

The Integrated Child Development Services (ICDS) program is implemented through a network of community-level *Anganwadi* centres. The range of services targeted at young children and their mothers include growth monitoring, immunization, health check-ups, and supplementary feeding, as well as nutrition and health education to improve the childcare and feeding practices at family level.

Data from the NFHS-3 show a high coverage and sustainability of Anganwadi centres but a limited use of available services. With regards to the nutrition component, the following issues were highlighted at national level:

- Among children under three years, 24.4% did receive supplementary food (expected to be provided as daily basis or as take-home rations) and 19% were weighed reflecting a similar trend of health check-ups (17%). Only 10.7% of children went for monthly growth monitoring.
- Among pregnant women, 20.5% did receive supplementary food, 12.3% went for health check-ups and 10.9% received health and nutrition education.
- Among lactating women, 16.5% did receive supplementary food, 8.5% went for health check-ups and 8.3% received health and nutrition education.

Overall performance indicators for the State of Maharashtra are better than the national average for children under six years, pregnant and lactating women:

- Among children under six years, 42.4% did receive supplementary food, 37.4% were weighed reflecting a similar trend of health check-ups (36.2%). These data indicate overall access but not monthly frequency or age breakdown.
- Among pregnant women, 25.8% did receive supplementary food, 20.7% went for health check-ups and 13.4% received health and nutrition education.
- Among lactating women, 17.5% did receive supplementary food, 13% went for health check-ups and 10.4% received health and nutrition education.

The ICDS Program has recently undergone an extensive review that has resulted in increased emphasis on targeting children less than three years of age, behavioural change communication to improve family-based nutrition practices and control of micronutrient deficiencies through preventive supplementation of Vitamin A, Iron and Folic Acid, CMV Sprinkles, de-worming and zinc treatment during diarrhoea.

Strong attention is given to the monthly Growth Monitoring and Promotion of all children under six years with focus on the age 0-3 years and timely referral of children with illnesses.

Complementary to the ICDS, the CDC program includes early identification and initial admission of severely malnourished children (Grade III and Grade IV) in 408 sites distributed across Maharashtra.

The criteria used for severely malnourished is **underweight** (Weight-for-Age) based on the IAP reference table.

1.2.3 Management of Severe Malnutrition in Child Development Centres (CDC):

The time frame for the management of a severely malnourished child follows the 1999 WHO Guideline. Children are managed in two Phases:

- 1 Stabilization Phase up to seven days and;
- 2 Growth Phase up to six weeks.

After two-three weeks the child is transferred from inpatient to outpatient treatment at home using the same diet as recommended in the Child Development sites. The child is followed up to 26 weeks to prevent relapse.

The management of Severe Malnutrition in the CDC is based on four protocols:

The **Health Protocol** includes: treatment of infection through antibiotic during the first week, maintenance of electrolyte and vitamin balance (Macalvit+, K-sol & B-complex syrup), De-worming, Vitamin A administration, Iron & Folic Acid Supplementation (after the first week) and treatment of complications namely hypoglycaemia, hypothermia and dehydration. Children are weighed daily.

The **Nutrition Protocol** indicates that the intake of food should be considered in relation to the body's dietary needs. There is no difference in the diet between the Stabilization Phase and the Growth Phase. The Nutritional Protocol is based on locally available foods. The diet used in the sites for the treatment of the severely malnourished children is supposed to be followed by the caregivers at home once the child is transferred from inpatient to outpatient treatment.

The **Training Protocol** provides guidelines for the education sessions on Health, Nutrition, Hygiene and related relevant issues conducted in the Child Development centres. The same training is also given to village government functionaries and Anganwadi. The reference diet is the one used in the treatment of severely malnourished children admitted in the centres. According to the report, this hands-on training has contributed to an improved child diet at household level resulting in a reduction of the underweight prevalence.

The **Monitoring Protocol** indicates that children admitted in the Child Development Centres should have their weight monitored daily for 21 days by medical officers. Once children are sent back home from the CDC, they are expected to have their weight monitored every two weeks up to 26 weeks or up to the moment they reach the "normal" Grade.

