

# TUBERCULOSIS

## Challenges and Breakthroughs



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## TB and DR-TB

- TB is a bacterial disease that spreads through respiratory droplets released into the air when people with TB cough. It **most often affects the lungs** (pulmonary TB) but **can potentially infect every other part of the body** (extrapulmonary TB), including the bones, skin, abdomen, lymph nodes and nervous system.
  - The majority of TB strains are susceptible to the first-line anti-TB drugs; in these cases TB is defined as drug-susceptible TB (DS-TB). **When one or more of the first-line drugs to treat TB don't work, it is defined as drug-resistant TB (DR-TB).**
  - The most complex types of DR-TB are multidrug-resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB). **MDR-TB is when the strains are resistant to the 2 most powerful first-line antibiotics (rifampicin and isoniazid); XDR-TB is when they are also resistant to key second-line drugs.**
- Therefore, historically, people with MDR-TB and XDR-TB have had poorer treatment outcomes compared to people with DS-TB.
- TB is linked to poverty; it disproportionately affects poor and marginalised communities. **Most people with TB live in low- and middle-income countries.** In 2021, 87% of TB cases worldwide occurred in the 30 high TB burden countries, and 8 of these countries accounted for more than two-thirds of the global total (global, regional and national TB profiles available [here](#)).
  - People with medical conditions like HIV, diabetes and malnutrition that weaken immunity are at a higher risk of TB infection and death. Children, the elderly, people in regions with high TB rates, and those living in prisons, refugee camps, and crowded slums also face greater risk.

Despite being curable, **tuberculosis (TB) is the world's deadliest infectious disease.** In 2021, a staggering **1.6 million people died —3 people every minute—and 10.6 million people fell ill with TB.**

What makes TB so deadly? Why is it so challenging to find and treat people with TB?  
What tools are currently available to beat the disease?  
This factsheet answers essential questions on TB.

## Diagnosis and treatment challenges in adults and children

- TB is most commonly diagnosed by examining sputum samples, and in many settings, smear microscopy, a technology from the late 1800s, remains the only diagnostic test available. However, microscopy can miss more than 50% of cases.
- Diagnosis through sputum microscopy is suitable only for people with pulmonary TB; patients who have difficulties producing sputum in sufficient quantities, such as children, people living with HIV who are severely sick, and patients who present with extrapulmonary TB, are frequently misdiagnosed through this method.
- Further, sputum microscopy cannot differentiate between DS- and DR-TB. Diagnosing DR-TB requires newer diagnostic technologies or bacterial culture, which are not widely available in low-resource settings and requires several weeks to yield results, respectively.
- In 2021, 4.2 million people with TB were not diagnosed—more than 1 in 3 people with TB. The diagnosis gap for children is even worse, with more than 60% of all children with TB going undiagnosed.
- Without proper diagnosis, people with TB can't get the treatment they need. 96% of children who die from TB are never put on treatment.
- DS-TB can be treated with the most commonly available TB drugs. Treatment involves a cocktail of 4 drugs and takes up to 6 months. Recently, shorter options (of 4 months) have also shown to be effective in specific cases both for adults and children.
- Treatment for DR-TB is longer and more challenging, and until not long ago required up to 2 years of treatment comprising up to 10,000 pills and months of painful injections with intolerable side effects such as nausea, fatigue, deafness and psychosis.



## Breakthroughs in diagnosis and treatment

- In the last decade, **rapid molecular tests such as Cepheid's GeneXpert have revolutionised TB diagnosis**, and are now recommended by WHO. Compared to older methods that are unreliable or take weeks to provide a result, GeneXpert can directly and accurately detect TB and DR-TB in sputum samples in 2 hours.
- Similarly, the introduction of **newer medicines such as bedaquiline, delamanid and pretomanid has paved the way for all-oral, more effective, shorter and safer regimens to treat DR-TB**.
- In December 2022, WHO recommended use of two 6-month regimens consisting of bedaquiline and pretomanid (BPaLM and BPaL) in place of existing, longer regimens to treat DR-TB.
- **But high prices and intellectual property barriers continue to hamper the uptake of these tools by countries.** See, for instance, our ["Time for \\$5" campaign](#) and our report on [access to DR-TB medicines](#).

## MSF and TB

MSF is the largest non-governmental provider of TB treatment worldwide and has been involved in TB care for 30 years, often working alongside national health authorities to treat people in a wide variety of settings, including conflict zones, urban slums, prisons, refugee camps and rural areas. In 2022, MSF treated more than 17,000 people with TB, including 2,300 people with DR-TB, in over 60 TB projects in 41 countries.

MSF has also been involved in efforts to find shorter and safer DR-TB treatment regimens through 3 clinical trials: TB-PRACTECAL, endTB and endTB-Q. The WHO recommendation for two 6-month regimens (BPaLM and BPaL) to treat DR-TB was prompted by evidence mainly from the TB-PRACTECAL trial. We are currently piloting an integrated project (TACTiC) to improve the management of TB in children through the implementation of WHO recommendations, operational research, and advocacy for access to existing tools and development of better tools adapted to children.