Evidence Update

Summary of a Cochrane Review — *Child Health Series*

In areas where intestinal worm infection is common, does giving school children deworming drugs improve health and school performance?

Deworming programmes have little or no effect on average weight gain, haemoglobin, height, cognitive ability, school performance, and mortality, even in high endemic areas.

There is not enough evidence to know if deworming improves school attendance.

Cochrane researchers conducted a review of the effects of school-based deworming programmes on children's health, ability to learn, and school attendance. After searching for relevant studies, they identified 44 trials enrolling 67,672 children, and one additional trial of over one million children.

What are deworming programmes and how might they work?

Soil-transmitted worms, including roundworms, hookworms, and whipworms, are common in tropical and subtropical areas, and particularly affect children in low-income areas where there is inadequate sanitation. Heavy worm infection is associated with malnutrition, poor growth, and anaemia in children.

The World Health Organization currently recommends that school children in endemic areas are regularly treated with drugs which kill these worms. The recommended drugs are effective at greatly reducing worm infections, but the programmes are often promoted on the basis of additional benefits on child nutrition, growth, school attendance and performance,

It is important to know whether these additional benefits will be gained, as they influence policy decisions about how money is spent, and potentially prevent investment in other interventions to address the wider problems of nutrition and school attendance.

Review edition

This review was updated in July 2015 and includes a trial of one million children from India and new information from the replication of a trial from Kenya that examined school attendance.

What does the research say?

Deworming programmes that treat all school children at regular intervals:

- May have little/no effect on average weight gain.
- May have little/no effect on average haemoglobin.
- Probably has little/no effect on cognitive ability or exam performance.

We don't know whether deworming improves school attendance.

How much certainty can I have in these results?

We have low certainty in the finding of no effect on weight and haemoglobin because of potential bias in the study methods and some inconsistency in the results between trials.

We have moderate certainty in the finding of no effect on cognitive ability and exam performance.

We are very uncertain whether there is an effect on school attendance due to the limited settings where this has been assessed and the risk of bias of the few studies that have been done.

Can the results of the research be applied to my setting?

Deworming programmes have not demonstrated consistent benefits in any setting, including those with high worm prevalence (15 trials), medium prevalence (12 trials), and low prevalence (10 trials).

Three trials from 15 years ago did suggest important effects on weight gain, but trials published since then have not confirmed these findings.

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The effects of school deworming programmes in areas where worm infection is common

This table provides more detail about what happens when school children are routinely treated with deworming drugs at regular intervals, and are followed up for more than one year, as this provides the best evaluation of what current policy aims to achieve. These numbers are based on the results of the research, when available. The certainty in the evidence is either ranked as high, moderate, low, or very low.

Outcome	No deworming programme	Deworming programme (95% CI)	No. of children (studies)	Certainty of evidence
Mean weight gain (kg)	The mean weight gain ranged from 1.2 kg to 4.73 kg	The mean weight gain with deworming was **0.08 kg more** (from 0.11 kg less to 0.27 kg more)	38,392 (10 studies)	Low
Mean haemoglobin (g/dL)	The mean change in haemoglobin ranged from 0.26 to 1.75 g/dL	The mean haemoglobin with de-worming was **0.02 g/dL higher** (0.08 g/dL lower to 0.04 g/dL higher)	3595 (7 studies)	Low
Cognitive performance (test scores)	-	None of the trials reported a benefit of deworming across multiple tests	32,486 (5 studies)	Moderate
School attendance (%)	The mean school attendance ranged from 66% to 90%	The mean school attendance with de-worming was **2% higher** (4% lower to 8% higher)	20,243 (2 studies)	Very low
Deaths in children	27 per 1000	25 per 1000	1,005,135 (3 trials)	Low

More information

This summary is based on the following open access Cochrane systematic review:
Taylor-Robinson DC, Maayan N, Soares-Weiser K, Donegan S, Garner P. Deworming drugs for soil-transmitted intestinal worms in children: effects on nutritional indicators, haemoglobin, and school performance. Cochrane Database of Systematic Reviews 2015, Issue 7. Art. No.: CD000371. DOI: 10.1002/14651858.CD000371.pub6

What is a systematic review?
A systematic review seeks to answer a well formulated and specific question by identifying, critically appraising, and summarising the results of all relevant trials, published and unpublished, according to pre-stated and transparent methods.

What is Cochrane?
Cochrane is an international network of more than 28,000 people from over 100 countries. The collaboration is one of the biggest producers of systematic reviews on the effects of healthcare interventions, and Cochrane Systematic Reviews are recognized internationally as the benchmark for high quality information. The *Cochrane Database of Systematic Reviews* is available from www.thecochranelibrary.com and free for eligible countries.

How has the certainty in the evidence been assessed?
The certainty in the evidence has been assessed using methods developed by the GRADE working group (www.gradeworkinggroup.org). The level of certainty is judged on a 4-point scale. Evidence from randomized controlled studies is initially graded as high and downgraded by one, two, or three levels after full consideration of: the risk of bias of the studies, the directness (or applicability) of the evidence, and the consistency and precision of the results.

High	We are very certain that the true effect lies close to that of the estimate of the effect.
Moderate:	We are moderately certain in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low:	Our certainty in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect.
Very Low:	We have very little certainty in the effect estimate: The true effect is likely to be substantially different from the estimate of effect.

Evidence Update published in August 2015. *Evidence Updates* can be distributed free of charge.
The full review is available from http://onlinelibrary.wiley.com/enhanced/doi/10.1002/14651858.CD000371.pub6.