World Health Organization India

sameeksha

ANTIMICROBIAL RESISTANCE (AMR) | Volume 36 | June 2025

AMR *Sameeksha**

Highlights

- WAAW 2025 theme is – *Act Now: Protect Our Present, Secure Our Future*
- Epidemiology and clinical outcome of common MDR gram-negative bacterial infections in Indian hospitals
- Global trends in inappropriate use of antibiotics, 2000–2021
- Combating AMR with biogenic silver nanoparticles
- Leveraging artificial intelligence to combat AMR in geriatric care
- Association between national action and trends in antibiotic resistance across 73 countries, 2000 – 2023

1) Awareness and understanding

World AMR Awareness Week 2025

- Theme of World AMR Awareness Week (WAAW) 2025 is – *Act Now: Protect Our Present, Secure Our Future;* highlighting the urgent need for bold, coordinated, cross-sectoral action to address AMR.
- Aims to encourage best practices among all stakeholders – the public, healthcare workers, animal health professionals, environmentalists, farmers, policymakers, the youth, civil society and media – who play a critical role in reducing the further emergence and spread of drug-resistant pathogens.

Quadripartite Joint Secretariat | WAAW announcement | 18 June 2025 | Online link

Addressing environmental drivers of AMR: new guidance for antimicrobial waste management

- Webinar (part of WHO's global series supporting national action plans on antimicrobial resistance) provides highlights of two global guidance documents on waste management for manufacturing of antibiotics and managing pharmaceutical waste from health care facilities.
- Highlights that control of pollution from antibiotic manufacturing and unused pharmaceuticals is important for safeguarding the efficacy of antibiotics for all.

WHO | News | 12 June 2025 | Online link

Educational resources for pharmacy students

- Provides educational resources on AMR to support pharmacy curricula, classroom engagement, and community outreach.
- Includes resources for organizing an AMR workshop, games and activities (including case studies, AMR quiz, two-truths-and-a-lie, taboo AMR edition) and AMR awareness material, including posters, comics and infographics.

Superheroes Against Superbugs | Technical resources | 17 April 2025 | Online link

2) Laboratories and surveillance

Epidemiology and clinical outcome of common multi-drug resistant gram-negative bacterial infections in a network of hospitals in India (IMPRES): a multicenter intensive care unit-based prospective clinical study

- Observational study across 19 Indian ICUs assesses resistance patterns, treatment, and 28-day mortality in patients infected with *E. coli*, *K. pneumoniae*, *A. baumannii* and *P. aeruginosa*.
- Finds a high prevalence of AMR in Indian ICUs, with an overall crude mortality rate of 23.5%. Although not statistically significant, patients with carbapenem and colistin resistant isolates had higher risk of dying.

Indian Journal of Critical Care Medicine | Original article | 5 June 2025 | Online link

Breakpoint withdrawals and emerging evidence: reframing clinical decisions for *B. cepacia complex* and *S. maltophilia*

- Outlines the impact of breakpoint withdrawals by CLSI and EUCAST on antimicrobial susceptibility testing (AST) interpretation and treatment strategies for *Burkholderia cepacia complex* and *Stenotrophomonas maltophilia.*
- Highlights the need for MIC-based, genomics-informed approaches to guide therapy for these pathogens, given challenges such as misidentification and limited therapeutic options.

Indian Journal of Medical Microbiology | Original research article | 25 June 2025 | Online link (abstract only)

Carbapenem-resistant *Acinetobacter baumannii*: prevalence, phenotypic and genotypic analysis in cases of ventilator associated pneumonia from a teaching hospital in Delhi, India

- Reports high prevalence of OXA-23, AmpC, NDM-1, and VIM-1 in carbapenem-resistant *Acinetobacter baumannii* (CRAB) isolates from ventilator-associated pneumonia cases.
- Underscores the urgent need for targeted infection control and antimicrobial stewardship in ICU settings.

Indian Journal of Medical Microbiology | Original research article | 14 June 2025 | Online link

High prevalence of antimicrobial resistance to initial empirical antibiotic therapy in neonatal sepsis in Bengaluru, India – a multicentre study

- Assesses sepsis incidence, causative organisms, resistance patterns and mortality in neonates across six NICUs in Bengaluru.
- Gram-negative septicaemia constituted 60% of neonatal sepsis burden, with *Klebsiella pneumoniae* as the predominant organism. Over 50% of cases received ineffective initial therapy, with higher mortality.

Journal of Tropical Pediatrics | Journal article | 19 June 2025 | Online link (abstract only)

Surveillance of multidrug-resistant genes in clinically significant gram-negative bacteria isolated from hospital wastewater

- Finds high rates of *Enterobacterales* resistant to carbapenems and cephalosporins in isolates from final treated hospital effluents from a tertiary care hospital in Mangaluru.
- Proposes microbiological surveillance of hospital wastewater to screen for early detection of resistant profiles and early warning of outbreaks and difficult to treat infections.

Antibiotics | Article | 15 June 2025 | Online link

Antimicrobial resistance in Africa: a retrospective analysis of data from 14 countries, 2016–2019

- Assesses AMR prevalence and variations in 205 labs across 14 African countries, highlighting high AMR variability across countries and pathogens, with *E. coli* and *S. aureus* showing significant resistance.
- Highlights that data gaps, limited antimicrobial susceptibility testing, and inadequate digital infrastructure hinder AMR surveillance and estimation of the true AMR burden in the region.

