



How do children with severe underweight and wasting respond to treatment?

This is a summary of the following paper: Odei Obeng-Amoako G, Stobaugh H, Wrottesley S et al (2023) *How do children with severe underweight and wasting respond to treatment? A pooled secondary data analysis to inform future intervention studies. Maternal & Child Nutrition*, 19, e13434 <https://doi.org/10.1111/mcn.13434>

Evidence shows that the most effective combination of indicators for identifying the highest risk of death in malnourished children under the age of five is a weight-for-age z-score (WAZ) < -3 and a mid-upper arm circumference (MUAC) < 11.5 cm (Khara et al, 2023). While including WAZ < -3 as an additional independent criterion for admission may improve the targeting of therapeutic treatment to the most vulnerable, a low WAZ is not widely used for this purpose, and there are various questions about its programmatic implications. This article presents findings from a pooled secondary analysis of existing research and programmatic data to better understand the growth trajectories and response to treatment of wasted children with WAZ < -3 within wasting treatment programmes, both supplementary and therapeutic.

According to the data used by the article, nine countries in Africa and Asia, a low WAZ was common among moderately wasted children (40%

of admissions) and severely wasted children (60% of admissions). These proportions varied by context, with the highest prevalence of WAZ < -3 in India (90%) and the lowest in Kenya (32%). A low WAZ was more common in male than in female children, as well as in children aged between two and five compared to children below two years of age.

Wasted children with WAZ < -3 had lower recovery rates, a higher risk of death and a higher risk of transfer to inpatient care. While they gained weight in similar patterns to other wasted children, those with a low WAZ had markedly lower anthropometric measurements (height-for-age z-score [HAZ], weight-for-height z-score [WHZ] and MUAC) at admission and end of care. This suggests that these children have further to catch up and may require longer, or more tailored, treatment. This is particularly relevant for moderately wasted children with WAZ < -3, who are not currently eligible for therapeutic feeding in many contexts.

Overall, children admitted to community-based management of acute malnutrition (CMAM) programmes demonstrated modest HAZ gains during treatment. Children with moderate wasting had the lowest HAZ gains. Such children are likely to receive lower-intensity treatment than children who are severely wasted, and this may be insufficient to support catch-up growth. Particularly for children with severely low WAZ, a minimum intensity or quality of treatment may be required to promote linear growth, or at least to maintain HAZ.

Further, this analysis shows that children with oedema and severely low WAZ are at a comparatively greater risk of death than other groups, and are more likely to be stunted at admission. Treatment programmes do not currently consider these vulnerabilities, and more work is needed to understand and mitigate these risks.

As a next step, an intervention trial is needed to further explore these hypotheses. This trial should include non-wasted children with WAZ < -3, who are not currently represented in data from CMAM programmes.

References

Khara T, Myatt M, Sadler K et al (2023) Anthropometric criteria for best-identifying children at high risk of mortality: A pooled analysis of twelve cohorts. *Public Health Nutrition*, 26, 4. <https://pubmed.ncbi.nlm.nih.gov/36734049/>

Postscript: Response from the authors

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This analysis, conducted by a subgroup of the Wasting and Stunting Technical Interest Group (WaSt TIG), supports evidence that children with wasting and WAZ < -3 are even more vulnerable to mortality and do not achieve traditional definitions of nutritional recovery as often as other wasted children. Wasted children with WAZ < -3 do gain weight in a similar pattern to other children with wasting, but they have further to catch up and therefore a longer or higher-intensity treatment may be needed. This is especially true for children with moderate wasting and WAZ < -3, who are only eligible for low-intensity treatment (if anything) in many settings. Those with severe wasting and low WAZ would already be eligible for ready-to-use therapeutic food (RUTF), but a higher intensity of RUTF is unlikely to be feasible. As a result, longer-treatment might be more suitable for them. Children with severely low WAZ as well as oedema are likely to require the greatest support, as they have the highest mortality risk.

The optimal length of treatment is something we would like to explore in a future analysis, both for wasted children with WAZ < -3 and for wasted children in general. Currently, many CMAM programmes have a 'non-

response' definition of "no recovery within 16 weeks of starting treatment". Some programmes have even shorter treatment timelines than this. There is wide heterogeneity in terms of treatment times and recovery definitions within the database we used for this analysis, since it is a compilation of data from 13 CMAM programmes. Going forward, we therefore plan to explore the appropriateness of existing definitions of non-response, including the characteristics of so-called 'non-responders' and at which timepoint weight gain tends to plateau. Please see the Wasting and Stunting area of the ENN website, where you can find the WaSt TIG plans for this work.¹

The definition of nutritional recovery also warrants exploration, since there was also much variation regarding this in our dataset. Our analysis classified a large proportion of children as 'early discharge' and 'non-response', which led to a very low recovery rate (approximately 25%). Our definition of recovery for this analysis was 'both MUAC > 12.5 and WHZ > -2', which was not the case for all the programmes included in the data. Some programmes discharged children once MUAC had recovered, but not WHZ. We do not know what would have happened to those children had they continued treatment; it is likely that some would have re-

covered according to our definition. In order to explore whether this affected our conclusions on children with severely low WAZ, we conducted an analysis using the different programmes' individual definitions of recovery (see Appendix Table 10 of the paper). This analysis showed that our conclusions remained the same, but the effect size of poor outcomes for those with WAZ < -3 diminished. This is an important consideration for anyone who is using our effect size to determine the sample size for a future study.

We very much hope that researchers will use our analysis to inform further studies. While continued secondary data analyses are needed, we do ultimately need intervention trials (such as the one outlined in the protocol designed by the WaSt TIG)² as these will include non-wasted children with WAZ < -3 (who are currently not represented in the available data from CMAM programmes), as well as a controlled range of treatment lengths and intensities. Primary research studies will ultimately confirm the type of treatment needed for vulnerable children with WAZ < -3 to survive and thrive.

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¹ <https://www.enonline.net/ourwork/reviews/wastingstunting>

² <https://www.enonline.net/resource/newevidenceintopractice>