2. Technical overview

A technical overview is provided for each key element of the detection and management of severely malnourished children highlighting main differences between the protocol used in the CDC program and the international standards.

International standards are based on the following literature:

1. WHO, Management of Severe Malnutrition (Manual), 1999
2. WHO in collaboration with Public Health Nutrition (London School of Hygiene and Tropical Medicine), Management of Severe Malnutrition (Training Modules), 2002
3. M. Golden & Y. Grellety, Guidelines for the management of the severely malnourished, September 2006
4. UNICEF, Emergency Field Handbook, July 2005

2.1 Admission criteria for severely malnourished children

CDC Program:

Malnutrition is classified according to the degree of **underweight** (Weight-for-Age) based on the Indian Academy of Paediatrics (IAP) reference table for boys & girls.

When comparing the IAP and the WHO-2005 classification (Reference Tables in **Annex A**), the IAP “normal” weight is significantly lower than the WHO “median” weight. The IAP classification indicates four Grades of malnutrition while the WHO three Standards of Deviations (-1 SD, -2 SD and -3 SD). The reference weight of children in Grade III (IAP classification) is significantly lower than the one of children in -3 SD (WHO classification). For example, the reference weight for a Grade III seven-month boy/girl in IAP classification is in the range 4.7-3.7 kg while the reference weight for a -3 SD seven-month boy/girl in WHO classification is 5.9 kg for the boy and 5.3 kg for the girl.

Children admitted in the CDC Program as Severely Malnourished are in Grade III and Grade IV according to the IAP classification. All children are admitted as inpatients in the Child Development centres. Children in Grade III and Grade IV with severe medical complications are referred to hospitals.

International Standards:

Acute Malnutrition is classified according to the degree of **wasting and the presence of oedema**. Wasting refers to the Weight-for-Height.

All children that fulfil any of the following criteria should be offered therapeutic feeding:

- Weight-for-Height/Length (W/H or W/L) less than 70 % or less than - 3 SD of the median reference population (NCHS/WHO table) **or**
- Bilateral pitting oedema **or**
- MUAC of less than 110mm/red colour (MUAC tape can be used for children with a length > 65 cm).

Additional criteria like appetite test and severity of medical complications have been included for decision-making in settings where inpatient and outpatient care is available. First the patient is identified by anthropometry and oedema. In the triage, the severely ill children are “fast-tracked” to treatment. All other children go through the appetite test while waiting to see the nurse who looks for the presence of medical complications. Children that need inpatient care are admitted in a Therapeutic Feeding Unit (TFU); children that can be treated as outpatients are referred to the Outpatient Treatment site nearest to their home. It is crucial to involve caregivers in the decision-making process.

Infants less than six months are always admitted for inpatient care. In addition to W/L and oedema, additional criteria include:

- The infant is too weak or feeble to suckle effectively (independently of his/her W/L)
- The infant is not gaining weight at home.

2.2 Malnutrition management and criteria to progress from one phase to the other.

CDC Program

Children are managed in two Phases:

1. Stabilization Phase up to seven days and;
2. Growth Phase up to six weeks.

The follow-up is provided up to 26 weeks or up to the moment the child reaches the “normal” weight.

From the CDC report, it appears that children in Growth Phase are transferred from inpatient to outpatient treatment after one or two weeks.

International Standards:

Inpatient children are managed in three Phases:

1. Phase 1 until the child is stabilized (2-7 days). Rapid weigh gain at this stage is dangerous, that is why the F75 formula is used to promote recovery of normal metabolic function and nutrition-electrolytic balance.

