



Photo credit: Jennifer Keiser, Swiss TPH

## > Soil-transmitted helminthiasis

### About the disease

Parasitic worm infections are a major public health issue in many tropical and subtropical low- and middle-income countries. Among the leading neglected tropical diseases are soil-transmitted helminth infections or soil-transmitted helminthiasis (STH), which are caused by infections with three types of helminths, including the large roundworm *Ascaris lumbricoides*, the hookworms *Necator americanus* and *Ancylostoma duodenale*, and the whipworm *Trichuris trichiura*.

These infections are transmitted by eggs that come from the intestinal parasitic worms of infected people and are released in feces, which contaminate soil. Roundworm and whipworm infections are transmitted through egg ingestion. This can take place when hands or fingers with contaminated dirt on them are put in the mouth or by consuming vegetables and fruits that have not been carefully cooked, washed or peeled. Hookworm eggs are not infective. They hatch in soil and release larvae that can penetrate the skin of humans. Hookworm infection is transmitted primarily by walking barefoot on contaminated soil. Lack of access to improved sanitation and safe water, and lack of hygiene such as hand washing therefore increase the risk of transmission, as do unsafe nutrition practices.

STH, like other helminth infections, can compromise the nutritional status of infected people and animals and produce multiple health problems, including abdominal pain, diarrhoea, blood and protein loss, and physical and cognitive growth retardation. The resulting morbidity and mortality can debilitate whole communities and contribute to poverty in endemic areas. Children are more susceptible to infection due to their frequent exposure to contaminated environments while playing, sitting or touching the ground with their hands, eating raw vegetables and fruits, or drinking wastewater.

Given the strong associations between helminthic infections and mental, physical, and economic human development, it has become essential to consider disease elimination. Efforts to mitigate the impact of helminth infections will have a direct positive influence on the Sustainable Development Goals, particularly the 'No Poverty', 'Good Health and Well-being', and 'Clean Water and Sanitation' goals.

### Epidemiological data: the disease in numbers

STH has become the most common parasitic disease of humans worldwide.



**>1.5 billion people infected**  
(24% of the world's population)



**Most cases occur in** impoverished, rural areas of sub-Saharan Africa, Latin America, Southeast Asia, and China



**>270 million pre-school-age and 600 million school-age children are at risk** and need treatment & prevention

### Soil-transmitted helminthiasis: The treatment challenge

Less than a handful of drugs are registered for treatment and control of STH in humans, all of which have limitations. Albendazole, mebendazole, levamisole, and pyrantel pamoate are currently on the WHO list of essential medicines for the treatment of STH. Albendazole and mebendazole are widely used in preventive chemotherapy programmes against STH. Whereas albendazole and mebendazole are highly effective against roundworms, they are not very effective against whipworms at single doses. There is therefore a strong need for highly effective and safe drugs against STH infections to reduce the disease burden in endemic countries.

## The HELP consortium

To target helminth elimination, a new consortium of research institutes, universities, not-for-profit organizations, and pharmaceutical companies have joined forces and expertise to establish a research and development pipeline for the development of anthelmintics targeting nematodes. The focus is on STH as well as onchocerciasis.

Called the Helminth Elimination Platform (HELP), this new multidisciplinary platform is funded through the European Union's Horizon 2020 research and innovation programme and will run to September 2024. HELP is led by the Swiss Tropical and Public Health Institute (Swiss TPH), and comprises the not-for-profit research and development (R&D) organization Drugs for Neglected Diseases *initiative* (DNDi), the pharmaceutical companies Bayer Animal Health GmbH (an Elanco company) and Celgene/Bristol-Myers Squibb, and the European and African academic institutions: Institute for Medical Microbiology, University Hospital Bonn, Germany; Muséum National d'Histoire Naturelle Paris, France; Ifakara Health Institute, Tanzania; and University of Buea, Cameroon.



Photo credit: Danielle Powell, Swiss TPH