

Antibiotic Pipeline Running Dry: India's Growing Antimicrobial Resistance Crisis

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Antimicrobial Resistance Latest News

- India is facing a growing threat from **antimicrobial resistance** (AMR) driven by widespread antibiotic overuse. In 2021, an estimated 2.67 lakh deaths were linked to AMR.
- Key data point to alarmingly high resistance levels — including evidence that 83% of Indians carry drug-resistant bacteria — alongside major treatment gaps and widespread antibiotic misuse, rendering routine infections harder to treat and threatening the foundations of modern medicine.
- Experts warn that the global antibiotic pipeline is nearly dry, with few genuinely new drugs in development, putting modern medicine at serious risk.

Antimicrobial Resistance in India: A Growing but Largely Invisible Crisis

- Antimicrobial resistance (AMR) is emerging as a silent pandemic in India, intensifying both within hospitals and in the community.

- High antibiotic use in hospitals creates strong pressure on bacteria to evolve resistance through genetic mutations, which then spread rapidly via resistance genes, fuelled by antibiotic misuse.
- Patients often enter hospitals for unrelated conditions such as heart or kidney disease but acquire drug-resistant infections during treatment, sometimes with fatal outcomes.
- This hidden pathway makes AMR difficult to quantify accurately. Reliable global estimates only began emerging in 2021, and even now, comprehensive data remains limited.
- Beyond hospitals, common community infections such as typhoid, diarrhoea and pneumonia are increasingly becoming drug-resistant.
- Given that India accounts for about **18% of the world's population**, roughly one-fifth of global infections are estimated to occur in the country, underscoring the scale of the challenge despite the absence of precise national figures.

Behaviour Drives Antibiotic Overuse in India

- Antibiotic misuse in India is largely behavioural. Many people take antibiotics for common ailments like coughs, colds or diarrhoea without confirming whether the infection is bacterial.
- Antibiotics are often taken on pharmacists' advice or prescribed prophylactically by doctors, reinforcing habitual overuse. This behaviour needs urgent correction.

A Drying Antibiotic Pipeline

- Although a few antibiotics have been approved in recent decades, almost none belong to new drug classes or use novel mechanisms.
- With no strong replacements in sight, continued misuse risks exhausting the effectiveness of existing drugs.

Treating Routine Infections Is Getting Harder

- Drug-resistant infections now require stronger, last-resort antibiotics.
- Even community infections like UTIs and typhoid are becoming harder to treat due to repeated inappropriate antibiotic use.
- Resistance to **fluoroquinolones** in ***Salmonella typhi*** is rising, while overuse of ceftriaxone and azithromycin risks rendering them ineffective.
- However, resistance can reverse when drugs are withdrawn, as seen with older typhoid medicines regaining effectiveness.

Role of Antibiotic Stewardship

- Antibiotic stewardship is the effort to measure and improve how antibiotics are prescribed by clinicians and used by patients.
- Stewardship programmes are more effective than sudden bans. **Kerala's antimicrobial stewardship programme**, launched in 2015, focused on rational prescribing and awareness.
- Only after nearly a decade did the state ban over-the-counter sales, with reasonable success. Responsible use requires public understanding, not just regulation.

Role of Livestock, Environment and Humans

- High resistance levels in humans are largely driven by human antibiotic use, not livestock.
- Studies by ICMR found significant overlap of resistance genes between human and hospital environments, but minimal overlap with animals.
- A key concern is antibiotic residues in food, which persist in the gut microbiome and act as a reservoir for resistance.

Data Gaps Limit the Full Picture

- India's AMR data mainly comes from 25 tertiary hospitals under the ICMR network, where resistance rates are higher due to prior hospitalisation and antibiotic exposure.
- This limits nationwide representation. Wider surveillance, similar to Japan's system covering around 2,000 hospitals, is needed.

Exploring Alternative Therapies

- Phage therapy, which uses bacteria-eating viruses, shows promise for infections like UTIs but requires precise matching and often virus combinations.
- Resistance can develop even here. Monoclonal antibodies are another emerging option, though still in early stages of development.

Source: IE

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