

# Strengthening IPC for Effective Epidemic Preparedness

**FOCAL PERSONS IPC TRAINING**

**Topic: Antimicrobial Stewardship**

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# Outline

- Antimicrobial Resistance (AMR)
- How AMR Occurs
- Why is antibiotic resistance a problem
- Antibiotic Stewardship and Monitoring



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# Antimicrobial Resistance (AMR)

- Antimicrobial resistance (AMR) is a major threat to health and human development, affecting our ability to treat a range of infections.
- Treatments for a growing number of health care-associated infections (HAI) have become less effective in many parts of the world due to increasing incidence of infections becoming resistant to antimicrobials.



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# What is AMR?

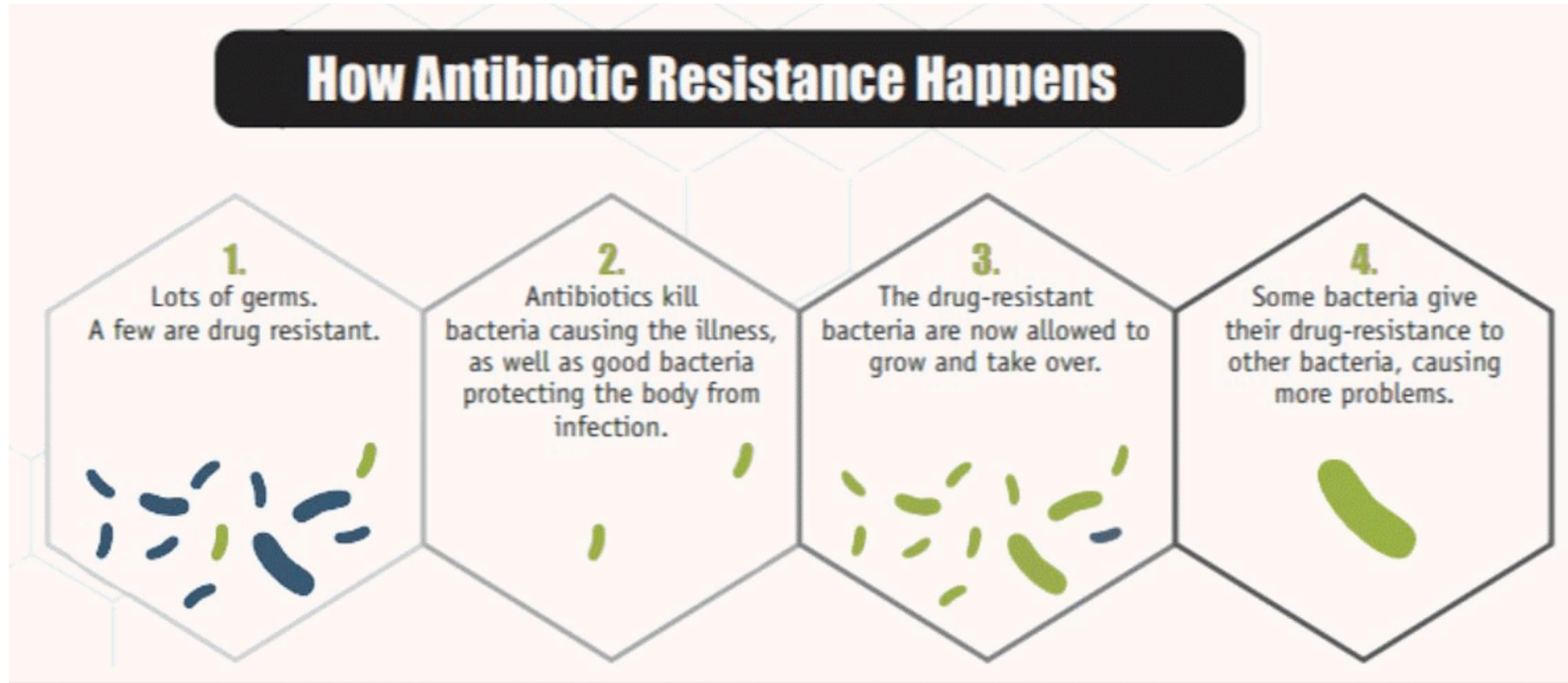
- When an infection caused by a microorganism is no longer treatable by an antibiotic or antiviral, it has developed **antimicrobial resistance**.
- **Anti** means “against,” **micro** means “small,” and bial refers to life.
- In general, resistance develops when microorganisms adapt and grow in the presence of the substance used against them (that is, it resists the effects).



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# How Antibiotic Resistance occurs



# Types of Resistance

- **Intrinsic resistance:** is the natural or innate resistance of bacteria to a particular antibiotic; it depends on the properties of bacteria and their mechanisms of action.
- For example, Gram-negative bacteria are naturally resistant to vancomycin; enterococci are resistant to cephalosporins.
- **Acquired resistance:** is when bacteria become resistant to an antibiotic to which it was previously susceptible.
- This can occur either through chromosomal mutation or by plasmid (genetic material) transfer.
- Bacteria exchange genetic information with each other through conjugation, phage transduction and natural transformation.



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# Why is antibiotic resistance a problem?

- Antibiotic resistance has a significant impact not only on patients, but also on the health care facility and system.
- When bacteria fail to respond to first- or second-line antibiotics, patient morbidity and mortality increase, often resulting in longer hospital stays, thereby placing a greater burden on facilities and the health care system.
- Antibiotic resistance also increases health care costs
- Resistance also means that there is a limited choice of older, “tried and tested” antibiotics whose efficacy and side effects are well known.
- No new registered classes of antibiotics have been discovered since 1987.
- There is a lack of available antibiotics to treat Gram-negative bacteria.



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# Antibiotic Stewardship

- Antimicrobial stewardship plays an important role in preventing antibiotic resistance.
- It promotes appropriate actions for optimizing the use of antibiotics to improve the management of a patient or animal with an infection, while limiting harm.
- Antimicrobial stewardship also promotes sustainable access to effective therapy for all who need them



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# Five Ds of optimal antibiotic therapy

- the right Diagnosis
- the right Drug;
- the right Dose;
- the right Duration of therapy; and
- De-escalation to pathogen-directed therapy.



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# Monitoring of Antibiotic Consumption

- Surveillance of antibiotic consumption is an essential step in the antimicrobial stewardship strategy.
- In some countries, this type of surveillance is already mandatory.



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# Surveillance of HAI/Antibiotic Resistance

- Surveillance of HAI and antibiotic resistance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data about HAIs and resistance to help guide clinical and public health decision-making and action.
- By providing baseline information on infection occurrence, it will help you develop benchmarks for infections in health care settings.
- It can also aid you in describing the microbiological profile of pathogens that cause HAIs.
- Surveillance can detect changes in endemicity of HAIs over time and detect hospital outbreaks.
- Use this surveillance data for research, to make decisions on policy and to set priorities and target activities. Surveillance can also be used to evaluate the impact of IPC measures and reinforce appropriate IPC and patient management practices.



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# Thank You!

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