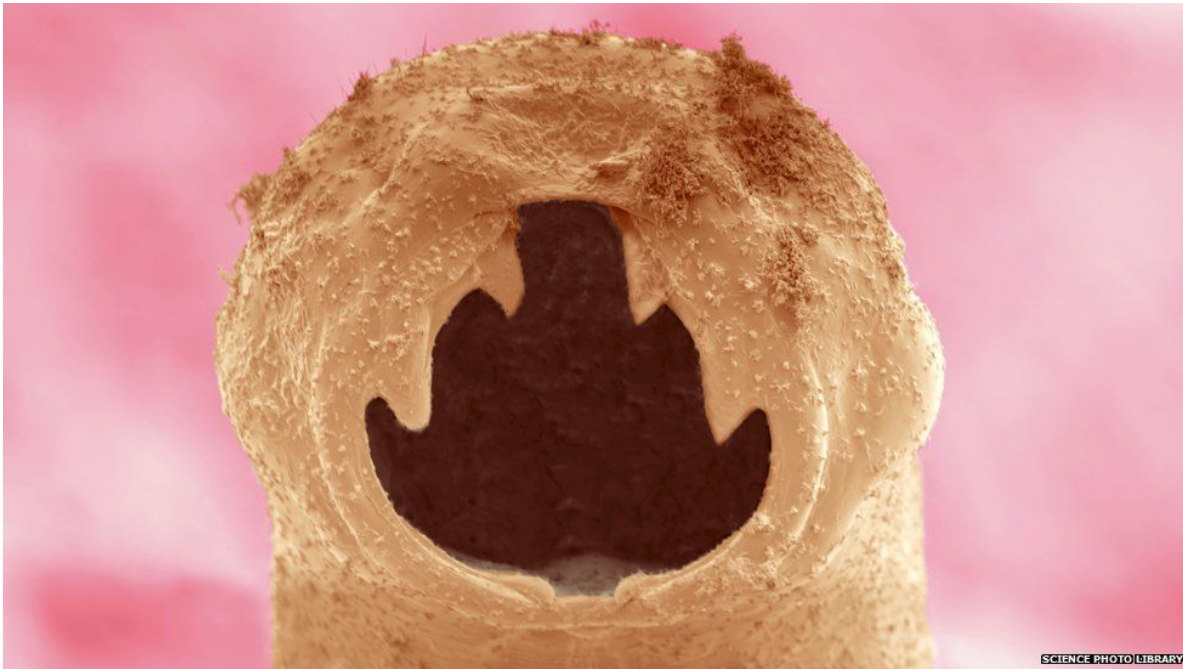


Is it worth treating everyone who might get worms?

 [bbc.com/news/magazine-33972806](https://www.bbc.com/news/magazine-33972806)

By Charlotte McDonald BBC News



About a quarter of the world's population could have worms living in their guts. For many years experts have recommended treating large groups at risk of infection - but is this mass approach worthwhile?

Evidence showing the benefits of large-scale deworming projects has come under scrutiny in recent weeks - the debate has even been dubbed "worm wars".

Parasites, such as roundworm, hookworm (above) and whipworm could be living inside more than 1.5 billion people according to the World Health Organization (WHO).

People are usually infected through contaminated food but hookworm larvae can also burrow into feet, get into blood vessels and make their way to the heart and lungs. From there they can climb up to the oesophagus and be swallowed, ending up in the gut where they grow.

Worms are not usually fatal but in serious cases they can cause abdominal pain, diarrhoea, loss of appetite, weight loss, fatigue and anaemia. In children, they can also contribute to malnutrition, stunted growth, and absences from school.

A nurse gives deworming treatment to a boy in India

Treatment is cheap though - most experts estimate it costs just a few pence to treat someone for a year. This has contributed to the idea that in areas where parasitic worms are common, children should be routinely treated en masse, regardless of whether they are showing any signs of infection - an approach supported by the WHO.

"It's cheap, it's effective," says Justin Sandefur, a research fellow from the Center for Global Development. "Worms are very widespread in lots of poor countries, so I see only upsides and no downsides."

