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Antimicrobial resistance

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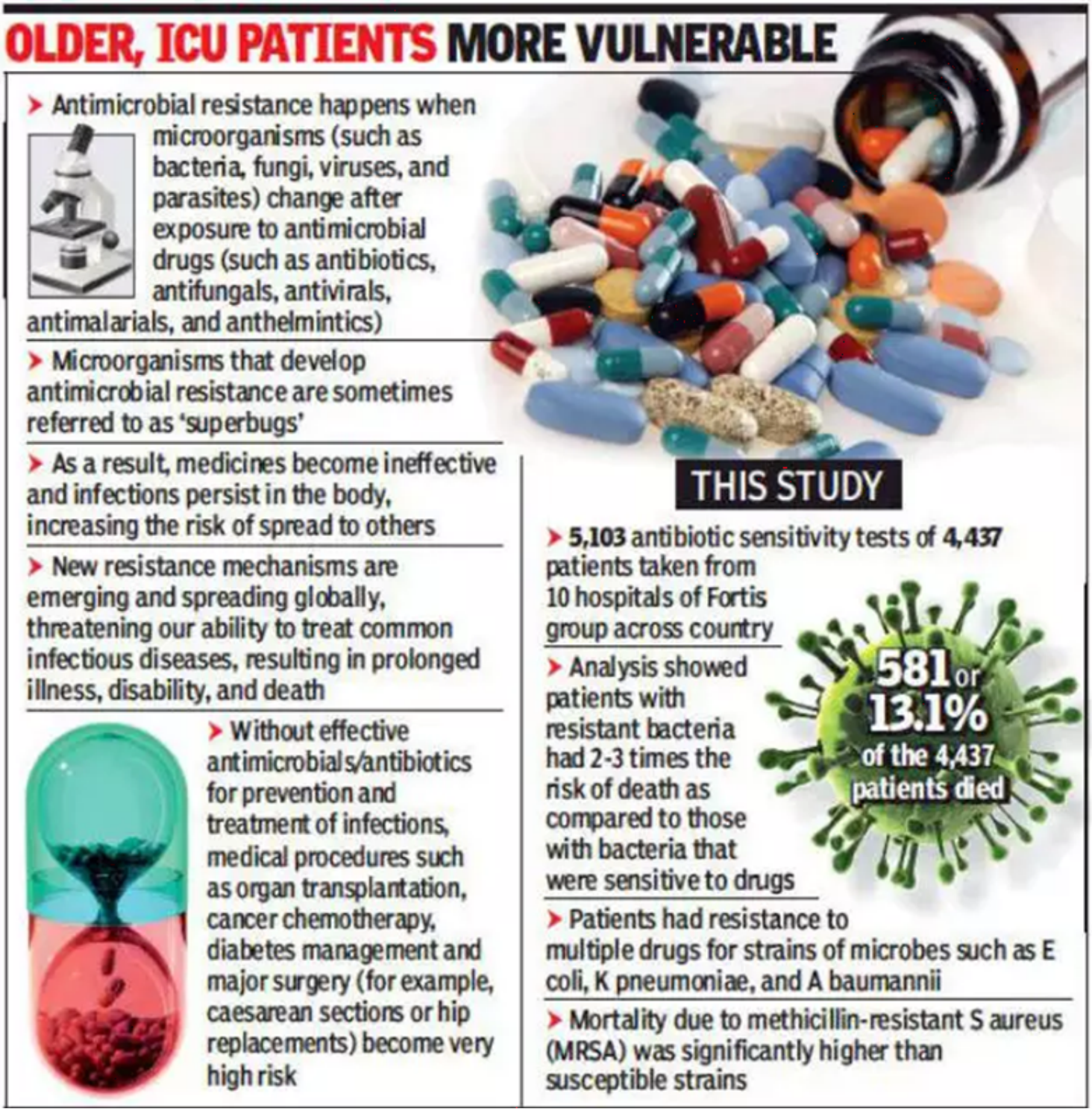
Why is in news? Don’t ignore the threat of antimicrobial resistance

The **Delhi Declaration during India’s G20 presidency** saw a commitment to **strengthen the global health architecture** by building more resilient, equitable, sustainable and inclusive health systems to implement the One Health approach, enhance pandemic preparedness and strengthen existing infectious diseases surveillance systems.

