FAQs on AMR

Q1: What is the difference between antibiotic resistance and antimicrobial resistance?

Antimicrobials, also known as antimicrobial agents or antimicrobial drugs, are a group of medicines that act against a broad spectrum of germs, including bacteria, viruses, fungi and parasites, by killing or inhibiting their growth. Antibiotics are a subset of antimicrobials and specifically target bacteria. Antibiotics, such as penicillin, augmentin, tetracycline, are the most used among the different types of antimicrobials.

'Antibiotic resistance' therefore refers to the bacteria's resistance to antibiotics, while 'antimicrobial resistance' (or AMR for short) is a broader term that includes resistance to medication used to treat infections caused by all types of microorganisms, including bacteria, parasites (such as malaria), viruses (such as influenza, dengue and HIV) and fungi (such as ringworm). Germs, also called microorganisms, that have developed resistance to these medicines may also be termed as 'drug-resistant microorganisms'.

Q2: What are superbugs, why do they develop and how do they spread?

Superbugs are germs (such as bacteria, fungi and viruses) that have become resistant to the medication intended to kill them, making them difficult to treat. Germs, also called microorganisms, naturally develop resistance as a way to protect themselves against such medicines, known broadly as antimicrobials or antimicrobial agents; the more they are exposed to antimicrobials, the faster they develop resistance. Superbugs are also known as 'drug-resistant microorganisms' or 'antimicrobial resistant microorganisms.'

Superbugs include methicillin-resistant *Staphylococcus aureus* (MRSA) and multi-drug resistant *E. coli*. *E. coli* is a more common cause of urinary infections, while *Staphylococcus aureus* can cause skin infections. The resistant strains of these bacteria are more severe and harder to cure, leading to longer illness.

According to the US Centers for Disease Control and Prevention (CDC), superbugs have caused the deaths of at least 23,000 people in the US each year. In 2019 alone, it was estimated that 1.27 million people around the world died from infections caused by antimicrobial resistant microorganisms.

Superbugs can spread from person to person, animal to animal, between animals and people, and through food or through contaminated environments. For example, in some countries, farm animals that are fed antibiotics to encourage faster growth or prevent infections may develop antibiotic-resistant germs. These germs could remain in the meat if the meat is not properly cooked. In hospital settings, they can spread from person to person, or through the hospital environment if precautions to prevent transmission are not practiced.

Q3. What are infections?

Infections are caused by the invasion and growth of harmful germs (also called microorganisms) within the body. These microorganisms can enter the body through various means, such as inhalation, ingestion or through wounds in the skin.

Q4. What is the difference between viruses and bacteria, and why won't antibiotics work on viruses?

Viruses and bacteria are both types of microorganisms, but have several key differences:

1. **Size**: Bacteria are far larger and can be seen under a regular microscope. Viruses are much smaller and can only be seen with an electron microscope.
2. **Structure**: Bacteria are single-celled organisms, with a cell wall and membrane-bound organelles. Viruses are not actual cells; instead, they consist of genetic material (DNA or RNA) surrounded by a coat of protein.
3. **Reproduction**: Bacteria can reproduce independently; viruses can only multiply within a living host cell.
4. **Treatment:** Bacterial infections can be treated with antibiotics, which target the bacteria's cell wall or other essential structures. Antibiotics are NOT effective against viruses as viruses lack these structures. Only antivirals are effective against viruses.

Q5. How do I know if I'm suffering from a viral or bacterial infection?

Bacterial and viral infections can bring about similar symptoms including fever, coughing, sneezing and vomiting, and it may be hard for an untrained eye to distinguish between them. This is why it is important for you not to self-medicate and to seek medical attention when you are ill with a bacterial or viral infection.

Your doctor will typically be able to diagnose the cause of your illness through asking you a series of questions, examining you and with the help of their expertise. Sometimes, additional blood or urine tests, or X-rays may be needed to confirm a diagnosis.

Q6. Will I recover faster from flu if I take antibiotics?

Flu and the common cold are caused by a virus, not bacteria. Antibiotics DO NOT work on viruses and do not speed up recovery from viral infections. Common misuses of antibiotics include using them for viral infections such as flu, the common cold or COVID-19.

Q7. Why shouldn't I keep leftover antibiotics for future illnesses, or share my antibiotics with others?

There are many kinds of germs and many species of bacteria. Different illnesses are caused by different germs and may require different medications. Even among bacteria, some antibiotics work on only on certain types of bacteria. The antibiotics you were previously prescribed for one illness may not be suitable or effective for another illness, even if the symptoms appear similar. This means that what is suitable for you may not be suitable for others and may even worsen their condition.

A doctor's consultation will help determine the type of infection and whether antibiotics are needed.

If antibiotics are needed, the doctor will then prescribe the correct type of antibiotic and in the appropriate dosage that is appropriate for your illness, based on your medical history and symptoms, to treat the infection.

Antibiotics should only be used with your doctor's prescription, as they can help determine the cause of your illness. Taking antibiotics unnecessarily and sharing antibiotics with others to consume can lead to germs developing greater antibiotic resistance, and subsequently increase the spread of AMR.

Q8. What are the side effects of consuming antibiotics?

The side effects of antibiotics usage include diarrhoea, nausea, stomach ache, loss of appetite, rashes and allergic reactions. Symptoms of allergic reaction may include generalized rash, facial, lip or eye swelling and even difficulty breathing in severe cases.

Frequent intake of antibiotics pressures the bacteria to adapt and develop resistance to the antibiotics in order to protect themselves. These surviving antibiotic-resistant bacteria have resistance traits in their DNA that can spread to other bacteria.

Q9: How does vaccination reduce antibiotic resistance?

Vaccination plays an important role in the fight against antibiotic resistance by helping people to build up immunity against certain infections, thereby reducing the risk of infection and the need for antibiotics to treat the infection.

Vaccination can also help to reduce antibiotic resistance by preventing the spread of bacterial infections that would otherwise require antibiotics to treat. When fewer antibiotics are used, there is less selective pressure on bacteria to develop resistance.