

Antimicrobial resistance

What are antimicrobials?

Antimicrobials are a group of medicines used to treat infections. Antimicrobials take advantage of the structural differences between microorganisms and human cells. They work by either killing the microbe (-cidal mode of action) or inhibiting its growth (-static mode of action).

What is antimicrobial resistance?

Microbes are gaining resistance to antimicrobial medicines. This means some antimicrobials are no longer effective at treating certain infections. In 2016, approximately 700,000 people died due to antimicrobial resistance. If nothing changes, by 2050 antimicrobial resistance could result in 10 million deaths per year.

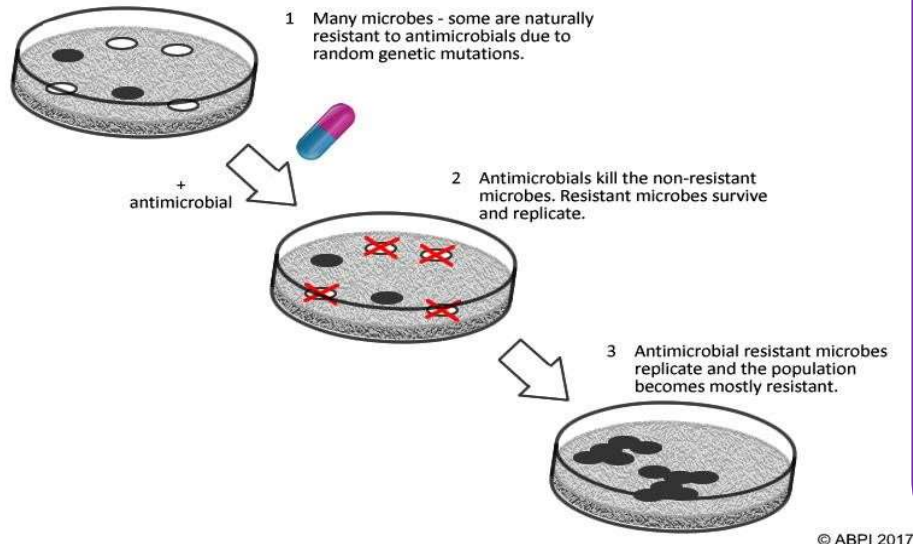
Misuse of antimicrobials

The misuse of antimicrobials speeds up the spread of resistance. Antimicrobials are misused in various ways:

- ❑ inappropriate use (eg skipping doses, not taking a full course, sharing antimicrobials)
- ❑ unnecessary prescriptions
- ❑ uncontrolled access to antimicrobials
- ❑ pollution from drug manufacturing



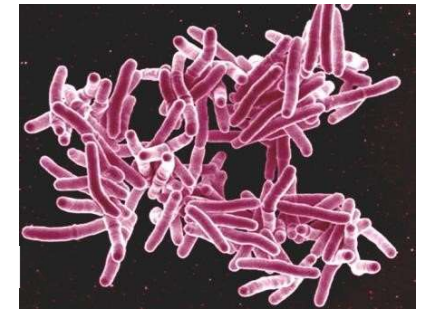
Development of resistance



How can we tackle antimicrobial resistance?

Antimicrobial resistance can be tackled in various ways:

- ❑ increase public awareness and stop misuse of antimicrobials
- ❑ develop rapid diagnostic tools
- ❑ improve sanitation and hygiene
- ❑ resistance surveillance
- ❑ vaccine development
- ❑ develop new antimicrobials
- ❑ develop alternatives to antimicrobials (eg bacteriophage therapy or antimicrobial peptides)



Mycobacterium tuberculosis shown under scanning electron microscopy.

Consequences of antimicrobial resistance

Microbes can be resistant to multiple medicines (often due to multiple resistance mechanisms). This is making some infections difficult to treat. There are specific microbes that are of greatest concern. Extensively drug resistant *Mycobacterium tuberculosis* is one of these. Infections caused by this microbe are resistant to multiple antibiotics and can have mortality rates of 50-60%.