Another important part of this agreement was to **prioritise tackling Antimicrobial Resistance (AMR)** through research and development (R&D), infection prevention and control, as well as antimicrobial stewardship efforts within respective National Action Plans (NAPs).

A pledge to facilitate equitable access to safe, effective and affordable vaccines, therapeutics, diagnostics and other medical countermeasures, especially in Low- and Middle-Income Countries, Least Developed Countries and Small Island Developing States was also undertaken.

About AMR:



India has been referred to as **'the AMR capital of the world** & **we are the largest consumer of antimicrobials globally**. The country is projected to have 1.6 million multi-drug resistant infectious cases in 2040, which is significantly higher than any country.

Antimicrobial resistance (AMR) is a **natural phenomenon** that occurs when **microorganisms such as bacteria, viruses, fungi, and parasites evolve to become resistant to antimicrobial drugs** such as antibiotics, antivirals, antifungals, and antiparasitics that were **previously effective in treating infections** caused by those microorganisms.

AMR occurs naturally over time, usually through genetic changes. Antimicrobial resistant organisms are found in people, animals, food, plants and the environment (in water, soil and air).

They can **spread from person to person or between people and animals**, including from food of animal origin.

Main drivers of antimicrobial resistance:

the misuse and overuse of antimicrobials;

lack of access to clean water, sanitation and hygiene (WASH) for both humans and animals;

poor infection and disease prevention and control in health-care facilities and farms;

poor access to quality, affordable medicines, vaccines and diagnostics;

lack of awareness and knowledge; and

lack of enforcement of legislation.

Prevalence of AMR:

A 2021 report by Lancet, documenting data from 204 countries, **estimated that 4.95 million deaths were associated with bacterial AMR**, and **1.27 million deaths were directly attributed** to bacterial AMR.

The magnitude is equal to that of diseases such as HIV and malaria. **Sub-Saharan Africa and South Asia** had the **highest death rates**, signifying high susceptibility to AMR.

By 2050, up to 10 million deaths could occur annually. If unchecked, AMR could shave US$ 3.4 trillion off GDP annually and push 24 million more people into extreme poverty in the next decade.

A 2022 study by the **Indian Council of Medical Research (ICMR)** revealed that resistance to broad-spectrum antimicrobials **increases by 5% to 10% every year**.

Impacts of AMR:

A report by the World Bank Group entitled “Drug Resistant Infections: A Threat to Our Economic Future”, highlighted that, **drug-resistant infections have the potential to cause a level of economic damage** similar to—and likely worse than—that caused by the 2008 financial crisis.

Annual global GDP could decrease by approximately 1% and there would be a 5–7% loss in developing countries by 2050.

AMR leads to **higher medical costs**, prolonged hospital stays, and increased mortality and morbidity, and decreased productivity.

As natural environment is an important reservoir of AMR, the release of antimicrobial compounds into the environment leads to contamination of soil and water, and gene pollution and alteration in the wildlife.

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.

Without urgent action, the **world is 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.

Antimicrobial resistance is putting the gains of the **Millennium Development Goals at risk** and endangers achievement of the Sustainable Development Goals.

Measures/efforts to overcome AMR:

At Global level:

AMR may not be as palpable a pandemic as Covid-19, but with an **annual death toll in the same order of magnitude**, it represents a clear and present danger. The same impetus, investment and prioritisation as Covid-19 needs to be applied to AMR.

Indonesia has developed national surveillance plans, **Australia** prioritised animal health and committed to reducing antibiotic use in livestock, **Brazil** has shown reduction in antibiotic use in humans and the **UK and the US** are investing in research to develop new diagnostics, drugs and vaccines.

In 2015, the **WHO launched the Global Action Plan (GAP) on AMR**, which provides a strategic framework for countries to develop their national action plans.

WHO launched the **Global Antimicrobial Resistance and Use Surveillance System (GLASS)** in 2015 to continue filling knowledge gaps and to inform strategies at all levels.

World Antimicrobial Awareness Week (WAAW) held annually since 2015, WAAW is a global campaign that aims to raise awareness of antimicrobial resistance worldwide and encourage best practices among the general public, health workers and policy makers to slow the development and spread of drug-resistant infections.

