

# Tuberculosis and the fight against Antimicrobial Resistance

## Why pay attention to antimicrobial resistance (AMR)?

Antimicrobial agents, such as antibiotics, are essential to treat human and animal infectious diseases. But bacteria, and other microorganisms, have protective mechanisms that will help them develop resistance to antimicrobials, meaning that the antimicrobial drug will be less effective. Development of resistance happens especially when the microbes are frequently exposed to antimicrobials. Therefore, all unnecessary and inappropriate use of antibiotics and other antimicrobials increases the risk that resistance will develop and spread. Unnecessary use happens, for example, when antibiotics are used to treat viral infections, such as the common cold or flu, or as a growth promoter in agriculture. It also happens when antibiotic courses are regularly interrupted.

As a result, the world is running out of effective antibiotics to treat infectious diseases, and unless appropriate action is taken, decades of progress in health and medicine risk being undone. AMR not only costs a lot of money, but also generates a lot of suffering.

In May 2015, the World Health Assembly (WHA) endorsed a global action plan on AMR and urged all Member States to develop national action plans. WHA72 (May 2019) called for an accelerated implementation.

## Why pay attention to tuberculosis (TB)?

TB is caused by the bacterium *Mycobacterium tuberculosis* and it most often affects the lungs. TB is spread through the air by people with pulmonary TB who are not receiving appropriate treatment.

Anyone can be infected with TB and nobody is safe. There are 231,000 estimated TB cases and 20 000 people lose their lives to TB each year in the WHO European Region. However, TB is a curable disease. Rapidly diagnosis and timely initiating the correct therapy stops both the infection in the individual, prevent the development of drug-resistance and its transmission to others. Worryingly, drug-resistant TB has become common in many countries, which significantly complicates treatment strategies. Every third TB patient in the Region has a multidrug- or rifampicin-resistant variant (MDR/RR-TB); and one in four of them has additional resistance to potent second-line medications – fluoroquinolones – leading to pre-extensively drug-resistant TB (pre-XDR-TB). Forty-seven per cent of the world's burden of fluoroquinolone-resistant pre-XDR-TB is in the Region. However, chances of successful outcomes for MDR/RR-TB are much higher with the availability of newly WHO-recommended medicines for TB with proven effectiveness and good safety profiles.

## How can both areas benefit from each other?



Preventing and controlling the development of drug resistance is fundamental to WHO/Europe's work on both AMR and TB. Both areas have great examples of success in terms of policy intervention and implementation through the use of research and innovation. Accurate and rapid diagnosis is key to quickly finding people with TB and putting them on the right treatment path. Using the correct treatment prevents resistance from developing and amplifying and stops further transmission of the infection in society. Chances of cure depend highly on the timely initiation of appropriate treatment that is possible after rapid diagnosis of TB by WHO-recommended molecular testing (mWRD). It is also dependent on strong laboratory services further confirming diagnosis, the availability of medicines for therapy, and the use of approaches focusing on strengthened adherence to treatment. Both AMR and TB benefit from initiatives to improve the quality of diagnosis and capacity-building of health providers. Robust surveillance is crucial for monitoring the development of resistance and ensuring timely action under national AMR and TB strategies and action plans.

## What are WHO/Europe's priorities regarding AMR and TB?

Priorities for action on TB are determined by the three pillars of the WHO End TB Strategy:

1. improving integrated care and prevention;
2. developing and implementing bold policies and supportive systems; and
3. intensifying research and innovation. Each pillar contributes to the prevention of drug resistance. The Region has all the prerequisites to ensure universal access to high-quality prevention, diagnosis, treatment and care for people with TB and DR-TB and achieve reductions in TB incidence and mortality in line with the European Programme of Work (EPW) 2020–2025: United Action for Better Health in Europe.

