

The Treatfood project will lead to a number of novel research findings, some of which will be directly relevant to policy.

The main findings about the type of food and ingredients to be given to children have just been accepted by the high-ranking open-access journal Plos Medicine, and will be published within 6 weeks. We plan to make policy brief and press release to accompany this publication.

Another major finding is about the treatment response in short children. These findings will be published as two papers. The first was out in early 2016, based on conventional anthropometry only. This paper support the inclusion of short children in treatment programs. To accompany that paper, published in American Journal of Clinical Nutrition, a policy brief was written and published at the CMAM Forum. This information has also been used widely by ALIMA to inform governments and NGOs working with moderate acute malnutrition. Hence, we upload the policy brief in the form it has actually been used, and has already had impact on policies.

Should we have height cut offs to define treatment for children with acute malnutrition?

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Should length be used to define a child's eligibility for treatment of acute malnutrition?

In many malnutrition treatment programs in West and Central Africa, it is common practice to use a length/height (henceforth length) cutoff when deciding which children are admitted for treatment by Mid-Upper Arm Circumference (MUAC) only. A [recent study](#) in Burkina Faso documented no difference in growth rate between children ≥ 6 months who were < 67 cm compared with ≥ 67 cm in length when included in a supplementary feeding program for moderate acute malnutrition (MAM) based on an MUAC of 115–124 mm and a WHZ ≥ -2 [1]. A similar finding was reported earlier in Sudan by Dale *et al* in children with SAM [2, figure 5].

Where is a minimum length used to define when children are admitted by MUAC only?

The generic protocol for the West and Central African Region does not contain a length restriction for MUAC. The following countries, however, do include a length restriction of ≥ 67 cm in their national protocols, specifically in the Annex providing instructions for “Taking MUAC/Prendre le PB”: Cameroon, Central African Republic, Chad, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Senegal, and Togo. Countries in other regions also include a length restriction for MUAC. For example, admission criteria in the national SAM guidelines of Ethiopia (2007) include “MUAC < 110 mm with a length > 65 cm”. The use of a length threshold was also reported in a treatment program in South Sudan [3].

Was this length restriction ever a formal recommendation from the WHO?

No, there has never been any official WHO endorsement. The practice of limiting treatment to children ≥ 67 cm was based on expert opinion and humanitarian practice. At a UN technical consultation on MAM in 2010, a consensus statement indicated that more research was needed to identify the appropriate admission and discharge criteria based on MUAC for children < 67 cm and ≥ 6 months of age [4]. This question was addressed by the research in Sudan and Burkina Faso.

WHO's current recommendation for identifying children with MAM is based on weight-for-height or MUAC cut-offs for infants 6 months of age and above (up to 5 years of age), without any length cut-off for exclusion of children if MUAC is used. For SAM, presence of bi-lateral edema is an additional criterion for admission.

Where does the 67 cm length cut-off come from?

Short children with a low MUAC and WHZ > -2 , are suspected to be either young (< 6 months) or stunted, rather than acutely malnourished, and therefore would not have the rapid “catch-up” growth typical of more wasted children.

The continued use of a length restriction for MUAC is likely a holdover from old versions of emergency nutrition guidelines that used length as a proxy for age because it can sometimes be difficult to ascertain age in a fast moving emergency (with 65 cm and 67 cm corresponding, respectively, to the average of

boys' and girls' median length of a 6-month-old according to the 1977 National Center for Health Statistics reference and the WHO 2006 growth standard).

The WHO used length/height of 60 cm as a proxy for age of 6 months in publications from 1995 and 2000 [5, 6] while length/height of 65 cm was used in guidelines from non-governmental humanitarian organizations like Médecins Sans Frontières (MSF) in 1995 and Valid International in 2006 [7, 8].

The best way to ascertain the age of a child is to ask the mother or caretaker, who can most often recall the month of birth for an infant born in the previous year. If age is still in doubt, or the circumstances are particularly extreme, the main criterion for deciding whether he or she could benefit from therapeutic or supplemental food is the child's ability to swallow, which is assessed during the appetite test.

Children <67 cm long and ≥ 6 months of age are also likely to be stunted. There was a concern that children in this category may not show "catch-up growth," or may deposit fat rather than lean mass, thus supplemental feeding could place them at risk of non-communicable diseases like obesity [4]. The study from Burkina Faso shows that children in this category do show appropriately accelerated rates of weight and MUAC gain when provided with highly nutritious supplemental foods and a forthcoming paper will address the question of lean mass deposition.

