Date: 8 - June 2023

ANTIMICROBIAL RESISTANCE (AMR)

This article covers "Daily Current Affairs" and the topic details "Antimicrobial Resistance". The topic "Antimicrobial Resistance" has relevance in the Public Health of the UPSC CSE exam.

Relevance:

For Prelims:

What is AMR?

For Mains:

GS 2: Public Health

Challenges for India in dealing with AMR?

Measures to be taken to address the challenges?

Why in the news?

Since the beginning of negotiations on the Pandemic Treaty, there have been calls from civil society and leading experts to include antimicrobial resistance.

What is AMR?

Antimicrobial resistance (AMR) refers to the ability of microorganisms, such as bacteria, viruses, fungi, and parasites, to evolve and develop resistance to the drugs that are designed to kill or inhibit their growth, known as antimicrobial agents. This resistance reduces the effectiveness of these drugs and makes infections harder to treat.

- **Mechanisms of Resistance:** Microorganisms can develop resistance to antimicrobial agents through various mechanisms. These include genetic mutations, the transfer of resistance genes between microorganisms, and the selection pressure exerted by the misuse or overuse of antimicrobials.
- **Causes of AMR:** Several factors contribute to the emergence and spread of antimicrobial resistance. These include the inappropriate use of antibiotics in human healthcare, such as overprescribing, improper dosing, and failure to complete the full course of treatment. Inadequate infection prevention and control measures in healthcare settings also play a role. In addition, the use of antimicrobials in agriculture, animal husbandry, and aquaculture contributes to AMR, as does the improper disposal of pharmaceutical waste.
- **Consequences of AMR:** Antimicrobial resistance poses significant consequences for public health, patient outcomes, and healthcare systems. AMR leads to increased morbidity and mortality rates as infections become more difficult to treat. It can result in longer hospital stays, higher treatment costs, and increased rates of treatment failure. Moreover, AMR limits the

effectiveness of critical medical procedures, such as surgeries, chemotherapy, and organ transplantation.

- **Global Impact:** AMR is a global health concern with broad implications. It affects all countries, regardless of their level of development. AMR undermines progress in achieving the United Nations' Sustainable Development Goals, including those related to health, poverty reduction, and food security. The spread of resistant infections across borders highlights the interconnectedness of the issue and the need for international collaboration.

Challenges for India in dealing with AMR?

- **High Burden of Infectious Diseases:** India has a high burden of infectious diseases, and the inappropriate use of antibiotics is prevalent. Overuse, misuse, and self-medication contribute to the development of AMR. Addressing these practices and promoting responsible antibiotic use across diverse healthcare settings, including public and private sectors, poses a significant challenge.
- **Limited Surveillance and Data:** Adequate surveillance systems are crucial for monitoring AMR patterns and trends. However, India faces challenges in establishing comprehensive and robust surveillance systems for AMR due to resource constraints, fragmented healthcare systems, and variations in data collection and reporting. Improved data collection, harmonization, and sharing across regions and healthcare facilities are needed.
- **Lack of Awareness and Education:** There is a need to enhance awareness and knowledge about AMR among healthcare professionals, patients, and the general public. This includes promoting understanding about the appropriate use of antibiotics, the consequences of AMR, and the importance of infection prevention and control measures. Educating healthcare providers and patients about the importance of completing full antibiotic courses and avoiding self-medication is crucial.
- **Limited Access to Quality Healthcare:** India's healthcare system faces challenges of accessibility, affordability, and quality of care. Limited access to quality healthcare, especially in rural and remote areas, can contribute to inappropriate use of antibiotics, inadequate diagnosis, and ineffective treatment practices. Ensuring equitable access to quality healthcare, diagnostic facilities, and trained healthcare professionals is essential to address AMR effectively.
- **Agricultural and Veterinary Practices:** Antibiotic use in agriculture, animal husbandry, and aquaculture can contribute to the development of AMR. The challenge lies in regulating and monitoring the use of antibiotics in these sectors to promote responsible use and minimize the spread of resistance. Strengthening regulations, promoting good agricultural and veterinary practices, and raising awareness among stakeholders are necessary steps.
- **Coordination and Implementation:** Addressing AMR requires collaboration among multiple sectors, including health, agriculture, animal husbandry, and environment. Coordinating efforts and implementing policies and guidelines across sectors can be challenging due to diverse stakeholder involvement, governance issues, and the need for sustained commitment and resources.

