

## Severe hunger can have lasting effects for gut health, study finds

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A small child in Mumbai, with a shaved head, eating bread with her hand.  
Credit: Wen-Yan King/Wikipedia

Nutrition therapy has saved the lives of millions of malnourished infants,

but may not restore an imbalance in gut bacteria that is key to long-term health and vitality, researchers said Wednesday.

In a paper in the journal *Nature*, the team identified a hitherto invisible and possibly long-lasting complication of severe hunger.

And they said it may help explain why [children](#) in poor or war-struck countries often fail to grow fully and remain sickly after being nursed back to health with special, high-calorie survival foods.

"Therapeutic food interventions have reduced mortality in children with severe acute malnutrition, but incomplete restoration of healthy growth remains a major problem," wrote the study authors from the United States and Bangladesh.

The team studied the gut microbes of healthy children in the Mirpur slum of Dhaka in Bangladesh, and compared them with a group who had been treated for severe acute malnutrition (SAM).

These children had been nursed back to health on either a peanut-based paste or a local, rice-and-lentil-based therapeutic food.

Their [gut microbes](#), mainly bacteria that help digest food and produce certain vitamins, was tested before, during and after treatment.

"Children who were undernourished had a microbial community that was immature, it... was not appropriate for their chronological age," said study co-author Jeffrey Gordon of the Centre for Genome Sciences and Systems Biology at Washington University in St Louis.

"So these children are walking around with a developmental defect involving microbial cells that form an organ, a microbial organ."

The scientists found a short-lived boost in [gut bacteria](#) with [nutrition therapy](#), which reversed four months after treatment was stopped.

"We now have a hypothesis to pursue, which is that healthy growth of children is not fully achievable unless there is proper maturation of this microbial community, and the current treatments are not sufficient to produce an enduring repair," said Gordon.

Co-author Tahmeed Ahmed of the Centre for Nutrition and Food Security in Dhaka said the finding might also point to novel treatments—perhaps a longer period of nutritional therapy for the 600,000 children under five he said were suffering from SAM in Bangladesh and were "at extreme risk of dying".

The team also pointed to potential for treatment with probiotics, which are beneficial microorganisms ingested by humans.

"For example, we can use a medicine in which there will be bacteria, there's bacteria in yoghurt, we can use similar [bacteria](#) that can modulate the microbiota of children with severe [acute malnutrition](#) in a better way," Ahmed said in a podcast recorded by Nature.

The long-term effects of malnutrition include diarrhoeal disease, stunting, impaired vaccine response and cognitive abnormalities.

**More information:** Paper: [dx.doi.org/10.1038/nature13421](https://doi.org/10.1038/nature13421)

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