The treatment could improve children's health, their growth, and even their performance at school, he argues.

But the evidence for the benefits of these mass deworming projects has come in for criticism in the past few weeks. In particular, it was reported that one of the most influential studies in Kenya in the 1990s had been "debunked."

The study's authors were two economists, Michael Kremer of Harvard University and Edward Miguel of the University of California, Berkeley. They set up a trial that was highly-regarded by other experts.

Schools were randomly allocated to one of two groups. All the pupils at the schools in the first group were treated for worms, while all the children at the schools in the second group were not given any medication.

The [results showed two interesting findings](#) - firstly, at the schools receiving treatment, attendance was much improved. Secondly, even people in these pupils' wider community benefited, as treated children were less likely to infect others.

Parasitic worm infection

- Parasitic worms are commonly found in countries with poor sanitation and a warm, moist climate
- Larvae (immature worms) are found in soil contaminated with human faeces - people can be infected if their bare skin comes into contact with the earth
- Eating unwashed vegetables which have come into contact with larvae, and drinking contaminated water can also lead to infection
- Larvae move through bloodstream into small intestine where they mature
- Some worms can grow up to 35cm long

[Source: NHS Choices](#)

But a team of epidemiologists at the London School of Hygiene and Tropical Medicine were recently commissioned to perform a replication - that is, to go back to the original data collected in Kenya and double-check everything.

[Their report was published in June](#). They agreed with many of the findings of the original study, but they also found some problems.

"There were very large amounts of missing data in this study," says Professor Richard Hayes, senior author on the replication team. As certain details were not collected at the time of the trial, he says this means they had to be more cautious of the original study's findings.

For example, his team looked at the school attendance figures. "To the credit of the investigators, this was done not just by relying on school registers, which were unreliable, but they made specific visits to see if children were there," he says.

"But what we found when we looked at the data was that far more visits were made in some schools than others, and there were some very odd patterns."

In fact, to Professor Hayes's team, it looked like there had been more visits to schools which received treatment and had high school attendance, and fewer visits to schools without treatment - they felt this was a bias that undermined the findings reported in the original paper.

But one of the original authors, Miguel, says he is "puzzled" because he says further statistical analysis

can be run to see whether that "missing data" would have an impact on the figures, and he thinks it wouldn't.

A deworming programme in Uganda

This is just one study though - so what about other evidence?

[Another report](#), which has analysed a large number of trials, has just been published and also casts doubt on mass deworming projects. Known as a Cochrane Review this type of study brings together all the high-quality trials the team can find - published or unpublished.

One of the review authors, David Taylor-Robinson, says they looked at 45 trials from around the world dating back to the late 1970s. He agrees that individuals who appear to have worms should be treated, but says they found no evidence of mass treatment having an impact on weight, height, haemoglobin, exam performance or mortality.

And what about school attendance? "The evidence there is inconsistent," he says. "We don't know."

| *In the long run, science will be much better off*

Taylor-Robinson and his colleagues argue that there could be other factors affecting the health of these children who often live in poor areas. Furthermore, living conditions are improving in many parts of the world and so the prevalence of worms and the number of serious infections is decreasing.

So why is there such disagreement over what the evidence says? One suggestion is that some of the work advocating deworming has been carried out by economists, while the two recent reports were both by teams of epidemiologists - and that they have different ways of approaching data. For instance, there are some who believe that the Cochrane Review is disregarding a lot of good trials.

"There are good studies with good data which are being excluded because they aren't the purest of pure medical trials," says economist Edward Miguel. He argues that some studies have benefits that the Cochrane Review is not capturing - for example ones with long-term follow-ups.

But Taylor-Robinson thinks that it's right to have a high bar when deciding which evidence is good enough to take seriously. "We've approached this using standard Cochrane methodology," he says. There are economists and epidemiologists who have come out on both sides of this debate, though.

Despite the acrimonious row, there does seem to be a consensus that the scientific community needs to learn how to get into the habit of sharing data, replicate studies and discuss criticism.

"In the long run, science will be much better off," says Miguel.

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