Measures to be taken to address the challenges?

1. Strengthening Awareness and Education:

- Conduct public awareness campaigns to educate the general public about AMR, responsible antibiotic use, and the importance of completing full treatment courses.

- Develop targeted educational programs for healthcare professionals, emphasizing appropriate prescribing practices, adherence to treatment guidelines, and infection prevention and control measures.

2. Enhancing Surveillance and Data Collection:

- Establish and strengthen comprehensive surveillance systems for AMR, including the collection, analysis, and reporting of data on resistance patterns, antibiotic consumption, and treatment outcomes.
- Encourage standardized reporting of AMR data across healthcare facilities and regions to improve data harmonization and sharing.

3. Promoting Antimicrobial Stewardship:

- Implement antimicrobial stewardship programs in healthcare facilities to promote responsible antibiotic use, including antibiotic prescribing guidelines, antimicrobial use monitoring, and regular feedback to healthcare professionals.
- Develop and implement guidelines for infection prevention and control, emphasizing the importance of hand hygiene, appropriate sterilization, and prevention of healthcare-associated infections.

4. Improving Access to Quality Healthcare:

- Strengthen healthcare infrastructure, especially in rural and remote areas, to ensure equitable access to quality healthcare services, diagnostic facilities, and trained healthcare professionals.
- Promote rational use of antibiotics through regular training programs for healthcare providers, emphasizing appropriate diagnosis, prescription practices, and treatment guidelines.

5. Regulating Antibiotic Use in Agriculture and Animal Husbandry:

- Implement and enforce regulations on the use of antibiotics in agriculture, animal husbandry, and aquaculture to minimize the development and spread of AMR.
- Promote alternatives to antibiotic use in animal health management, such as vaccines, probiotics, and improved animal husbandry practices.

6. Fostering Multi-Sectoral Collaboration:

- Establish inter-sectoral collaborations and coordination mechanisms involving healthcare, agriculture, animal husbandry, environment, and other relevant sectors to address AMR comprehensively.
- Promote research collaborations and knowledge sharing between stakeholders to develop innovative solutions, including new antimicrobial agents and diagnostics.

7. International Cooperation:

- Engage in international collaborations and partnerships to share best practices, knowledge, and resources in addressing AMR.
- Participate in global initiatives and forums to contribute to the development of international guidelines, standards, and policies on AMR.

Source:
https://www.thehindu.com/sci-tech/health/amr-pandemic-instrument-vulnerable-future-pandemics/article66936850.ece

Q.1 Which of the following statements about antimicrobial resistance (AMR) is correct?

1. AMR refers to the ability of microorganisms to develop resistance against antibiotics and other antimicrobial agents.
2. AMR is solely caused by genetic mutations in microorganisms.
3. AMR is a problem limited to human healthcare settings and does not affect veterinary or agricultural practices.

Select the correct option:

(a) 1 and 2 only
(b) 2 and 3 only
(c) 1,2 and 3 only
(d) None of the above

Answer: (a)

Q.2 Which of the following factors contribute to the development of antimicrobial resistance (AMR)?

1. Misuse and overuse of antibiotics in human healthcare.
2. Inadequate infection prevention and control practices.
3. Limited access to healthcare facilities in rural areas.

Select the correct option:

(a) 1 and 2 only
(b) 2 and 3 only
(c) 1,2 and 3 only
(d) None of the above

Answer: (a)

Q.3 Discuss the issue of antimicrobial resistance (AMR), its causes, consequences, and global implications .Discuss the strategies required to combat this growing threat.

Rishabh