



Diagnostics to drive elimination of neglected tropical diseases

FAST FACTS

As a group, **neglected tropical diseases (NTDs) affect more than 1 billion people** – and cost economies billions of dollars – every year.¹

NTDs prevail in tropical and subtropical conditions in 149 countries. Poverty, lack of adequate sanitation, and close contact with infectious vectors, domestic animals and livestock adversely increase risks of infection.¹

In sub-Saharan Africa, **NTDs together produce a disease burden that may be equivalent to up to one-half of that for malaria**, and more than double that for tuberculosis.²

17 NTDs are prioritized by the World Health Organization (WHO) in the 2020 Roadmap to overcome their global impact.³

In 2012, governments, non-profit organizations, pharmaceutical companies and WHO signed the **London Declaration to eradicate, eliminate or bring under control 10 NTDs**.⁴

Ending the NTD epidemic is also targeted in UN Sustainable Development Goal 3.⁵



The burden of NTDs puts a strain on entire communities and health systems in a great number of low- and middle-income countries. While impressive strides have been made towards elimination of several tropical diseases, more needs to be done to achieve the goals laid out in the London Declaration. A key part of the challenge is coming up with efficient and affordable diagnostics that allow for testing in community settings. These tools are critical for the interruption of transmission through early identification and improved disease management and control.

– Joseph Ndungu, Head of Neglected Tropical Diseases, FIND

FIND NEGLECTED TROPICAL DISEASES STRATEGY

Our NTD portfolio focuses on diseases with significant unmet diagnostic needs, particularly human African trypanosomiasis (HAT; also known as sleeping sickness), Buruli ulcer, visceral leishmaniasis and schistosomiasis. Our work supports the targets defined in the WHO Roadmap on NTDs and the London Declaration on NTDs – as well as UN Sustainable Development Goal 3 – in two specific areas:

- **Underpin the control and elimination of HAT, Buruli ulcer and visceral leishmaniasis through early diagnosis**
- **Drive elimination of schistosomiasis through improved diagnostics**

¹ World Health Organization. Neglected tropical diseases. www.who.int/neglected_diseases/diseases/en/ (accessed 11 September 2019)

² Hotez PJ & Kamath A. *PLoS Negl Trop Dis* 2009;3(8): e412. <https://doi.org/10.1371/journal.pntd.0000412>

³ World Health Organization. Accelerating work to overcome the global impact of neglected tropical diseases – a roadmap for implementation, 2012. https://apps.who.int/iris/bitstream/handle/10665/70809/WHO_HTM_NTD_2012.1_eng.pdf;jsessionid=6BD7BB814A0CE3AE8E733FC787C84A11?sequence=1 (accessed 28 August 2019)

⁴ World Health Organization. London Declaration on Neglected Tropical Diseases, 2012. www.who.int/neglected_diseases/London_Declaration_NTDs.pdf (accessed 28 August 2019)

⁵ United Nations. Sustainable Development Goal 3. <https://sustainabledevelopment.un.org/sdg3> (accessed 11 September 2019)

Human African trypanosomiasis (HAT, also known as sleeping sickness)

- HAT is a potentially fatal protozoan disease, transmitted to humans through the bite of an infected tsetse fly. *Trypanosoma brucei gambienses* accounts for more than 98% of reported cases.
- It is endemic to 36 sub-Saharan African countries, putting 65 million people at risk and causing regular epidemics just a century ago.⁶
- Following sustained control efforts, HAT has been targeted by WHO for global elimination by 2020.³ In 2009, the number of reported cases dropped below 10,000 for the first time in 50 years; and in 2018, 977 cases were reported. Some countries have recently seen only a handful of cases.⁶
- Early diagnosis and treatment of HAT is essential to avoid disease progression that can result in neurological damage (and death). It is also cheaper to treat and easier to manage the disease during its early stages. However, finding the remaining cases is challenging in remote settings, especially as there are no clinical signs that are specific to the disease.
- FIND and partners have been instrumental in developing new tools for screening and confirmatory HAT diagnosis. We are now developing a second generation rapid test, as well as a combined test that can detect malaria while also screening for HAT. We continue to work closely with governments and national disease control programmes to ensure implementation of these rapid tests.

