

Deworming improves child cognition. Eventually.

Submitted by Owen Ozier On Thu, 10/16/2014

You could be forgiven if you found deworming to be something of an enigma. Some have hailed it as one of the most cost effective interventions for improving school participation in developing countries [1]. Yet two recent review papers, drawing together the lessons from many studies, find insignificant effects of deworming on learning specifically [2] and only uncertain evidence on cognition [3] more generally. How could this be?

The short answer is that, until a few months ago, both views could be right. I explain why in this 7-minute talk highlighting my recent research [4].

But if you prefer to read rather than watch the video, allow me to explain.

Deworming treats a group of neglected tropical diseases caused by parasitic worms. They are generally not lethal, but they live for the most part in the human gut, and absorb key nutrients (including iron) that would otherwise be nourishing their human hosts. Not long ago, widespread worm infections were problematic not only in the tropics and developing world, but in rich countries as well. Where sanitation was poor, parasitic worms flourished. When, early in the twentieth century, a treatment campaign was rolled out in the American South, it increased school attendance and literacy [9].

This study of deworming in the American South is a rarity. We simply don't have many studies of the impact of deworming on cognition and learning. These outcomes don't change overnight, so only long-run studies are well-positioned to uncover any effects. Without many studies, reviews of the literature are bound to come up short.

To make matters worse, the epidemiology of worm infections may have frustrated many early attempts at answering the question at hand. Treating one person's infections helps everyone around that person by reducing the chance that they are newly infected. This means that studies comparing neighbors who did and didn't receive deworming drugs could find small effects, in part because untreated study participants actually benefit from

medications that their neighbors take (i.e., they don't get worms from their neighbors). This means that – despite appearances – in many older studies, there simply was no real control group that was not impacted by the intervention.

That is where things stood, a few months ago.

But a handful of researchers (myself included) had undertaken long-term follow-ups of cluster-randomized deworming studies. Cluster-randomized means that whole communities were (or weren't) given deworming medications, overcoming the methodological problem that frustrated earlier work. Now, the results are available for all to see.

Kevin Croke follows children who received deworming medication through Child Health Days in Uganda from 2000-2003 (initially studied by Harold Alderman and co-authors ^[10]), and finds that ten years later, children who received deworming medication do better on tests of mathematics ^[11].

Sarah Baird, Joan Hamory Hicks, Michael Kremer, and Edward Miguel follow children who began receiving deworming medication in Kenyan schools in the late 1990s ^[12], and ten years later, find improvements in educational outcomes for women, as well as a variety of beneficial labor market impacts ^[13] for both genders.

And in my work, I go one step further ^[4]: Ten years after the deworming, I found the children who were in infancy when the deworming was conducted in those same Kenyan communities ^[12], and who didn't receive treatment at the time. I looked for them because we know that health in early childhood can have lasting implications. And because the schoolchildren in their communities were dewormed in the late 1990s, infants in those communities faced lower rates of infection than they otherwise would have. I conducted surveys and cognitive tests of these children 10 years later to find out whether their improved health in early childhood – thanks to the deworming of their older siblings and neighbors – had a long-term effect on their cognition. It did. Children whose communities were dewormed before they were one year old perform markedly better on tests of reasoning than their counterparts in communities where deworming began later. ^[4] Remember, in early childhood, these children were not treated directly; they just reaped the spillover benefits of fewer worms in their communities. At this critical period in child development, the effect of deworming is long-lasting and easy to see.

The new evidence has already led to some re-evaluation of the findings about deworming: it looks like it has cognitive benefits, after all [14].

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Links:

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- [2] <http://academics.wellesley.edu/Economics/mcewan/PDF/meta.pdf>
- [3] <http://archive.lstmed.ac.uk/3219/>
- [4] <http://documents.worldbank.org/curated/en/2014/10/20258469/exploiting-externalities-estimate-long-term-effects-early-childhood-deworming>
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- [14] <http://blog.givewell.org/2014/10/03/a-promising-study-on-the-long-term-effects-of-deworming/>
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