

## Mass deworming programs have little effect on nutritional status and cognitive development on a population level



*Interventions providing information to stimulate pressure on politicians are not usually effective in improving provider response or service delivery.*

### What is the aim of this review?

This Campbell systematic review evaluates what factors modify the effects of mass deworming for soil-transmitted helminths on nutritional status and cognition in children in endemic helminth areas using individual participant data.

**The effectiveness and cost-effectiveness of mass deworming of children to improve child health and other outcomes is debated. This independent analysis reinforces the case against mass deworming at a population-level, finding little effect on nutritional status or cognition. However, children with heavier intensity infections may benefit more.**

### What is this review about?

Soil-transmitted helminthiasis (STH) and schistosomiasis affects over 800 million people. There is ongoing debate about whether mass deworming of children improves child nutritional status and cognitive development in endemic areas.

### What studies are included?

Randomized trials of mass deworming for soil-transmitted helminths (alone or in combination with other drugs or child health interventions) for children aged six months to 16 years were eligible if they reported at least one of the following outcomes: growth, haemoglobin, serum ferritin, or cognitive processing or development. Trials had to collect data on baseline STH infection intensity, since the main purpose of this review was to assess effect modification across intensity of infection.

Individual participant data was obtained from 19 out of 41 eligible randomized trials. These 19 trials included 31,945 participants) and had an overall low risk of bias.

A secondary analysis added new data to the meta-analysis of STH deworming vs placebo of a previous Campbell review by the same authors. This analysis included 29 randomized trials, with data from two studies which had not published weight gain data and updated effect estimates from three studies based on the data provided by the authors.

These studies were conducted in 11 low- and middle-income countries. Most programs conducted deworming every four months or more frequently. Seven out of 19 studies gave a single dose of deworming.



### How up-to-date is this review?

The review authors searched for studies up to March 2018.

### What is the Campbell Collaboration?

Campbell is an international, voluntary, non-profit research network that publishes systematic reviews. We summarise and evaluate the quality of evidence about programmes in the social and behavioural sciences. Our aim is to help people make better choices and better policy decisions.

### About this summary

This summary is based on Welch, V, Ghogomu, E, Hossain, A, et al. Mass deworming for improving health and cognition of children in endemic helminth areas: A systematic review and individual participant data network meta-analysis. *Campbell Systematic Reviews*. 2019; 15:e1058. <https://doi.org/10.1002/cl2.1058>.

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Children were school-age, with a median of 11 years of age.

### Does deworming improve child health and other welfare outcomes?

Mass deworming for soil-transmitted helminths compared to placebo probably has little to no effect on nutritional status or cognitive development (moderate certainty evidence). Children with moderate to heavy intensity infections of *A Lumbricoides* or *T Trichiuria* may experience greater weight gain (very low certainty evidence). No other differences in effects were found across age, sex or baseline nutritional status.

Findings are consistent for studies at low risk of bias and for other methodological considerations such as completer analyses. There was no trend in effect according to publication year, baseline *A Lumbricoides* prevalence or *T Trichuria* prevalence in the full dataset of 29 studies. Higher baseline hookworm prevalence was weakly associated with greater effects of STH deworming.

### What are the implications of this review for policymakers and decisionmakers?

This analysis replicates the prior findings of small effects of mass deworming at the population level. In areas where there are children with moderate to heavy intensity infections, which are increasingly uncommon, mass deworming may be beneficial, but this analysis was limited by the small number of children with heavy intensity infections in this sample (fewer than 1,000).

In areas with light intensity infections, mass deworming programs probably have very small effects on weight for these children and additional policy options need to be explored to improve child health and nutrition in these areas.

### What are the research implications of this review?

This analysis was severely limited by not being able to obtain individual participant data for many older studies, which may have included children with heavier intensity infections. Greater adoption of calls for open, structured data from trials could maximize the benefit of research to understand effects in the most vulnerable and marginalized populations within these trials.