Priorities for the control of AMR include:

- antimicrobial stewardship (AMS), which refers to interventions aimed at promoting the optimal use of antibiotic agents;
- proof-of-principle projects, supported by WHO/Europe upon a Member State's request, which demonstrate the value of rapid and reliable tests for the appropriate treatment of patients and the surveillance of AMR;
- WHO/Europe support for countries in setting up and strengthening national AMR surveillance and improving diagnostic capacity, in particular through the Central Asian and European Surveillance of Antimicrobial Resistance (CAESAR) network; and
- WHO/Europe support to countries for the implementation of the core components of Infection Prevention and Control (IPC) programmes.



## Achievements so far

Diagnostic methods and access to them have never been better, meaning that today people are more easily and rapidly diagnosed with TB. There has also been progress with the identification of drug-resistant patterns so that patients can rapidly receive the right treatment. One major achievement in recent years has been the introduction of shorter and all-oral TB treatment regimens for drug-resistant TB. This promises to improve compliance and decrease the burden of MDR/RR-TB in the Region. Together with partners from the European Centre for Disease Control and Prevention, a surveillance report is published each year, which gives an accurate picture of the situation in the Region. An annual report from the CAESAR network shows consistent progress.

Massive, open, online courses on drug-resistant TB and Antimicrobial Stewardship for a competency-based approach, have been created and are available in multiple languages on [openwho.org](https://openwho.org). IPC programme guidance was published in 2016 under the title *Guideline on Core Components of IPC Programmes at the National and Acute Health Care Facility Level* with the aim of preventing health care-associated infections and managing AMR both in health care facilities and at the national level. Great efforts have been made to improve access to mWRD, new medicines for MDR/RR-TB, and laboratory quality and surveillance data, and most of the 18 TB high-priority countries in the Region now have national reference laboratories.

## Fluoroquinolones: Where AMR and TB overlap

Fluoroquinolones are a group of broad-spectrum antibiotics used to treat various bacterial infections, such as urinary tract infections, pneumonia, and multidrug- or rifampicin-resistant tuberculosis (MDR/RR-TB). In many countries, because they are affordable, easily available – often over-the-counter – and easy to use with few adverse effects compared to some other antibiotics, they are often misused or over-used. When this happens, the chances of developing resistance are amplified.

Treating TB takes a long time: treating drug-susceptible TB takes six months with affordable first-line anti-TB medications. However, treatment of MDR/RR-TB might require up to 18–20 months with the treatment regimen containing a combination of second-line anti-TB medications. Fluoroquinolone is one of the core agents.

Interrupting treatment – by forgetting to take medicines or losing access to them – results in the development of resistance or its amplification to a wider spectrum. When this happens, the patient develops a form of drug-resistant TB with limited therapeutic options, called pre-extensively or extensively drug-resistant TB (pre-XDR-TB or XDR-TB). Patients with pre-XDR and XDR-TB are left with fewer chances to be cured and they can infect others with the already resistant TB strain.

Losing the effectiveness of fluoroquinolones is problematic because they are tolerated well and easy to take, which makes them very potent antibiotic agents, especially against MDR/RR-TB. If we lose them, it will be much more difficult to treat MDR/RR-TB (as well as some other conditions). As a result, it is essential that fluoroquinolones are properly managed in settings and countries experiencing a high burden of MDR/RR-TB. This means ensuring that:

- correct diagnoses are made;
- fluoroquinolones are not made available over-the-counter;
- fluoroquinolones are made available to patients only upon correct diagnosis and prescription – irrespective if the disease is a complicated urinary tract infection with no other choice of treatment or a case of MDR/RR-TB;
- opportunities for self-medication are eliminated; and
- people-centred models of care and psycho-social support are made available to avoid interrupted treatment and ensure compliance with the treatment regimen.



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**The fight against AMR requires everyone's commitment. Support us by giving this important issue the high priority it deserves, by taking the appropriate decisions and implementing effective measures that keep TB treatable!**

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### Resources and contact

[www.euro.who.int](http://www.euro.who.int) ► Health topics ► Antimicrobial resistance

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