

Educational benefits of deworming children questioned by re-analysis of flagship study



**Press release issued by the London School of Hygiene & Tropical Medicine
Embargoed to 00.05 BST [UK time] on Thursday 23 July 2015**

Deworming children may not improve school attendance and the evidence that informs international policy needs to be re-appraised following a major re-analysis by researchers at the London School of Hygiene & Tropical Medicine. Their re-analysis of original data from an influential trial corrected earlier errors and led the researchers to question the finding that deworming children increased school attendance.

The researchers re-analysed data from a trial conducted in Kenya in 1998-99 which reported that a school-based deworming intervention increased school attendance. The trial also concluded that the benefits were passed to children who did not themselves receive treatment due to the prevention of onward transmission of infections.^[1] Those findings have been highly influential due to the substantial benefits that might be gained from use of inexpensive deworming drug treatment. Consequently, deworming school-age children has been hailed as the fourth most effective way of advancing the welfare of developing countries.^[2]

Amid ongoing debate around the deworming evidence, the International Initiative for Impact Evaluation (3ie) commissioned the researchers to carry out the re-analysis of the key Kenyan trial data.^[3] The findings are published as two new papers in the *International Journal of Epidemiology*.

In the first new paper, researchers used the same methods as the original study to re-analyse the trial data from Kenya. They were able to reproduce the majority of the original paper's findings, which found a decrease in worm infections, some evidence of small improvements to nutritional status and no benefit on exam results. However, the researchers found calculation errors in the original authors' data which meant there was no longer evidence that deworming caused an increase in school attendance among children who attended schools near to the schools where children were treated.^[4] The researchers were therefore unable to replicate the finding that attendance was improved in untreated schools.

In the second new paper, researchers re-analysed the school attendance and examination data with methods commonly used by health researchers, rather than those used by economists as in the original study. The new analysis found substantial amounts of missing data, some inconsistent results related to school attendance and data patterns which had the potential to affect the results. The researchers concluded that while the trial provided some evidence of a benefit on school attendance there was a high risk of bias. Both the original study and the re-analysis found no evidence of benefit on exam results.

Study author Dr Alexander Aiken, Lecturer in Infectious Disease Epidemiology at the London School of Hygiene & Tropical Medicine, said: "Many organisations including the World Bank, World Health Organization and Gates Foundation have heavily promoted deworming drug treatments in low-income countries because improved school attendance could potentially benefit educational achievement. Our findings should help these development organisations to develop future policy in this area."

Parasitic worm (helminth) infections affect millions of children in developing countries, causing debilitating illness and holding back their physical development.

Study author Calum Davey, Research Fellow at the London School of Hygiene & Tropical Medicine, added: "Our findings suggest that on the basis of this study alone, we should be cautious about concluding that there are educational benefits from deworming children. It is important that policy is based on rigorous review of the evidence from all relevant studies."

Writing in a linked commentary piece published in the *International Journal of Epidemiology* to coincide with the re-analysis, Professor Paul Garner from the Liverpool School of Tropical Medicine and Co-ordinating Editor for the Cochrane Infectious Diseases Group, said: "Our view is that current promotion of community deworming is certainly a panacea: a single solution to multiple problems in low and middle income countries, and that the belief that deworming will impact substantially on economic development seems delusional when you look at the results of reliable controlled trials."

The two new papers by researchers at the London School of Hygiene & Tropical Medicine are included in an [updated systematic review](http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000371.pub6/abstract) (<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000371.pub6/abstract>) from the Cochrane Infectious Diseases Group on evidence of the benefits of deworming drugs for children, which is also published today (23 July).^[5]

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For more information, copies of the papers or to request interviews, please contact the London School of Hygiene & Tropical Medicine press office on press@lshtm.ac.uk (<mailto:press@lshtm.ac.uk>) or +44(0)2079272802 (tel:+4402079272802).

