

## Preconception and periconception interventions to prevent adverse birth outcomes

This is a summary of the following paper: *Partap U, Chowdhury R, Taneja S et al (2022) Preconception and periconception interventions to prevent low birth weight, small for gestational age and preterm birth: A systematic review and meta-analysis. BMJ Global Health, 7, e007537. <https://pubmed.ncbi.nlm.nih.gov/35948345/>*

**A** growing body of evidence supports the potential benefits of interventions delivered prior to conception regarding the risk of adverse birth outcomes, including low birth weight (LBW), small for gestational age (SGA) deliveries and preterm birth (PTB). However, a better understanding is needed of the effects of such interventions to identify knowledge gaps and inform future prevention strategies.

This article presents findings from a systematic review and meta-analysis examining the impact of interventions delivered during the pre- and periconception (until pregnancy is detected) periods, or from preconception throughout pregnancy, on LBW, SGA and PTB. Of the 58 identified studies, most examined health and nutrition interventions, with little research being carried out on other relevant areas such as environmental health and social interventions. There were also few studies available for any single comparison, limiting the authors' ability to draw conclusions on whether specific interventions – such as food supplementation during preconception and pregnancy versus during pregnancy only – reduce the risk of individual outcomes.

Findings suggested that only health interventions aiming to reduce early adverse pregnancy outcomes were associated with reduced risk of SGA and PTB among women with previous miscarriage. No clear impact on any primary outcome was shown for preconception and periconception nutrition interventions, including multiple micronutrient supplementation, folic acid supplementation with or without iron and food supplementation. Proposed reasons for the uncertainty of evidence included (1) insufficient evidence from a limited number of studies to meaningfully assess impact; (2) relatively short durations (three to six months) of supplementation prior to conception; (3) poor levels of adherence to interventions; and (4) inadequacy of the intervention provided. In low- and middle-income countries (LMICs), where most interventions were implemented, micronutrient or food supplementation delivered in the preconception period may be insufficient to improve pregnancy outcomes, particularly in contexts where the burden of undernutrition remains high among women of reproductive age.

The review highlights the beneficial effects of preconception nutritional supplementation (iron and folic acid or food supplementation) on maternal anaemia during the second and third trimesters, although this was not related to primary outcomes. Provision of preconception and periconception nutritional supplementation containing folic acid was also associated with a reduced risk of birth defects (primarily neural tube defects). Since antenatal care attendance often occurs late during pregnancy in LMICs, these findings suggest potential opportunities to improve maternal micronutrient and anaemic status by extending micronutrient supplementation interventions to the preconception period.

Overall, this review highlights the dearth of relevant high-quality evidence and the need for further well-designed studies on the effectiveness of preconception nutrition, health, environmental and social interventions in preventing adverse outcomes, including LBW, SGA and PTB. The authors suggest that future research should prioritise integrated, multicomponent interventions that address different determinants of preconception health, including women's education, empowerment and equity to infrastructure, as well as water supply and sanitation. Attention should also be given to intervention timing and duration and other underlying characteristics that may affect overall impact, such as preconception nutritional status or geographic region.

## Highlighting two upcoming study protocols on severe acute malnutrition in sub-Saharan Africa

This is a summary of the following papers: *King S, D'Mello-Guyett L, Yakowenko E et al (2022) A multi-country, prospective cohort study to measure rate and risk of relapse among children recovered from severe acute malnutrition in Mali, Somalia, and South Sudan: A study protocol. BMC Nutrition, 8, 90. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9404649/pdf/40795\\_2022\\_Article\\_576.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9404649/pdf/40795_2022_Article_576.pdf)*

*Puett C, King S & Stobaugh H (2022) A multi-country, prospective cohort study to evaluate the economic implications of relapse among children recovered from severe acute malnutrition: A study protocol. BMC Nutrition, 8, 139. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9701364/pdf/40795\\_2022\\_Article\\_631.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9701364/pdf/40795_2022_Article_631.pdf)*

**C**ommunity-Based Management of Acute Malnutrition (CMAM) – where caregivers provide treatment for the majority of children with uncomplicated severe acute malnutrition (or 'wasting') at home – has proven to be an effective and efficient model when compared to traditional inpatient treatment, and also prevents child mortality. However, evidence is growing that recovery may not be sustained after discharge from such programmes (i.e., children are relapsing). Such relapses are costly, both for the children in question and when considering the financial implications of delivering CMAM at scale.

The first study reviewed by this article (King et al, 2022) is a prospective cohort study following children (n > 1,800) aged 6–59 months who have achieved anthropometric recovery following treatment from wasting in Mali, Somalia and South Sudan. Children were matched to community controls (n > 1,100) who were not previously wasted. Individual-, household- and community-level information is planned to be analysed to understand the burden of, and identify risk factors for, relapse, with a specific focus on water, sanitation and hygiene-related exposures. The study will conduct a comprehensive microbiological assessment of participants' drinking water, food, enteric infections, immune function and antibiotic resistance, with the aim of identifying risk factors for different post-treatment outcomes. All data collection is due to be completed by January 2023, prior to analysis.

The second study (Puett et al, 2022) focuses on the same CMAM programmes in Mali, Somalia and South Sudan, but is a sub-study to assess the economic implications of relapse. Cost data will be collected from each programme, covering the four main components of the standard CMAM model (Box 1). The aim of this sub-study is to calculate unit costs for different CMAM service components, and then to conduct a cost-efficiency analysis using these unit costs to assess the financial burden of re-treating children who have relapsed. The researchers state that this study will provide the first estimates to address the limited evidence on the economic implications of wasting relapse in CMAM programmes.

Both studies are being implemented in three countries, each with concurrent and reoccurring humanitarian crises and associated high wasting prevalence. Despite these similarities, these studies will allow the researchers to compare locations with a variety of climates, livelihoods, cultures and political settings, permitting the results to more accurately be extrapolated to other contexts where appropriate.

### Box 1 The four main cost components of a CMAM programme

1. Inpatient treatment for wasted children with medical complications (stabilisation centres)
2. Outpatient treatment for severely wasted children without medical complications (outpatient therapeutic programmes)
3. Outpatient care for moderately wasted children (supplementary feeding programmes)
4. Community outreach services (active case finding and screening, community mobilisation and sensitisation activities)