



## Fighting the AMR Pandemic

This editorial is based on [“The Lingering Pandemic”](#) which was published in Indian Express on 03/03/2022. It talks about the concerns regarding the spread of AMR (Antimicrobial Resistance).

**For Prelims:** Antimicrobial Resistance (AMR), New Delhi Metallo-beta-lactamase-1 (NDM-1), Antibiotic Stewardship Program (AMSP), GRAM Report, National Action Plan on AMR, WHO-GLASS Portal, One Health Approach.

**For Mains:** Antimicrobial Resistance (AMR) - concerns regarding AMR, challenges to preventing AMR, India's initiatives to prevent AMR.

In the past few years, alarmingly **high resistance rates in pathogens** of public health importance have been reported from Indian hospitals. The Covid-19 pandemic has also raised concerns about the improper use of antimicrobials amongst Covid-19 patients.

The **unnecessary prescription of antimicrobials** amid the Covid-19 pandemic, **unsustainable use of antibiotics** and the **discharge of untreated effluents and wastewater into water systems** has led to an increase in the already high levels of drug resistance in most parts of the world.

### Antimicrobial Resistance (AMR)

#### What is AMR and How Prevalent is it in India?

- **Antimicrobial Resistance** is the resistance acquired by any microorganism (bacteria, viruses, fungi, parasite, etc.) against antimicrobial drugs that are used to treat infections.
  - It **occurs when a microorganism changes over time and no longer responds to medicines** making infections harder to treat and increasing the risk of disease spread, severe illness and death.
  - The [World Health Organisation \(WHO\)](#) has identified **AMR as one of the top ten threats to global health**.
- In India, over **56,000 newborn deaths each year due to sepsis** caused by organisms that are resistant to first line antibiotics.
- A study reported by [ICMR \(Indian Council of Medical Research\)](#) from 10 hospitals showed that **when Covid patients acquire drug-resistant infections** in hospitals, the **mortality is almost 50-60%**.
- The multi-drug resistance determinant, **New Delhi Metallo-beta-lactamase-1 (NDM-1)**, emerged from this region.
  - Africa, Europe and other parts of Asia have also been affected by multi-drug resistant typhoid originating from South Asia.

## What does GRAM Report Present about AMR?

- The [Global Research on Antimicrobial Resistance \(GRAM\) report](#) provides the most comprehensive estimate of the global impact of antibiotic resistance to date.
- According to the report, **1.27 million people died in 2019 as a direct result of AMR** (AntiMicrobial Resistance).
- Lower respiratory infections accounted for more than 1.5 million deaths associated with resistance in 2019, making it the most burdensome infectious syndrome.
- Amongst pathogens, **E coli** was responsible for the most deaths in 2019, followed by **K pneumoniae**, S aureus, A baumannii, S pneumoniae, and M tuberculosis.
  - As per the yearly trends reported by the ICMR, since 2015, **India reports a high level of resistance in all these pathogens**, especially E coli and K pneumoniae.

## What are the Concerns Regarding AMR?

- The growth of AMR has proved to be a **major challenge in the treatment of sepsis**, which is a life-threatening condition and, unfortunately, the failure of antibiotics is **leading to deaths which are preventable**.
- AMR is also **undermining and undoing medical advances made over decades**, especially for high-burden diseases like [tuberculosis](#) and various cancers.
- It is putting the gains of the Millennium Development Goals at risk and **endangers achievement of the Sustainable Development Goals**.
- Untreated wastewater from medical facilities is awash with chemical compounds that **promote superbugs**.
- The concoction of **self-medication and over the counter (OTC) antibiotic availability** has led to one of the **highest rates of antibiotic resistance** in the world.

## What Initiatives have been taken by the Government to Prevent AMR?

- **AMR Surveillance and Research Network (AMRSN)** was launched in 2013, to generate evidence and capture trends and patterns of drug resistant infections in the country.
- The **National Action Plan on AMR** focuses on One Health approach and was launched in April 2017 with the aim of involving various stakeholder ministries/departments.
- ICMR along with **Research Council of Norway (RCN)** initiated a **joint call for research in antimicrobial resistance** in 2017.
- ICMR along with the Federal Ministry of Education and Research (BMBF), Germany has a joint **Indo-German collaboration for research on AMR**.
- ICMR has initiated [Antibiotic Stewardship Program \(AMSP\)](#) on a pilot project across India to **control misuse and overuse of antibiotics in hospital wards and ICUs**.

## What are the Challenges Related to Preventing AMR?

- **Inadequate Information Systems:** The resistance rates reported by the hospitals and laboratories **do not automatically translate to disease burden** unless each resistant isolate is correlated with the clinical outcomes in the patients from whom they were isolated.
  - This has to do with **inadequate hospital information systems** in most public sector funded healthcare facilities in India and many low-middle income countries.
- **Insufficient Fundings: 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.
  - Lack of an urgent action is leading towards an **antibiotic apocalypse** – a future with bacteria becoming completely resistant to treatment.
- **Exclusion of Antibiotic Residues:** In India, **current effluent standards do not include antibiotic residues**, and thus they are **not monitored** in the pharmaceutical industry effluents.
- **Inefficiency of Schemes:** The National Action Plan for AMR, approved in 2017, completes its official duration this year. The **progress under the plan has been far from satisfactory**.
  - Too many players, **missing governance mechanisms** and **absence of funding** are the key impediments to the effective rollout of the scheme.
- **Underreporting in GRAM Report:** Only a fraction of the Indian data, available through

the [WHO-GLASS portal](#), has been included in the GRAM report.

- India has been reporting **high levels of resistance to fluoroquinolones, cephalosporins and carbapenems** across the Gram-negative pathogens that cause almost **70% of infections in communities and hospitals**.

## What Steps Can Be Taken?

- **Multipronged Strategy for Reducing AMR:** Addressing AMR requires a multipronged and multisectoral approach. The urgency to develop new drugs should not discourage us from **instituting measures to use the existing antimicrobials judiciously**.
  - **Improved infection control** in communities and hospitals, **availability and utilisation of quality diagnostics** and laboratories and **educating people about antimicrobials** have proved effective in reducing antimicrobial pressure — a precursor to resistance.
  - All this requires a **comprehensive plan, driven by a designated coordinating agency** backed with suitable funding.
- **One Health Approach:** AMR has the potential to return the world to a pre-antibiotic era when medicines could not treat even simple infections.
  - Therefore, to contain AMR, there is need for a **One Health Approach** through **coherent, integrated, multi sectoral cooperation** and actions, as human, animal and environmental health are integrated.
  - **Development of antibiotic resistance breakers (ARBs)** to restore effectiveness of older classes of antibiotics.
- **Effective Surveillance and Data Management:** It is time to adopt strategies for optimising use of antibiotics across disciplines and exercise prudence across the board including in **pharmaceutical effluent discharge**.
  - **Effective microbiological surveillance** of the agriculture and livestock industry and pharmaceutical manufacturing plants would allow for **informed policy actions to mitigate AMR**.
  - Promoting research to **address the data deficiency around AMR for evidence-based assessment and intervention** will further assist in this fight.

### ***Drishti Mains Question***

Discuss the concerns associated with the spread of antimicrobial resistance and suggest measures to prevent it.