Notes to Editors

New re-analysis publications:

- Alexander M Aiken, Calum Davey, James R Hargreaves and Richard J Hayes. *Re-analysis of health and educational impacts of a school-based deworming programme in western Kenya: a pure replication*. *International Journal of Epidemiology*. DOI: 10.1093/ije/dyv127
- Calum Davey, Alexander M Aiken, Richard J Hayes and James R Hargreaves. *Re-analysis of health and educational impacts of a school-based deworming programme in western Kenya: a statistical replication of a cluster quasi-randomized stepped-wedge trial*. *International Journal of Epidemiology*. DOI: 10.1093/ije/dyv128

Audio interview with the study authors available for download or embedding at: <https://soundcloud.com/lshmt/calum-davey-alex-aiken> (http://track.vuelio.uk.com/z/?_a=HR0cHM6Ly9zb3VuZGNSb3VklmNvbS9sc2h0bS9jYWx1bS1kYXZleS1hbGV4LWFpa2Vu&r=5234924838&d=1273886&p=1&t=h&h=68f90babdb5996c01ff6aa56ee4279a2) **also

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^[1] Edward Miguel, Michael Kremer. *Worms: Identifying Impacts On Education And Health In The Presence Of Treatment Externalities*. *Econometrica*. DOI: 10.1111/j.1468-0262.2004.00481.x

^[2] Findings from an expert panel at the Copenhagen Consensus 2012, including four Nobel laureates, who gathered to deliberate 32 new economic research papers and analyse the costs and benefits of different approaches to tackling the world's biggest problems. <http://www.copenhagenconsensus.com/copenhagen-consensus-iii> (<http://track.vuelio.uk.com/z.z?l=aHR0cDovL3d3dy5jb3BlbmhhZ2VuY29uc2Vuc3VzLmNvbS9jb3BlbmhhZ2VulWNvbnNlbnN1cy1paWk%3d&r=5234924838&d=1273886&p=1&t=h&h=6772b7042dbc017039feb5899053cd5d>)

^[3] The research was contracted by 3ie as part of its replication funding programme covering selected influential, innovative and/or controversial studies. 3ie is an international grant-making NGO promoting evidence-informed development policies and programmes in low- and middle-income countries. It is a global leader in funding and producing high-quality impact evaluation and systematic review evidence of what works, how, why and at what cost. The three main funders of 3ie are the Bill & Melinda Gates Foundation, UKaid through the Department for International Development and the William and Flora Hewlett Foundation. For enquiries, please contact Radhika Menon on rmenon@3ieimpact.org (<mailto:rmenon@3ieimpact.org>) or [+919582709114](tel:+919582709114). For more information on 3ie, visit www.3ieimpact.org (<http://track.vuelio.uk.com/z.z?l=aHR0cDovL3d3dy4zaWVpbXBhY3Qub3Jn&r=5234924838&d=1273886&p=1&t=h&h=4ea4eaf2124b35976896f873fa78e10>)

^[4] The original study found that as well as children treated for worms having better school attendance, there were also 'spill-over effects' where untreated children in nearby schools appeared to benefit through the prevention of onward transmission of infections, resulting in an estimated total increase in school attendance of 7.5% among treated children. In the re-analysis, the effect on school attendance in intervention schools was similar to those originally found. However, after correction of coding errors, there was little evidence of an indirect effect on school attendance among children in schools close to intervention schools. The estimated total increase in school attendance in treated children was reduced to 3.9%, which was no longer statistically significant.

^[5] To talk to Professor Paul Garner, or to see an advanced, embargoed copy of the Cochrane Review (published 23 July) please contact Diderik van Halsema at the Liverpool School of Tropical Medicine on Diderik.vanHalsema@lstm.ac.uk (<mailto:Diderik.vanHalsema@lstm.ac.uk>) or [+44\(0\)1517053104](tel:+44(0)1517053104) ([tel:+44\(0\)1517053104](tel:+44(0)1517053104)).

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