# Diagnosis of *Ascaris lumbricoides* infections in Ethiopian children and adults by three coprological techniques and two novel serological tests.

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Abstract:
The nematode parasite *Ascaris lumbricoides* is estimated to infect over 800 million people and is considered to be an important neglected tropical disease pathogen. Ascariasis has a substantial impact on public health with routine diagnosis still relying on the detection of eggs in stool. This technique has important limitations in terms of both application and interpretation. Recently, two different ELISA tests were developed in our lab to measure exposure to *Ascaris* infection. In this study, we aim to compare established coprological techniques with these novel serological tests for the detection of *Ascaris* infection and exposure. Stool and serum samples were collected from 600 children and 600 adults from Jimma town in the Western part of Ethiopia. In addition, dried blood spots (DBS) were also collected from 95 individuals. Parasite eggs in each of the stool samples were detected by Kato-Katz, McMaster and Mini-FLOTAC. The collected sera and DBS samples were evaluated for anti-*Ascaris* IgG4 antibody levels using two serological tests. The first ELISA detects antibodies against purified adult *A. suum* haemoglobin (AsHb), while the second detects antibodies directed against an extract of the lung stage larvae of *A. suum* (As-Lung-L3). When the results of all three coprological techniques were combined, a total of 35.2% of children had *Ascaris* eggs in their stool.The highest percentage of infected children were detected by Kato-Katz (31.5%) followed by the Mini-FLOTAC (26.3%) and McMaster (23.7%) technique. Using serology, 24.3% of the children were seropositive on the AsHb ELISA whereas double the amount (48.3%) were positive on the As-Lung-L3 ELISA. No correlations were found between eggs per gram and antibody response. Currently, collection of samples from the adult population and evaluation of DBS samples is still ongoing. All data is expected by this summer and will also be presented in detail. Serology using the As-Lung-L3 ELISA was able to detect a much higher percentage of individuals exposed to ascariasis than when traditional coprology is used. Serology could be a useful tool during certain stages of control programs.