

Research priorities on the relationship between wasting and stunting

Summary of research*

Location: Global.

What we know: There is global momentum to bring down levels of undernutrition. Wasting and stunting frequently co-exist, but are often considered separately.

What this article adds: A research prioritisation was conducted to investigate the relationships between wasting and stunting, using the CHNRI (Child Health and Nutrition Research Initiative) methodology. A group of 18 experts in nutrition, growth and child health prioritised 30 research questions against three criteria (answerability, usefulness and impact). There was strong support for prioritisation of research related to interventions and programming that can impact on both wasting and stunting. Greater commitment from funders, academics and implementing agencies is needed to carry out clinical trials or large-scale programmatic evaluations, with robust research design.

Background

Wasting affects 52 million (19 million severe wasting) and stunting affects 165 million children under five years old each year. Wasting and stunting frequently co-exist in the same population (sometimes in the same child), but they are usually separated in terms of policy, guidance, programming and financing. Both forms of undernutrition share causal factors such as infectious diseases, poor diet and suboptimal infant feeding and caring practices, yet the physiological relationship between them and how interventions for one affect the other are poorly understood. Consequently, there is a need for a closer look at how children experience both wasting and stunting over time, and how to sharpen programming focus (particularly on prevention) to achieve impacts for both. This research aimed to establish research priorities to fill critical gaps in this area and to guide future research investments.

Study methods

The authors used the Child Health and Nutrition Research Initiative (CHNRI) methodology for setting research priorities. The method enables individual experts to systematically develop possible research questions by scoring them against pre-defined criteria. It was agreed to use an existing Technical Interest Group (TIG) facilitated by ENN, comprising 25 individuals from a range of organisations (including academia and non-governmental organisations (NGOs)) with expertise in research and programming for wasting and stunting.

The resulting list of possible questions was then refined using a recommended theoretical framework with a set of criteria with which to judge the questions. The criteria were reduced to three in order to encourage as many experts as possible to complete the survey. These were:

Answerability: Was the research question well framed, with well defined end points, and likely to gain ethical approval?

Usefulness: Would the intervention that would be developed/improved through this research be deliverable, effective and efficacious?

Impact: Would the research endpoints for this question have high impact (i.e. the capacity to remove 5% or more of the disease burden)?

Thirty research questions were tabled against each of the three criteria, which formed an online survey with a total of 90 queries. All TIG members were sent a link to the online survey and invited to take part. Each of the 30 research questions received three scores, one for each criterion ranging between 0-100%. The overall research priority score (RPS) was calculated as a mean of all three priority scores so that the priority of research questions was ranked accordingly.

Findings

Of the 25 TIG members, 18 (72%) took part in the survey, with 16 completing it in full. Most respondents were academics (n=10); some were engaged in operations and programming (n=3); one worked primarily in policy; while others declared involvement in a mix of these activities (n=4).

The highest ranking questions were:

1. *“Can interventions outside of the 1,000 days, e.g. pre-school, school-age and adolescence, lead to catch-up in height and in other developmental markers?”* This question scored very highly against all three judging criteria.
2. *“What timely interventions work to mitigate seasonal peaks in undernutrition (both wasting and stunting)?”* This scored particularly highly against ‘answerability’.
3. *“What is the optimal formulation of Ready to Use Therapeutic Food (RUTF) to promote optimal ponderal growth and also support linear growth during and after severe acute malnutrition (SAM) recovery?”* This question scored highly against the ‘usefulness’ criteria.
4. *“What is the role of pre-pregnancy nutritional status in determining risk of being born stunted and/or wasted?”*
5. *“What are the effective packages of interventions for both maternal nutrition and new-born outcomes?”*

Eight of the top ten questions (including the top three) were categorised as ‘research for the development of new interventions/to improve existing interventions’, showing that the group prioritised research that directly related to programming and public health, rather than epidemiological research.

Discussion

The strong support for prioritisation of research related to interventions and programming, as found in this CHNRI exercise, reflects the complexity of underlying causes of wasting and stunting; outcomes that cannot necessarily be predicted from observational research alone. Moving this agenda forward needs greater commitment from funders, academics and implementing agencies to carry out clinical trials or large-scale programmatic evaluations. These must have rigorous designs, adequate sample sizes, and follow-up for health outcomes.

Question 1: “Can interventions outside of the 1,000 days, e.g. pre-school, school-age and adolescence, lead to catch-up in height and in other developmental markers?”

This area has had little attention but could have important implications; for example with adolescent girls where the evidence shows that maternal stature may predict a child’s size at birth. The timing of interventions to promote catch-up growth in mid-childhood and adolescence is not well understood, but may be important. The group

identified further investigation of other lifecycle opportunities (apart from the first 1,000 days), particularly those concerned with adolescent growth, as potentially crucial for meeting undernutrition targets.

Question 2: “What timely interventions work to mitigate seasonal peaks in undernutrition (both wasting and stunting)?”

A number of countries have strong seasonal patterns of stunting and wasting that may illustrate some correlation between the two forms of undernutrition, but there are many unanswered questions in this area. Recent trials have shown the provision of seasonal nutritional supplementation in Niger to have effects on both wasting and stunting (Isanaka et al, 2008). The prioritisation of this question is a call for future studies to measure both wasting and stunting.

Question 3: “What is the optimal formulation of RUTF to promote optimal ponderal growth and also support linear growth during and after SAM recovery?”

This question reflects the fact that few studies of SAM or moderate acute malnutrition (MAM) treatment have looked at linear growth during or after treatment, or compared different formulations of RUTF in trials of adequate size. Where such studies exist, findings suggest no positive effect of RUTF on stunting. However, there is evidence that linear growth ceases or slows down during periods of wasting; therefore timing of restarting linear growth and how to support this during treatment for wasting was considered to be a research priority by this expert group.

Questions 4 and 5: “What is the role of pre-pregnancy nutritional status in determining risk of being born stunted and/or wasted?” and “What are the effective packages of interventions for both maternal nutrition and new-born outcomes?”

There is an increasing call for research on pre-conceptual interventions for improving maternal pre-pregnancy Body Mass Index (BMI), and that can influence adult height in order to benefit foetal growth. Other investigations into support for maternal nutrition could help programmers break the inter-generational cycle of undernutrition.

The study’s main weakness was that a relatively small number of experts were involved in setting the research priorities, and most of these were academics from Western institutions. However, given that the global pool of experts in the field is also small, the results were still regarded as a useful guide for research investment. High-priority research questions are those where trial interventions can inform the appropriate timing of treatment and prevention to impact on both wasting and stunting.

Reference

Isanaka et al, 2008. Isanaka S, Nombela N, Djibo A, Poupard M, Van Beckhoven D, Gaboulaud V, et al. Effect of preventive supplementation with ready-to-use therapeutic food on the nutritional status, mortality, and morbidity of children aged 6 to 60 months in Niger: a cluster randomized trial. *Jama*. 2009;301(3):277–85. doi: 10.1001/jama.2008.1018 pmid:19155454; PubMed Central PMCID: PMC3144630.

* Angood C, Khara T, Dolan C, Berkley JA, WaSt Technical Interest Group (2016) *Research Priorities on the Relationship between Wasting and Stunting*. PLoS ONE 11(5): e0153221. doi: [10.1371/journal.pone.0153221](https://doi.org/10.1371/journal.pone.0153221).

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