At the Third Global High-Level Ministerial Conference on Antimicrobial Resistance held in Muscat, over 30 countries adopted the **Muscat Ministerial Manifesto on AMR**.

The Muscat Manifesto recognised the need to accelerate political commitments in the implementation of One Health Action for controlling the spread of AMR.

India's efforts:

India has also taken steps in the right direction. By expanding the scope of existing surveillance and monitoring networks, promoting responsible behaviour among citizens and encouraging collaboration among nations, India can lead the way in reducing the burden of AMR.

The **National Action Plan on Antimicrobial Resistance** (2017-21) emphasised the effectiveness of the government's initiatives for hand hygiene and sanitation programmes such as Swachh Bharat Abhiyan, Kayakalp and Swachh Swasth Sarvatra.

The government has also attempted to **increase community awareness** about healthier and better food production practices, especially in the animal food industry.

The **National Health Policy 2017** also offered specific **guidelines regarding use of antibiotics**, limiting the use of antibiotics as over-the-counter medications and banning or restricting the use of antibiotics for growth promotion in livestock.

It also called for **scrutiny of prescriptions** to assess antibiotic usage in hospitals and among doctors.

India has established the **National AMR Surveillance Network** to monitor and track the prevalence and patterns of AMR across the country. This surveillance system helps in generating data for evidence-based interventions.

AMR and G20:

G20 countries are home to over 60 per cent of the world's population. Now, Africa, with 17.89 per cent of the global population, is also a part of the coalition.

It will have profound implications for low and middle-income countries with low investments in healthcare infrastructure.

For the intent of the declaration to translate into implementable action, it will require concerted global and local effort.

Some key areas can be prioritised:

At the global level:

G20 would be to **work with developing countries** to **create regional AMR action plans**. Most G20 countries have well-developed NAPs. But their efficacy varies with policy, planning, performance and patient and public engagement.

G20 countries should consider championing an **international funding mechanism** that focuses on AMR R&D.

Efforts should be made to **promote patent reforms** for fostering innovation and ensuring affordability in new antibiotics. Dialogue among developing countries to explore models like the Medicines Patent Pool will be useful.

At the local level:

Countries need to **prioritise implementation of NAPs**.

India was one of the first countries to develop a **comprehensive NAP on AMR** (NAP-AMR) in 2017. It saw sub-optimal implementation because of the absence of leadership and resources.

There has been a **special focus on surveillance and research** under the NAP-AMR, both for innovative affordable interventions and implementation.

We must **expand the scope of existing monitoring networks**, currently limited to a few tertiary care hospitals, to understand the extent of the problem.

Government initiatives like **Free Diagnostic Services and Kayakalp**, strict protocols under Indian Public Health Standards have the potential to strengthen AMR containment efforts.

Another area that requires attention is **promotion of responsible behaviour among citizens** by educating people on the dangers of overusing antibiotics.

Involving academia and civil society organisations (CSOs) in these efforts is essential.

Academia can help understand the environmental dimensions of AMR better, develop new technologies and provide training and education to healthcare professionals.

CSOs can raise awareness and advocate for policy changes. Eg; TB and HIV/AIDS programs, where CSO engagement led to major advancement in increasing coverage of the programs.

Challenges related to preventing AMR:

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.

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.**

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.

Under-reporting in GRAM Report: Only a fraction of the Indian data, available through the WHO-GLASS portal, has been included in the GRAM report.

Way Forward:

The global challenge to address AMR goes beyond the production of new antibiotics and therapies.

Reducing demand for new antibiotics through **public awareness**, infection prevention and control, **effective diagnosis and surveillance** of antibiotic-resistant infections and antibiotic use, with a **One Health perspective** are crucial when dealing with this problem globally.

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.

AMR has the **potential to return the world to a pre-antibiotic era** when medicines could not treat even simple infections.

It is time to **adopt strategies for optimising use** of antibiotics across disciplines and **exercise prudence** across the board including in pharmaceutical effluent discharge.

Conclusion:

Addressing the global challenge of AMR demands a **collective and coordinated effort** involving various stakeholders. Embracing novel solutions, such as new diagnostics, alternative treatments, and technology-driven interventions, is essential. By embracing these measures, we can protect public health, alleviate economic burdens, and secure a healthier future for all.