



Antimicrobial Resistance: Threat to Global Health Security

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Why in News

Antimicrobial resistance (AMR) is a growing global problem to which the ongoing **Covid-19** pandemic may further contribute.

With **resources deployed away from antimicrobial stewardship**, evidence of **substantial preemptive antibiotic use in Covid-19 patients** and indirectly, with **deteriorating economic conditions** fuelling poverty potentially impacting on levels of resistance, AMR threat remains significant.

Key Points

- **Antimicrobial Resistance (Meaning):**
 - Antimicrobial resistance is the **resistance acquired by any microorganism (bacteria, viruses, fungi, parasite, etc.) against antimicrobial drugs** (such as antibiotics, antifungals, antivirals, antimalarials, and anthelmintics) that are used to treat infections.
 - As a result, **standard treatments become ineffective**, infections persist and may spread to others.
 - **Microorganisms that develop antimicrobial resistance** are sometimes referred to as “**superbugs**”.
- **Basis of Antimicrobial Resistance:**
 - **Some bacteria due to the presence of resistance genes** are intrinsically resistant and therefore survive on being exposed to antibiotics.
 - Bacteria **can also acquire resistance**. This can happen in **two ways**:
 - By **sharing and transferring resistance genes** present in the rest of the population, or
 - By **genetic mutations** that help the bacteria survive antibiotic exposure.

- **Reasons for Spread of Antimicrobial Resistance:**
 - The **misuse of antimicrobials in medicine** and inappropriate use **in agriculture**.
 - **Contamination around pharmaceutical manufacturing sites** where untreated waste releases large amounts of active antimicrobials into the environment.
- **Concerns:**
 - AMR is **already responsible for up to 7,00,000 deaths a year**.
 - A **threat to prevention and treatment of infections** - medical procedures such as organ transplantation, cancer chemotherapy, diabetes management and major surgery (for example, caesarean sections or hip replacements) become very risky.
 - **Increases the cost of healthcare** with lengthier stays in hospitals, additional tests and use of more expensive drugs.
 - It is **putting the gains of the Millennium Development Goals at risk** and **endangers achievement of the Sustainable Development Goals**.
 - **No new classes of antibiotics** have made it to the market in the last three decades, largely **on account of inadequate incentives** for their development and production.
 - Without urgent action, we are **heading to antibiotic apocalypse** – a future without antibiotics, with bacteria becoming completely resistant to treatment and when common infections and minor injuries could once again kill.
- **AMR in India:**
 - India, with its combination of **large population**, rising incomes that facilitate **purchase of antibiotics**, high **burden of infectious diseases** and easy over-the-counter access to antibiotics, is an important locus for the generation of resistance genes.
 - The multi-drug resistance determinant, **New Delhi Metallo-beta-lactamase-1 (NDM-1)**, emerged from this region to spread globally.
 - Africa, Europe and other parts of Asia have also been affected by multi-drug resistant typhoid originating from South Asia.
 - In India, **over 56,000 newborn deaths each year** due to sepsis are caused by organisms that are resistant to first line antibiotics.
 - India has undertaken **many activities** like **Mission Indradhanush** – to address low vaccination coverage – strengthened micro-planning and additional mechanisms to improve monitoring and accountability.
 - The Ministry of Health & Family Welfare (MoHFW) **identified AMR as one of the top 10 priorities** for the ministry's collaborative work with the World Health Organisation (WHO).
 - India has also launched the **National Action Plan on AMR resistance 2017-2021**.

Way Forward

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- Since microbes will inevitably continue to evolve and become resistant even to new antimicrobials, we need **sustained investments and global coordination** to detect and combat new resistant strains on an ongoing basis.
 - **Efforts to control prescription of antimicrobials should be accompanied by efforts to educate consumers** to reduce inappropriate demand, issue standard treatment guidelines that would empower providers to stand up to such demands, as well as provide point-of-care diagnostics to aid clinical decision-making.
 - In addition to developing new antimicrobials, **infection-control measures** can reduce antibiotic use. It is critical to ensure that all those who need an antimicrobial have access to it.
 - To track the spread of resistance in microbes, **surveillance measures** to identify these organisms need to expand beyond hospitals and encompass livestock, wastewater and farm run-offs.

Source: TH