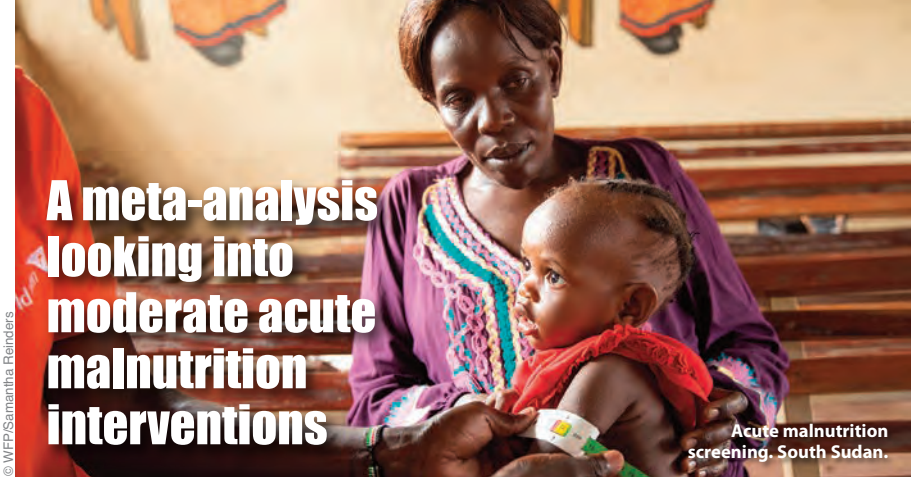

A meta-analysis looking into moderate acute malnutrition interventions

This is a summary of the following paper: *Cichon B, Das J, Salam R et al. (2023) Effectiveness of dietary management for moderate wasting among children >6 months of age – A systematic review and meta-analysis exploring different types, quantities, and durations. Nutrients, 15, 5.*
https://www.mdpi.com/2072-6643/15/5/1076

This systematic review and meta-analysis investigated the effect of multiple food intervention categories alongside standard clinical care on moderate acute malnutrition. A broad spectrum of interventions was included at different doses, roughly broken down into: non-specially formulated foods (e.g., home foods); lipid-based nutrient supplements (LNS); fortified blended foods; and non-fortified blended foods. A flowchart describing the detailed categories of interventions, as well as the exact search terminology employed across the nine selected databases, can be found in the original paper.

The study population was children aged >6 months with moderate wasting.[1] The outcomes of interest were: i) anthropometric recovery / outcomes (weight-for-length, weight-for-age, mid-upper arm circumference, weight and height gain); ii) sustained recovery; iii) deterioration to severe wasting; iv) time to recovery; and v) non-response relapse. No language or date restrictions were applied to the search up until 23 August 2021.

The initial search yielded 32,180 studies, which was reduced to 22 papers (17 studies) after review. Studies were randomised controlled trials conducted in Africa (n=16) and Asia (n=1) between 2009 and 2021.

Due to the size of the analysis, a full breakdown of each outcome category and intervention vs intervention sub questions is beyond the scope of this summary. Overall, LNS offered small benefits to recovery and anthropometric indices compared to fortified blended foods. There was no significant difference in LNS vs enhanced fortified blended foods for recovery, anthropometry, and morbidity. LNS may be superior to enhanced fortified blended foods for weight gain (weight-for-height and mid-upper arm circumference), but the effect size is small. There was no difference in recovery when ready-to-use therapeutic and ready-to-use supplementary food were compared.

The data in this study were heterogenous, making it difficult to compare so many different intervention categories, products, regimens, outcomes, and timelines. Essentially, this study only provides evidence in African settings, as 94% of the included studies came from the continent – which in itself is diverse – so we cannot extrapolate this to other settings without further evidence. No studies compared specially formulated foods to home foods, which is an evidence gap.

The use of multiple comparisons, and subsequent research questions asked, may increase the risk of findings being due to chance. Given that effect sizes were small, the results cautious, and the findings being broadly in line with other evidence, the authors note that:

"LNS may be preferable compared to the 'outdated' corn soy blend and less enhanced fortified blended cereals. However, given the small difference in treatment outcomes… any programmatic decision on which of these to choose may therefore want to consider acceptability, availability, as well as cost and cost-effectiveness."

[1] Defined as weight-for-height z-score of ≥-3 and <-2 and/or a mid-upper arm circumference of ≥11.5cm and <12.5cm or a weight-for-height between >70 and <80% of the median and no oedema, treated either as inpatients or outpatients.

Cambodia: Vitamin A and iron status remain unaffected by ready-to-use therapeutic food

This is a summary of the following paper: *Sigh S, Roos N, Chhoun C et al. (2023) Ready-to-use therapeutic foods fail to improve vitamin A and iron status meaningfully during treatment for severe acute malnutrition in 6–59-month-old Cambodian children. Nutrients, 15, 4, 905.*
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9961841/

This randomised controlled trial collected baseline and follow-up data on micronutrient status after an eight-week intervention on uncomplicated severely wasted children aged 6–59 months. Severe wasting was defined as a weight-for-height z-score ≤-2.8 or mid-upper-arm circumference ≤115mm and/or the presence of nutritional oedema.

The intervention was a novel ready-to-use therapeutic food (RUTF) (NumTrey: a wafer filled with a fish-based paste) compared to a regular milk-based RUTF (BP-100™) as a control. The trial took place between September 2015 and January 2017 in an urban setting (Phnom Penh, Cambodia). Food rations in each arm were based on national standards by child weight (160–180 kcal/kg). Analysis of results showed minimal impact of both locally produced and standard RUTF on micronutrient status, which is a similar finding to other relevant studies. There was no significant difference for haemoglobin, iron status, inflammation, vitamin A status, or anaemia between baseline and discharge ($p>0.05$), and no significant difference for any of these measures between control and intervention groups ($p>0.05$). Given these results, the authors suggest the need for further research on how to enhance the effectiveness of SAM treatment on micronutrient status.

However, the results of this study should be interpreted with caution due to several caveats.

Minimal impact could be attributed to the short follow-up period, which may not have been long enough to reflect changes in micronutrient status – which can take 1–6 months in some cases. A standard sample size calculation indicated that the study should include 120 children to detect a 10% difference in effect. A high dropout rate (≈40%) resulted in 37 participants per arm included in the final analysis – so this trial was underpowered, reducing the chance of detecting a true effect. Although micronutrient status was a secondary outcome, meaning this calculation is not relevant for this aspect of the study, the dropout rate and subsequent small sample size remain significant considerations when interpreting these results.

At baseline, the prevalence of anaemia, haemoglobinopathies, iron deficiency, low body iron, and vitamin A deficiency was higher among those randomised to the control group, which may inflate the effects of the intervention arm. More males (60%) featured in this study than females (40%) at admission, but this was more pronounced in the control (64:36%) compared to intervention (55:45%) arm. This may be the cause of greater anaemia prevalence in the control arm, as male children are more likely to be anaemic.[1,2] This highlights the importance of matching control and intervention groups in small studies[3] to minimise the challenges of interpreting results.

[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7993607/
[2] https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0113756&type=printable
[3] https://jnnp.bmj.com/content/75/2/181