

Policy brief



Diagnostics & disease elimination

What is disease elimination?

Elimination of a disease as a public health problem refers to the reduction of the incidence or prevalence of a particular disease or infection in a defined geographic area, as a result of deliberate efforts.¹ It differs from disease eradication, which is a permanent and worldwide reduction in disease prevalence to zero.

Several diseases are targeted for elimination in different parts of the world, including malaria, viral hepatitis, tuberculosis (TB), and neglected tropical diseases such as sleeping sickness (human African trypanosomiasis; HAT), onchocerciasis, lymphatic filariasis, visceral leishmaniasis, Chagas disease, and schistosomiasis. Elimination requires validation by the World Health Organization (WHO), using criteria specific to each disease.

Some diseases are more difficult to eliminate than others. This is influenced by characteristics of the disease, such as the number of different pathogens causing the disease, the number of different hosts, the presence of identifiable symptoms, the current disease burden, and the effectiveness of available diagnostics and interventions.

Role of diagnostics in disease elimination

Elimination of a disease is achieved through interruption of transmission of the infectious agent, as well as by removal of the agent from the host. This requires identification of infected individuals, animals or environmental sources, followed by treatment or isolation to prevent the disease from spreading. For diseases that cannot be diagnosed visually, diagnostic approaches that can detect the causative pathogen are central to this approach. For some diseases, such as TB and hepatitis C, it is thought that millions of people are unaware that they are infected. Diagnostics are key to detecting these missing millions.^{2,3}

Some neglected tropical diseases, such as schistosomiasis, are managed through mass drug administration (MDA), defined as the administration of a treatment to a particular population or to people living in a defined geographical area, irrespective of whether they have signs of disease. Diagnostics are important for performing mapping surveys to estimate disease prevalence in particular populations or regions, in order to identify regions to target for MDA.

Even after regional elimination of a disease is successful, ongoing surveillance is required to prevent reestablishment. Reintroduction can occur from a range of sources, including animals, travel from areas of higher disease prevalence, and continued low-level circulation of the disease that was previously undetected due to absence of symptoms. Surveillance systems, of which diagnostics are a fundamental component, are essential to detecting and managing infections quickly before they spread and become difficult to control.



Diagnostic gaps in disease elimination

The majority of countries affected by neglected tropical diseases targeted for elimination are low- and middleincome. Affected populations are often rural with limited access to healthcare services. There remains a need for affordable diagnostic tools that can be used at the point of care to support elimination efforts in these countries. As many neglected tropical diseases have animal, vector or environmental sources, diagnostics that can facilitate a 'One Health' approach, with utility across public health, veterinary and environmental health sectors, are beneficial. Country-level capacity to test for diseases such as HAT and visceral leishmaniasis is also needed to accelerate elimination strategies. While effective diagnostics and treatments exist for hepatitis C and TB, there is a need for case finding at the community level in order to identify the millions of people who are unaware of their infection status. Scale-up of testing programmes using diagnostics that can be implemented in the community or in the home as self-tests will be key to elimination of these diseases. TB elimination is further complicated by inactive infections that go undetected, and resistance to treatment makes this disease particularly difficult to treat.

Rapid diagnostic tests for malaria have already made an enormous contribution to management of the disease across the world. However, next-generation malaria diagnostics that can improve accuracy of diagnosis, detect malaria in hardto-diagnose populations, and differentiate between parasite strains, are needed to achieve global elimination goals.

S U M M A R Y

Diagnostics are an essential component of disease elimination strategies,

facilitating screening and active case finding, informing treatment decisions, and preventing re-establishment through surveillance. Investment in diagnostics for key diseases, including neglected tropical diseases, TB, malaria and hepatitis C, is urgently required to support elimination targets.



References

- 1. Dowdle, WR. The principles of disease elimination. Bull World Health Organ 1998;76 (Suppl 2):22–5.
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- 3. World Health Organization. Tuberculosis deaths rise for the first time in more than a decade due to the COVID-19 pandemic. Available at: https://www.who.int/news/ item/14-10-2021-tuberculosis-deaths-rise-for-the-first-time-in-more-than-a-decade-due-to-the-covid-19-pandemic [Accessed 24 February 2023]

ABOUT THIS POLICY BRIEF

FIND accelerates equitable access to reliable diagnosis around the world. We are working to close critical testing gaps that leave people at risk from preventable and treatable illnesses, enable effective disease surveillance, and build sustainable, resilient health systems. In partnership with countries, WHO, and other global health agencies, we are driving progress towards global health security and universal health coverage. We are a WHO Collaborating Centre for Laboratory Strengthening and Diagnostic Technology Evaluation. From time to time, FIND publishes technical briefs and policy briefs on issues relevant to the diagnostics equity agenda. All briefs, including this one, are prepared by FIND staff and reflect FIND's view at the time of publication. Further information on this and other technical briefs and policy briefs can be found on our website at **www.finddx.org**. We also welcome feedback on this and other briefs at **info@finddx.org**.