2. Transition Phase. Inpatients are introduced to F100 formula and their adjustment capacity to the new diet is closely monitored as this may lead to electrolyte disequilibrium. The expected weight gain should be around 6g/kg/day. The duration in this phase is 1-3 days.
3. Phase 2 until the child is discharged. Inpatients are still on a F100 diet and their expected weight gain should be around 8g/kg/day. In settings where outpatient care is available, inpatients that have progressed to Phase 2 can be treated at home using Ready-To-Use-Therapeutic-Food (RUTF). This reduces significantly the length of staying in the facility. Where outpatient care is available, children that have passed the appetite test and have no medical complications can be admitted directly in Phase 2 and treated at home using the RUTF.

Specific criteria have been devised for each phase to inform the decision-making for moving inpatients from one phase to the other. Where outpatient treatment is available, additional criteria have been developed to move the patients from inpatient to outpatient treatment and vice-versa. The transfer from inpatient to outpatient is not a “discharge” but a transfer to another part of the severe malnutrition management program.

2.3 Diet to use in each phase, feeding frequency and volume per feed.

CDC Program

All inpatients are given the same diet irrespective of the phase. The diet is formulated using available local foods (Nutrition Protocol in **Annex B**). Minerals and vitamins are provided to the child as supplements (Macalvit+, K-sol & B-complex syrup and Iron Folic Acid after seven days)

A feeding schedule is developed for children 6-35 months and 36-72 months with an accurate description of the diet to be given each time. At least three meals per day are based on a combination of fresh cow milk, sugar, oil, cereal powder (*amylage* powder) and addition of water. Remaining meals include solid foods like chapatti, seasonal fruit, *dal*, eggs and vegetable.

The nutritional protocol is devised to ensure that children 6-35 months get 1199 kcal energy and 21.87 gr. protein per day while children 36-72 months get 1580 kcal energy and 30.54 gr. protein.

There is no classification of the volume per feed according to the class of weight but it is recommended to not force-feed the child and increase feeding during the Growth Phase.

The Nutritional Protocol has been developed in line with the assumption that caregivers can learn how to prepare and apply the correct diet during their stay in the CD sites and continue to use it at home. Thus, the Nutritional Protocol is certainly valid to demonstrate how the ideal diet should be for a child from six months to six years.

Nevertheless, protein or energy deficiencies, per se, are no longer recognized as the usual causes of severe acute malnutrition. The deficiency of a number of growth nutrients – nitrogen, essential amino-acids, potassium, magnesium, sulphur, phosphorus, zinc, sodium and chloride – is associated to wasting. Treatment of severe wasting involves first the recovery of normal metabolic function and nutrition-electrolytic balance before a rapid weight gain can take place. Thus a diet that is high in protein, sodium and fat might be dangerous when the patient is stabilizing.

Key considerations on the current Nutritional Protocol include:

- The suggested diet during the Stabilization Phase (Phase 1) is high in protein and energy content. For stabilization, it is important to provide a formula (F75) with the energy and protein equivalent to 75 kcal of energy and 0.9 g protein per 100 ml (no less and no more).
- The suggested diet seems appropriate for Phase 2 (F100) where the *minimum* energy and protein content is equivalent to 100 kcal of energy and 2.9 proteins per 100 ml.
- For the *amylage* recipe, the content of cows' milk, sugar, oil and cereal powder should be proportioned to the overall amount of the formula (e.g. 1000 ml) whereby it should be clear that addition of water is only up to 1000 ml. It is easier to include the mineral mix in the formula to correct electrolyte imbalance rather than provide nutrients as separate supplements.

- The volume per feed per child should be calculated according to the class of weight especially in the initial phase of the treatment.

International Standards:

During initial management (Phase 1), F75 is the "starter" formula to use as soon as possible and continue for 2-7 days until the child is stabilized. Severely malnourished children cannot tolerate usual amounts of protein and sodium at this stage, or high amounts of fat. They may die if given too much protein or sodium. They also need glucose, so they must be given a diet that is low in protein and sodium and high in carbohydrate. F75 is specially made to meet the child's needs without overwhelming the body's systems in the initial stage of treatment. Use of F75 prevents deaths.

