

## Alternative methods needed to detect all schistosomiasis cases

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Tipical housings in the rural area of Brejo do Amparo District, Januária, Minas Gerais. The nearby Tocantins brook passes on the right, which is the only water source for most of the inhabitants. Cisterns are used for water caption during the short rainy season. Credit: Stefan M. Geiger, 2018

To detect detect intestinal schistosome infections, the World Health Organization recommends using the Kato-Katz technique, which analyzes slides of fecal matter. But the approach often misses people who are infected with only a low burden of parasites and, as a consequence, shed only a few eggs in fecal samples. Researchers have now analyzed the efficacy of other testing approaches in a setting with low parasite burden; their results appear in *PLOS Neglected Tropical Diseases*.

Schistosomiasis, or infection with the flatworm Schistosoma mansoni,



affects more than 240 million people worldwide. In some countries including Brazil—control programs have led to a significant reduction in the prevalence and parasite burden of endemic populations. However, in this setting it can be difficult to detect active infections since the Kato-Katz technique loses its <u>sensitivity</u>.

Stefan Geiger, of Brazil's Federal University of Minas Gerais, and colleagues examined 254 individuals in a moderate prevalence area of Northern Minas Gerais, Brazil, using four different approaches to test for intestinal schistosomiasis. The approaches were: the standard Kato-Katz technique, which analyzes slides from up to three <u>fecal samples</u>; a modified Helmintex <u>method</u>, which isolates eggs from 30 g. of feces using magnetic beads; a saline gradient, which cleans 500 mg of feces to detect eggs; and a rapid urine test (POC-CCA) which detects a secreted protein produced mainly by adult worms of *S. mansoni*.

When additional tests were used alongside the Kato-Katz method, the estimated prevalence of schistosomiasis in the population rose 2.3 times, from 20.4% to 45.9%. All methods lost their high sensitivity at low and very low intensity infections. The sensitivity of the POC-CCA (64.9%) was similar to the sensitivity of analyzing six Kato-Katz slides from three fecal samples. The best sensitivity was obtained with the Helmintex method (84%).

"In its present form, Helmintex is not applicable for large-scale screening due to the required sample size and the time-consuming sieving and sedimentation processes, but might be an adequate reference standard or gold standard for the evaluation of newly developed, fieldbased diagnostic tests," the researchers say. "We believe that a combination of methods has to be implemented since the schistosomiasis control programs in different regions of the world are moving from morbidity control towards transmission <u>control</u> and elimination."



**More information:** Oliveira WJ, Magalhães FdC, Elias AMS, de Castro VN, Favero V, Lindholz CG, et al. (2018) Evaluation of diagnostic methods for the detection of intestinal schistosomiasis in endemic areas with low parasite loads: Saline gradient, Helmintex, Kato-Katz and rapid urine test. *PLoS Negl Trop Dis* 12(2): e0006232. <u>doi.org/10.1371/journal.pntd.0006232</u>

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