

New diagnostic tests for soil-transmitted helminthiasis

ABOUT NEGLECTED TROPICAL DISEASES

Neglected tropical diseases (NTDs) affect more than one billion people worldwide, mostly in impoverished communities in tropical and subtropical countries. NTDs cause sickness, disability, pain, and suffering, and often individuals are infected with more than one NTD in their lifetime. The combined effects of NTDs on health and development keep the world's most vulnerable people trapped in a cycle of illness and poverty.

PATH works to accelerate the development and implementation of innovative, high-impact diagnostics for NTDs. We collaborate with partners to identify, develop, evaluate, and commercialize new tests to drive efforts to reach global targets for defeating NTDs. PATH will continue to work to advance new diagnostic tests for NTDs that are rapid, highly sensitive, and appropriate for use in field settings.

ABOUT SOIL-TRANSMITTED HELMINTHIASIS

Soil-transmitted helminthiasis (STH) is a condition caused by parasitic intestinal worms, also known as helminths. STH is the most common NTD—as many as two billion people around the world may be at risk, especially in places with poor sanitation in Africa, Asia, and South and Central America.¹ STH can cause malnutrition, anemia, abdominal pain, and increased susceptibility to other infections. Children with STH can suffer from stunted growth and poor cognitive development. Women of childbearing age are at risk of iron-deficiency anemia. The effect of STH on adults can lead to reduced productivity and economic loss.

Helminths such as roundworm (*Ascaris lumbricoides*), whipworm (*Trichuris trichiura*), and hookworm (*Ancylostoma duodenale* and *Necator americanus*) complete part of their life cycle in the soil. When an infected person's feces contaminate the environment, helminth eggs and larvae enter the soil. Other people become infected



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Soil-transmitted helminthiasis can limit children's growth and learning.

when they accidentally ingest contaminated soil containing eggs (in the case of roundworm and whipworm) or walk on the ground with bare feet, which allows the larvae to enter through the skin (hookworm).

STH can be treated with anthelmintic drugs like albendazole and mebendazole, and the World Health Organization (WHO) recommends annual or biannual community-wide mass drug administration (MDA) to children in areas where STH is a risk. In recent years, new commitments to scale up treatment and prevention efforts for STH have been made by public and private partners in the global health and development sectors. These commitments, formalized through the London Declaration, will accelerate progress towards meeting WHO targets for NTDs.^{1,2} The ultimate goal is to eliminate STH as a public health problem through a combination of treatment and prevention efforts by the year 2020.

NEW DIAGNOSTICS ARE NEEDED FOR SOIL-TRANSMITTED HELMINTHIASIS

There is a need to develop new diagnostics for STH that will support control programs as their focus evolves from reducing morbidity to eliminating the public health problem. The current gold-standard test, known as the Kato-

Katz technique, relies on counting the number of parasite eggs excreted in stool using microscopy. Kato-Katz is sufficient for mapping the distribution of STH to inform control efforts, but it is not sensitive enough to detect low levels of infection, which will become more common as MDA coverage is expanded and sustained. New tests are needed that are more sensitive than Kato-Katz in order to provide control programs with data that can be used to make critical decisions about reducing or stopping MDA in low-intensity settings.

With the input of partners in NTD research and programming, PATH developed target product profiles describing the user needs and technical requirements for new diagnostics for STH. Currently, PATH is exploring options such as recombinase polymerase amplification (RPA), which is an exciting new technology that enables molecular test use in field settings instead of only inside laboratories. Furthermore, PATH is actively developing new methods for sample preparation that will be essential to the field deployability of new RPA assays. PATH is also exploring the potential of diagnosing STH through antigen detection in stool samples, by assessing the feasibility of various biomarkers to detect STH.

FOR MORE INFORMATION

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References

1. Country leadership and collaboration on neglected tropical diseases: Third progress report of the London Declaration. 2015. <http://unitingtocombatntds.org/sites/default/files/document/UTCNTD%20FULL%20REPORT.pdf>.
2. World Health Organization. Accelerating work to overcome the global impact of neglected tropical diseases: A roadmap for implementation. 2012. Available at: whqlibdoc.who.int/hq/2012/WHO_HTM_NTD_2012.1_eng.pdf.



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