Antimicrobial Resistance

With globalisation and increasing rates of international speed, antimicrobial resistance is increasingly becoming a global problem in need of coordinated systemic action. Antimicrobial resistance is one of the biggest threats to global health, food security, and development today. Antimicrobial resistance can affect anyone of any age, in any country. Antibiotic resistance is the subset of Antimicrobial resistance, it occurs naturally, but the misuse of antibiotics is accelerating in humans and animals.

What is Antimicrobial Resistance?

Antimicrobial Resistance happens when microorganisms such as bacteria, fungi, viruses, and parasites change when they are exposed to antimicrobial drugs such as antibiotics, antifungals, antivirals, and antimalarials. Microorganisms that develop antimicrobial resistance are sometimes referred to as “superbugs”.

With 7 lakh people losing the battle to Antimicrobial Resistance (AMR) per year and another 10 Million projected to die from it by 2050, AMR alone is killing more people than cancer and road traffic accidents combined together. Economic projections suggest that by 2050, AMR would decrease Gross Domestic Product (GDP) by 2 - 3.5 % with a fall in livestock by 3 % to 8 % costing USD 100 Trillion to the entire globe.

India is facing the challenges of combating diseases like Tuberculosis, Cholera, Malaria which are becoming more and more drug-resistant; on the other hand, the emergence of newer multi-drug resistant organisms pose newer diagnostic and therapeutic challenges. Lower awareness about infectious diseases and inaccessibility to healthcare often prevents people from seeking medical help.

Is Antibiotic Resistance same as Antimicrobial Resistance?

Antibiotic Resistance

Medicines that are used to prevent and treat bacterial infections are called Antibiotics. Antibiotic resistance occurs when bacteria change in response to the use of these medicines. When we say antibiotic resistance, it means bacteria are resistant to antibiotics and not humans.

Antimicrobial Resistance

It is a broader term, encompassing resistance to drugs to treat infections caused by other microbes as well, such as parasites, viruses and fungi.

What causes Antimicrobial Resistance?

1. Uneven and unregulated antibiotic usage is one of the most important uses behind the AMR crisis. In developed countries, doctors prescribe antibiotics even for the most basic maladies like the common cold. Solution for it: Stronger regulations of antibiotics prescriptions in these countries, like those implemented in Finland several decades ago, could help in mitigating resistance.
2. Inequalities in access to medicine, excessive use, and poor sanitation services complicate the problem.
3. Farmers using antibiotics to speed the growth of chickens and other livestock, drug-resistant germs find new ways to enter the environment.

How can we prevent Antimicrobial Resistance?

1. The World Health Organisation (WHO) had released guidelines on how each class of drugs should be used to treat 21 of the most common infections.
2. Governments, Medical Associations must also commit to tackling the antibiotic crisis together. India's medical societies adopted the Chennai Declaration to promote steps to tackle stewardship.
3. Implement the formulation by the Indian Health Ministry, control over-the-counter sales of antibiotics.
4. Reduce unnecessary antibiotic use by people and in agriculture.
5. Antibiotics should never be used as unnecessary growth promoters in livestock farming.
6. Prevent infections from happening in the first place with better hygiene, access to clean water, infection control in healthcare facilities and vaccination.
7. Improving the surveillance of superbugs, the UK had committed $ 300 Million to support microbiology surveillance capacity in developing countries.
8. Steps have been proposed to speed up the adoption of state-of-the-art diagnostics in hospitals, clinics, pharmacies, and homes so that unnecessary use of antibiotics can be reduced.
9. Pharmaceutical companies and government agencies are gaining a better understanding of the role that vaccines and alternative therapies could play in reducing antimicrobial resistance.
10. The UK and China agreed to establish a global research and development fund, with the aim of attracting $ 1.5 Billion in investment to reduce the spread of antimicrobial resistance.