Buruli ulcer

- Buruli ulcer is caused by *Mycobacterium ulcerans*, a bacterium that belongs to the same family of organisms that causes tuberculosis and leprosy. Its exact mode of transmission is unknown.
- Infection destroys skin and soft tissue, usually on the legs or arms, and without treatment it can lead to long-term functional disability.
- It is endemic in at least 33 countries, with most cases occurring in tropical and subtropical regions. While the number of cases is declining, Buruli ulcer still affects tens of thousands of people. In Africa, nearly half of those affected are children.⁹
- Early diagnosis and treatment is critical to minimizing the impact of the illness and preventing disability or even death. However, there is currently no diagnostic test for Buruli ulcer that is appropriate for the rural health facilities that see most cases. Clinical diagnosis is very often inaccurate, complicated by the fact that other infections can have similar presentation. This lack of fit-for-purpose diagnostics also means that surveillance for the disease is poor.
- FIND and partners are focusing efforts on developing and assessing new tools that can be used for screening and diagnosis in remote settings.

Schistosomiasis (also known as bilharzia)

- Schistosomiasis is caused by parasitic worms. The infection is transmitted when someone comes into contact with contaminated water, allowing the young worms (released by freshwater snails) to penetrate unbroken human skin. The infection triggers immune reactions resulting in progressive organ damage, which can lead to chronic ill-health and ultimately death, if left untreated.
- Over 200 million people are affected in tropical and sub-tropical countries, with most of the burden in sub-Saharan Africa, where 92% of people requiring preventive treatment live.¹⁰
- This disease is controlled through mass drug administration, with 74.3 million people treated worldwide in 2015. Identification of communities that need treatment currently depends on accurate diagnosis requiring multiple samples collected over several days and analysed by highly trained microscopists.¹⁰
- Correct assessment of treatment success is essential as inaccurate results can lead to drug administration programmes being stopped too soon, and infections quickly returning to initial levels. Due to the time and complexity of current diagnostics methods, and the wide distribution of affected populations, rapid diagnostic tests that can be used at the community level are urgently needed.
- FIND and partners are developing rapid diagnostic tests for schistosomiasis control and elimination, which can be used in community settings.

Leishmaniasis

- Leishmaniasis is a vector-borne disease caused by protozoan parasites. It is transmitted to humans when they are bitten by infected sandflies.
- There are three main forms of the disease: visceral leishmaniasis (also known as kala-azar), the most serious form of the disease and usually fatal if left untreated; cutaneous, the most common, causing disfiguring skin lesions; and mucocutaneous, which destroys the mucous membranes of the nose, mouth and throat.⁷
- Over 1 billion people live in endemic areas at risk of infection. While only a small fraction of people infected by *Leishmania* parasites will eventually develop the disease, up to 65,000 people die every year. In the last 5 years, 1 million cases of cutaneous leishmaniasis have been reported.⁸
- Recurrent outbreaks have been a major concern, but elimination efforts are now gaining ground. Non-specific symptoms mean that diagnostic tests are the only way to confirm presence of the disease.
- FIND and partners are developing and evaluating new tests for early and accurate diagnosis and treatment monitoring.
- We are also strengthening laboratory capacity to improve access to visceral leishmaniasis diagnosis, alongside improving local awareness of the disease and the diagnostic procedures/capacity in endemic regions.

⁶ World Health Organization. Trypanosomiasis, human African (sleeping sickness) www.who.int/news-room/fact-sheets/detail/trypanosomiasis-human-african-sleeping-sickness (accessed 29 August 2019)

⁷ World Health Organization. Leishmaniasis www.who.int/news-room/fact-sheets/detail/leishmaniasis (accessed 11 September 2019)

⁸ World Health Organization. www.who.int/leishmaniasis/en/ (accessed 27 August 2019)

⁹ World Health Organization. www.who.int/buruli/disease/en/ (accessed 27 August 2019)

¹⁰ World Health Organization. Schistosomiasis www.who.int/schistosomiasis/en/ (accessed 11 September 2019)