



What Are the Different Variants of Antimicrobial Resistance? What Steps Have Been Taken Globally as Well as in India, to Prevent the Incidence of Antimicrobial Resistance? (250 Words / 15 M) (GS-2 Health)

Approach:

1. Intro – define AMR.
2. Mention the different types of AMR.
3. Mention the preventive steps taken – by India & Globally.
4. Conclusion.

Antimicrobials are agents intended to **kill or inhibit the growth of microbes**. They include antibiotics, fungicides, antiviral agents and parasiticides. Disinfectants, antiseptics, other pharmaceuticals and natural products may also have antimicrobial properties. AMR occurs when microbes become resistant to antimicrobial treatments. **Superbugs** are strains of microorganisms that are resistant to most of the medications.

Different Types of Antimicrobial Resistance:

- **Natural (intrinsic, structural) resistance:** This is caused by the structural characteristics of microbes. It has **no hereditary**
- **Acquired resistance:** Due to **changes in the genetic characteristics** of microbes, acquired resistance occurs since it is unaffected by the previous antimicrobial. It occurs mainly due to **structures of chromosomes** or **extra-chromosomal** such as plasmid, transposon, and others.
- **Cross resistance:** Some microorganisms are resistant to a certain **drug** that acts with a **similar mechanism**. However, sometimes it can also be seen in completely unrelated drug groups. This is observed against antibiotics whose **structures are similar**.
- **Multi-drug resistance and pan-resistance:** This means that a particular drug is no longer able to kill or control the bacteria.

Steps Taken to Control Anti-Microbial Resistance :

1) India:

- The Government of India has **banned** the use of **streptomycin** and **tetracycline** in agriculture and the growth promotional use of **colistin** in poultry farming.
- **National Programme on AMR Containment** was launched during 12th FYP in **2012-17**. Under this programme, **AMR Surveillance Network** has been strengthened by establishing labs in State Medical Colleges. 30 sites in 24 states have been included in this network till 30th March 2021.
- **Delhi Declaration on AMR** is an **inter-ministerial consensus** was signed by the ministers of the concerned ministries pledging their support in AMR containment.
- **Red Line campaign:** To **prevent irrational use** of prescription-only antibiotics and



create **awareness on the dangers** of taking antibiotics without prescription.

2) Global:

- Small companies are funded from **public-private partnerships like CARB-X** (the Combating Antibiotic Resistance Bacteria Biopharmaceutical Accelerator). It has provided more than \$360 million in funding for 92 antibacterial projects over the past five years.
- The U.S. enacted the **Generating Antibiotic Incentives Now Act (GAIN Act) of 2012**. It provides benefits to manufacturers of Qualified Infectious Disease Products (QIDPs) including five years of additional non-patent exclusivity.
- The **WHO** launched the **Global Action Plan (GAP) on AMR in 2015**. It outlines five objectives: **(a)** Improve awareness and understanding of antimicrobial resistance through effective communication, education and training; **(b)** Strengthen the knowledge and evidence base through surveillance and research; **(c)** Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures; **(d)** Optimize the use of antimicrobial medicines in human and animal health; **(e)** Develop the economic case for sustainable investment in new medicines, diagnostic tools, vaccines and other interventions.

The development of resistance to antimicrobials is a **major public health problem** all over the world. It makes even minor infections tough to treat, causing severe illnesses and deaths. Hence a clarion call to end this menace must be taken at local, national and global levels that would eventually help in **attainment of SDG 3** i.e., ensuring good health and wellbeing for all.