F75 contains 75 kcal and 0.9 g protein per 100 ml

When the child is stabilized on F75, F100 is used as a "catch-up" formula to rebuild wasted tissues during Transition and Phase 2.

F100 contains more calories and protein: 100 kcal and 2.9g protein per 100 ml.

F75 and F100 are commercially available as pre-packaged formula to be mixed with water or they can be prepared using locally available ingredients. Where Combined Mineral and Vitamin Mix are not accessible, a mineral mix prepared by the pharmacy need to be added to the formula and multivitamin drops need to be provided directly to the child as supplements. Iron can only be added to F100 formula.

Several recipes have been developed for F75 and F100 based on the availability of ingredients, particularly the type of milk, and the availability of cooking facilities (**Annex C**). The principle behind these recipes is to provide the energy and protein needed for stabilization and catch-up. Recipes with no cereal flour have a high osmolarity (415 mOsmol/l) and may not be tolerated well by some children with diarrhoea.

Feeding Tables have been developed by WHO to provide instructions on the volume of F75 or F100 based on the weight-class and the frequency of feeds (**Annex D**). A specific F75 reference card has been developed for children with severe oedema (+++). WHO recommends leaving daily instructions to the staff in charge of preparing and distributing the feeds with the required amount for each child based on the weight-class.

F100 and Ready-To-Use-Therapeutic Food have the same nutritional content. Where outpatient treatment is available, RUTF can be provided as a take-home ration based on the child weight-class. RUTF is usually oil-based with little available water and, therefore, resistant to bacterial growth and can be safely used even where hygiene conditions are not optimal. It is important that caregivers are provided with comprehensive information on the use of RUTF.

2.4 Length of stay and discharge criteria for children with severe acute malnutrition.

CDC Program:

The length of stay in the Child Development sites is up to two or three weeks. After that, the diet is supposed to be continued at home up to 26 weeks or up to the time the child reaches the "normal" weight. Weighing and health check-ups are done every two weeks in the following 26 weeks.

The discharge criteria from the CDC program are:

- Child has reached the "normal" weight or
- Child has been followed for 26 weeks.

International Standards:

The discharge criteria for severely malnourished children account for both the inpatient and outpatient treatment programs. Any transfer from inpatient to outpatient treatment and vice-versa is always recorded as "transfer out" and never as "discharge" or "new admission".

Discharge criteria for children are:

- W/H or W/L \geq 85% (WHO/NCHS table) on at least two weighing sessions **and**
- No oedema for 14 days

Where children are admitted on MUAC criteria to outpatient sites without the staff skills to measure height, a reference table with targeted weight gains is used to inform the decision. The other criterion is that there should be no oedema for 14 days.

Discharged patients are expected to be enrolled in a nutritional support program for another four-six months. For the first two months, they should attend every two weeks and then once per month if progress is satisfactory.

2.5 Monthly reporting forms and performance indicators.

CDC Program:

The following indicators are provided on a monthly basis:

- Number of children Grade IV admitted
- Number of children Grade III admitted
- Prevalence of children upgraded from Grade IV to Grade III
- Prevalence of children upgraded from Grade III to Grade II
- Number of children within each range of weight-gain in grams per day
- Prevalence of children within each range of weight-gain in grams per day

From the monthly-growth monitoring the following data are provided:

- Number and prevalence of children with a “normal” weight
- Number and prevalence of children in Grade I
- Number and prevalence of children in Grade II
- Number and prevalence of children in Grade III and Grade IV

There is an indication on the progress-trends but no suggestion on the growth-monitoring coverage.

Children with serious medical complications are referred to hospitals for inpatient treatment but it seems that they are not tracked in the CDC monitoring system.