Overview of Antimicrobial Resistance in India

1. India is among the nations with the highest burden of bacterial infections.

2. An estimated 4,10,000 children aged five or less die from pneumonia in India annually; with pneumonia accounting for almost 25 % of all child deaths.
3. The crude mortality from infectious diseases in India today is 417 per 1,00,000 persons.
4. The Food Safety and Standards Authority of India (FSSAI) banned the use of antibiotics and several pharmacologically active substances in fisheries.
5. There is no regulation in the poultry industry where many of the commercially available pre-mixed feeds come with added antibiotics.

What causes Antimicrobial Resistance in India?

There is the indiscriminate use of antibiotics in animal farms.

A 2017 report by Centre for Science and Environment states that antibiotic misuse in food animal production is one of the main causes of Antimicrobial Resistance (AMR) in India. It rampantly spreads the resistant bacteria and carries it into human food streams. Industrial-scale food producers engage in intensive farming of animals, which characteristically involves rearing them in high stocking densities and also using high chemical inputs. The emergence of resistance is a natural process, however, due to rampant misuse and overuse of antibiotics, the resistance gets accelerated rapidly.

Some experts are now convinced that the reason for the rapid spread of colistin resistance in humans is not because of indiscriminate use of antibiotics in hospitals but because of indiscriminate use of antibiotics in farms to accelerate the growth of farm animals. Sub-therapeutic, low doses are being fed to farm animals as growth promoters. It is very cheap but very harmful as it leads to colistin resistance in humans. Animals don't need colistin but for humans, it may be a lifesaver. China has banned the use of Colistin in farm animals, the European Union has banned the use of antibiotic growth promoters in farm animals since 2006.

In May 2014, the World Health Assembly requested the development of the Global Action Plan (GAP) on antimicrobial resistance. In May 2015, the Sixty-Eight World Health Assembly endorsed the GAP-AMR to tackle antimicrobial resistance, including the most urgent drug-resistant trend - the antibiotic resistance

The "National Programme on the containment of Antimicrobial Resistance" was launched under the aegis of National Centre for Disease Control (NCDC).

The objectives of this program are

1. Establish a laboratory AMR surveillance system of 30 Network laboratories
2. Generating quality data on AMR for pathogens of public health importance
3. To strengthen infection control guidelines and practices.
4. Promote rational use of antibiotics in both healthcare providers and in the community.
5. Situation analysis regarding the manufacture, use and misuse of antimicrobials.

6. Identify the prescription pattern and establish a monitoring system for the same.

Indian Council of Medical Research (ICMR) established a national network on surveillance of antimicrobial resistance in laboratories based on tertiary care academic centres, targeting medically important index microbes which have been identified by WHO. The Antimicrobial Resistance Surveillance Research Network (AMRSN) established by ICMR started with six reference labs located in four tertiary care medical institutions. The network is being expanded to include 15 more medical colleges/corporate hospitals.

The Government had formed the following 3 committees/groups.

1. Intersectoral coordinating committee
2. Technical Advisory Group
3. Core Working Group

National Action Plan on Antimicrobial Resistance

India released the AMR action plan in 2017, 2 years after the Global Action Plan was released by WHO. Only 2 states Kerala and Madhya Pradesh have State Action Plan.

Goal

1. To effectively combat antimicrobial resistance in India.

3 Objectives of NAP-AMR

1. Define the timeline and allocate the budget to slow the emergence of AMR in India and to strengthen the coordination between various organisations.
2. Strengthen the surveillance, optimise the use of antibiotics in all sectors enhanced investments in AMR activities, research and innovations.
3. Monitor and evaluate the NAP-AMR implementations.

5 Strategic Priorities of NAP-AMR

1. Improve awareness and understanding of AMR through effective communication, training and education.
2. Strengthen knowledge and evidence through surveillance
3. Reduce the incidence of infection through effective infection prevention and control.
4. Optimize the use of antimicrobial agents in health, animals and food.
5. Promote investments for AMR activities, research and innovations.
6. Strengthen India’s leadership on AMR.