What is the consequence of restricting MUAC only admission to children ≥ 67 cm?

The use of a 67-cm length cutoff for measuring MUAC excludes a significant percentage of 6-9 month-old children from inclusion in nutrition programs, even those with low MUAC. (The percentage will vary depending on the level of stunting in the population. In the Burkina Faso study, it was determined that the children >6 m and <67 cm with WHZ >-2 but a MUAC <125 mm constituted 14% of all admissions.) With increasing age, an increasing proportion of excluded children will be stunted, as was found in Bangladesh when using 65 cm as a proxy for 6 months of age [9]. Using such a restriction for MUAC excludes some stunted children with a low MUAC who are at considerable risk of death if left untreated. Both wasting and stunting increase a child's risk of death, especially when both are present in the same child [10], and MUAC appears to be a good tool for identifying them.

Does this removal of a length restriction apply to SAM as well as MAM?

Yes. The similar growth rates found for children below and above 67 cm with MAM included for treatment by MUAC in the Burkina Faso study is in line with a similar finding in children with SAM in Sudan [2].

Should the length of a child be considered when admitting children by MUAC only?

No. MUAC criteria (i.e. <115 mm for SAM and 115-124 mm for MAM) applies to any child 6 months to 5 years of age, regardless of how long or tall they are, and irrespectively of their WHZ. Age should be the only factor for deciding if a child's MUAC measurement is taken for consideration in MAM and SAM treatment programs, whether during screening in the community or during the admissions process. Appropriate MUAC cut-offs for infants <6 months of age are still in the process of being identified.

Current practitioners should no longer consider the length, but only the age of a child when admitting for treatment of malnutrition based on MUAC only, and future protocols should be revised accordingly. Ending the practice can save more lives while simplifying the response to malnutrition by eliminating an unnecessary step in the screening and admission process.

Please let us know if you are aware of other countries or programs that have included a length restriction for eligibility solely by MUAC. (Please email: cmamforum@gmail.com in this regard)

REFERENCES

- [1] Fabiansen C, Phelan KP, Cichon B, Ritz C, Briend A, Michaelsen KF, Friis H, Shepherd S. Short children with a low midupper arm circumference respond to food supplementation: an observational study from Burkina Faso. *Am J Clin Nutr* 2016; 103(2):415-21.
- [2] Dale NM, Myatt M, Prudhon C, Briend A. Using mid-upper arm circumference to end treatment of severe acute malnutrition leads to higher weight gains in the most malnourished children. *PLoS One*. 2013;8(2):e55404.
- [3] Grellety E, Krause LK, Shams Eldin M, Porten K, Isanaka S. Comparison of weight-for-height and mid-upper arm circumference (MUAC) in a therapeutic feeding programme in South Sudan: is MUAC alone a sufficient criterion for admission of children at high risk of mortality? *Public Health Nutr*. 2015 Oct;18(14):2575-81.
- [4] WHO. UNICEF, WFP and UNHCR consultation on the programmatic aspects of the management of moderate acute malnutrition in children under five years of age. Geneva (Switzerland): WHO; 2010.
- [5] WHO. The management of nutrition in major emergencies. Geneva (Switzerland): WHO; 2000.
- [6] WHO Regional Office for the Eastern Mediterranean. Field guide on rapid nutritional assessment in emergencies. Alexandria (Egypt): WHO; 1995.
- [7] Médecins Sans Frontières. Nutrition guidelines. Paris: Doctors Without Borders; 1995.
- [8] Valid International. Community-based therapeutic care (CTC): a field manual. Oxford (United Kingdom): Valid International; 2006.
- [9] Ali E, Zachariah R, Hinderaker S G. et al. Does the 65 cm height cut-off as age proxy exclude children eligible for nutritional assessment in Bangladesh? *Public Health Action*. 2012;2:103–106.
- [10] McDonald CM, Olofin I, Flaxman S, Fawzi WW, Spiegelman D, Caulfield LE, Black RE, Ezzati M, Danaei G; Nutrition Impact Model Study. The effect of multiple anthropometric deficits on child mortality: meta-analysis of individual data in 10 prospective studies from developing countries. *Am J Clin Nutr*. 2013 Apr;97(4):896-901.