International Standards:

The following indicators are included in the **monthly report** form:

Admissions:

- Number of total patients at the beginning of the month (A)
- W/H $<$ 70% or MUAC $<$ 110 mm (B1).
- Oedema (B2).
- Relapse (B3).
- Readmission after defaulting (B4)
- Transfer in from another therapeutic unit (B5)

Discharges:

- Cured (D1).
- Death (D2).
- Defaulter (D3)
- Unknown (D4)
- Non-responder (D5)
- Medical transfer (D6)

Transfer out:

- Transfer out to outpatient (F1)
- Transfer out to inpatient (F2)

Totals:

- Total new admissions ($C = B1 + B2 + B3 + B4 + B5$)
- Total discharges ($G = D1 + D2 + D3 + D4 + D5 + D6$)
- Total end of the month ($H = A + C - G$)

Note: patients that are “transfer out” do not count as “discharges” or as “new admissions”.

Performance indicators:

Performance indicators should be available from routine monitoring systems.

- Recovery rate.
- Death rate.
- Defaulter rate.
- Weight gain.
- Length of stay.
- Coverage.

Reference values have been developed by **Sphere project** against which to interpret the functioning of individual programs. They give an indication of what might be considered “acceptable” or “alarming” performance under average conditions where other programs are also functioning.

Reference values for SAM management ©Sphere project

Indicators	Acceptable	Alarming
Recovery rate	> 75%	< 50%
Death rate	< 10% (<5% preferable)	> 15%
Defaulter rate	< 15%	> 25%
Weight gain	≥ 8 g/kg/day	< 8 g/kg/day
Length of stay	< 4 weeks	> 6 weeks
Coverage	> 50-70%	< 40%

Acceptable benchmarks for outpatient programs would be: rate of weight gain more than 4g/kg/day and length of stay less than 60 days.

2.6 A Note on the diagnosis of dehydration in severely malnourished children and administration of ReSoMal

Administration of ReSoMal is mentioned in the CDC Health Protocol for the treatment of dehydration. This is in line with 1999 WHO Guidelines.

Recent studies and guidelines are putting increased emphasis on orienting the health staff to be very careful in the administration of ReSoMal before diagnosis is confirmed and to never use it as preventive treatment. The standard protocol for the well-nourished dehydrated child should not be used for the severely malnourished because of real danger of fluid overload and cardiac failure. Malnourished children with persistent or chronic diarrhoea are *not* dehydrated and they have adapted over the weeks to their altered hydration state.

Diagnosis of dehydration in the marasmic patient should not be based on the classical signs of dehydration because they are unreliable. The main diagnosis should come from the history rather than from the examination. Thus, new guidelines recommend starting with a provisional diagnosis and closely observing the response to ReSoMal treatment before confirming the diagnosis.

3. Key differences between CDC Program and International standards:

1. **Admission criteria.** CDC program uses Grade III and Grade IV for admission while international standards recommend severe wasting and presence of oedema.

2. **Management phases.** CDC program uses two phases: 1) Stabilization and 2) Growth Phase. International standards recommend three phases: 1) Phase 1; 2) Transition and 3) Phase 2. The Transition is crucial to closely monitor the child before progressing him/her to Phase 2. Specific criteria have been developed to inform health staff when to progress the child to the next phase or when to move the child back to the previous phase.
3. **Diet requirements.** CDC program uses a Nutritional Protocol based on locally available foods. The diet is the same throughout the phases but while appropriate for the Growth Phase it might be too high in the energy and protein content when the child is stabilizing. Minerals and vitamins are provided directly to the child as supplements. International standards recommend F75 during Phase 1 and F100 during Transition and Phase 2. F75 is specially made to promote recovery of normal metabolic function and nutrition-electrolytic balance before a rapid weight gain can take place. It is recommended adding a Combined Mineral and Vitamin (CMV) mix directly to the formula when using recipes made with locally available ingredients.
4. **Discharge criteria.** CDC program uses the following criteria: 1) Child has reached the “normal” weight or 2) Child has been followed for 26 weeks. International standards define discharge criteria as: 1) Weigh-for-height/ length > 85% on at least two weighing sessions and 2) No presence of oedema for 14 days. A reference table has been developed with required weight-gains for facilities admitting children through MUAC without Weight-for-Height/Length.
5. **Length of stay.** CDC program keeps the children in the sites for two-three weeks. Afterwards, when children are sent back home, they are supposed to continue with the same diet and come back every two weeks for weighing and health check-up up to 26 weeks or up to the moment they reach the “normal” weight. Because the CDC program started only in the beginning of the year, there are no data available on the number of children that have been discharged. International guidelines define less than four weeks as an acceptable length of stay in the facility. However, where outpatient care programs are available, it is recommended having children in Phase 2 continue the treatment at home using RUTF. The rate of weight gain in outpatient treatment is frequently less than 8g/kg/day and the length of stay more than six weeks. An acceptable standard would be weight gain more than 4g/kg/day and length of stay less than 8 weeks.
6. **Performance indicators.** CDC programs’ routine monitoring system collects the following indicators: number of admissions of children in Grade III and Grade IV, prevalence of upgrading from Grade III to Grade II and Grade IV to Grade III and weight-gain. The upgrading prevalence is not indicative of the recovery rate which should match with the rate of children “discharged” because “cured”. However, the CDC standard for “discharge” is very high: “normal” weight or completing 26 weeks. From available data it is also difficult to understand if the number of admissions refers to “new admissions” or if it also includes “number of patients at the beginning of the month”. Data from growth-monitoring show underweight-trends per District but a coverage indicator is needed to state the underweight prevalence. International guidelines recommend the monthly collections of the following performance indicators from the routine monitoring system: recovery rate, mortality rate, defaulter rate, weight-gain, length of stay and coverage (although coverage requires other mechanisms to be put in place). In addition, a surveillance system is being piloted to monitor wasting-trends using sentinel sites where a sample of children are randomly selected in the beginning of the year and have their weight, height and mid-upper-arm-circumference measured at monthly intervals with additional food security data collected from their house.

4. Conclusions

1. The use of different admission criteria in the CDC program from those applied internationally would suggest the entire management system is based on different standards. Without questioning the importance of monthly growth monitoring (Weight-for-Age) to prevent malnutrition, anthropometric measurements for wasting (Weight-for-Height/Length and/or MUAC) and recognition of bilateral pitting oedema could be introduced to confirm admission. The MUAC tape alone could be used for children with a length > 65 cm where the measurement of weight-for-height/length is too difficult.

2. Comprehensive guidelines for the management of severe malnutrition should be developed/disseminated covering each aspect of the treatment from admission to discharge, including treatment of most common medical complications. Since children are currently admitted in the so called "Stabilization Phase" and with medical complications like hypothermia, dehydration and hypoglycaemia, a special diet is required to meet their needs without overwhelming the system in the initial part of the treatment. Severely malnourished children that have to be admitted as inpatients because of low appetite and medical complications are at increased risk of mortality during the stabilization phase. On the contrary, if the admitted children in the CDC program present characteristics that do not require an initial stabilization but would allow them to go directly into the "Growth Phase", then the overall length of stay as inpatients in the CDC should be reduced significantly. The current two-three weeks stay may put a burden on the costs of the program and on the caregivers themselves. It should be noted that this would not interfere with the systematic antibiotic treatment that is compulsory for all malnourished children (including those with moderate or good appetites). According to international experience on children admitted directly in Phase 2 (outpatient care treatment), children are usually given antibiotics systematically in a similar fashion to those that initially require Phase 1 treatment. Fortified foods such as RUTF may need to be considered to allow a faster recovery during the home treatment as they contain the necessary mix of minerals and vitamins that malnourished children need in their diet in addition to protein and energy.
3. The monitoring system should include performance indicators that are recognized internationally so that the CDC program can be assessed on objective grounds.
4. Based on the NFHS-3, the global acute malnutrition of over 14.6% would require the management of moderate acute malnutrition through supplementary feeding to be considered to reduce the significantly high prevalence of severe acute malnutrition (5.6%) and prevent mortality. In addition, the 13.1% of severe acute malnutrition in infants less than six months may need further understanding and an appropriate response.

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