PLOS Medicine | Research article | 24 June 2025 | Online link

3) Infection prevention and control

Sameeksha – Infection Prevention and Control | volume 19

- Effectiveness of tissue adhesive to reduce central line-associated bloodstream infection (CLABSI)
- Simulation-based IPC training for medical and healthcare students
- Strategies to prevent aerosol-generated microbial contamination in dental procedures
- Tools and strategies to monitor hospital environmental hygiene services
- MoHFW's implementation guidebook on solid waste management in healthcare facilities

WCO India | Newsletter | June 2025 | Online link

4) Optimise use of antimicrobials

Global trends in inappropriate use of antibiotics, 2000–2021: scoping review and prevalence estimates

- Finds high prevalence of inappropriate antibiotic in all countries regardless of national income level – with one third of global antibiotic consumption potentially due to unnecessary prescriptions.
- Highlights the need for antibiotic stewardship efforts and defining standardised indicators to monitor progress in reducing inappropriate antibiotic use.

BMJ Public Health | Original research | 27 May 2025 | Online link

A systematic review of the effectiveness and cost-effectiveness of implementing antimicrobial stewardship program at tertiary care facilities in India

- Assesses the clinical and economic impact of antimicrobial stewardship programs (ASPs) in Indian tertiary healthcare facilities focusing on antibiotic use, resistance trends and healthcare costs.
- Antimicrobial stewardship programs (ASPs) reduce antibiotic use by up to 32% in Indian tertiary hospitals, improve infection control and patient safety, and save costs in resource constrained settings.

IJID Regions | Systematic review | 12 May 2025 | Online link

Improved diagnostic stewardship in carbapenem-resistant *Enterobacterales* gene detection helps in early initiation of targeted therapy

- A cross-sectional study at a Kolkata hospital shows that one-fourth of *Enterobacterales* isolates were carbapenem-resistant, mainly *Klebsiella pneumoniae*.
- PCR enabled targeted therapy could be initiated in more than 70% cases.

Journal of Medical Microbiology | Research article | 20 June 2025 | Online link

Estimating global antibiotic needs for chronic obstructive pulmonary disease and community- and hospital- acquired pneumonia in 20 countries: a modelling analysis

- Estimates antibiotic needs for COPD and pneumonia in 2019 across 20 countries, using WHO AWaRe guidelines and bacterial etiology data to simulate treatment pathways; with penicillins (76.1%) and cephalosporins (22.6%) dominating demand, with India and China having the largest need for antibiotics, followed by USA and Brazil.
- Highlights that prudent antibiotic use is essential to curb AMR and provides a framework for estimating needs and informing global planning.

International Journal of Infectious Diseases | Research article | 18 June 2025 | Online link

Length of hospital stay and associated treatment costs for patients with susceptible and antibiotic-resistant Salmonella infections: a systematic review and meta-analysis

- Shows that resistant strains of Salmonella are associated with an increased economic burden in terms of increased hospitalisation costs and length of stay.
- Patients with resistant infections had an additional 0.5-2.2 days' hospital stay and higher treatment costs, especially in low-income settings.

BMJ Open | Original research | 23 June 2025 | Online link

5) Research, innovations and finance

Antimicrobial resistance and vaccines in Enterobacteriaceae including extraintestinal pathogenic *Escherichia coli* and *Klebsiella pneumoniae*

- Explores the burden of AMR in *E. coli* and *K. pneumoniae*, highlighting vaccine development as a complementary strategy to antibiotics.
- Highlights that vaccines targeting extra-intestinal pathogenic *E. coli* and *K. pneumoniae* could reduce both resistant and susceptible infections, lower antibiotic use, and preserve current treatments.

npj Antimicrobials and Resistance | Review | 28 April 2025 | Online link

Leveraging artificial intelligence to combat antimicrobial resistance in geriatric care

- Explores the role of artificial intelligence (AI) in enhancing antimicrobial stewardship in geriatric care by enabling early detection, personalized treatment, and real-time surveillance of multidrug-resistant organisms.
- Shows that AI applications can enhance diagnostic precision, predict resistance patterns, reduce inappropriate antibiotic use, and improve medication adherence.

Digital health | Article commentary | 29 May 2025 | Online link

Molecular characterization of antimicrobial resistance in *Escherichia coli* from dairy farm environment

- Assesses AMR in *E. coli* isolates from dairy farm environments, using phenotypic susceptibility testing and molecular techniques to detect resistance genes.
- Shows a significant proportion of isolates showed multidrug resistance, particularly to ampicillin and tetracycline, indicating environmental reservoirs of resistance with potential public health implications.

International Journal of Hygiene and Environmental Health | Research article | 7 June 2025 | Online link (abstract only)

Antimicrobial peptides from earthworms: emerging candidates for novel therapeutic applications

- Reviews different earthworm antimicrobials like antimicrobial peptides (AMPs), extracts, powders and earthworm coelomic fluid (ECF) with experimental validation.
- Highlights that these earthworm antimicrobials show antibacterial, antiviral, antifungal, wound-healing, and anti-tumour effects, and can boost drug efficacy and help fight AMR.

Toxicon | Review | 9 June 2025 | Online link

6) Collaborations

Association between national action and trends in antibiotic resistance: an analysis of 73 countries from 2000 to 2023

- Analyzes national policy actions using Global Database for Tracking Antimicrobial Resistance (TrACSS) data and regression models across 73 countries to assess their impact on antibiotic resistance trends
- Shows that stronger national actions correlated with slower resistance growth, reduced antibiotic use, and better health outcomes.

PLOS Global Public Health | Research article | 30 April 2025 | Online link

Antibiotics in the global river system arising from human consumption

- Uses a global contaminant fate model to simulate how 40 most consumed antibiotics in humans enter and persist in river systems, analyzing 23.8 million km of rivers and estimating environmental exposure and risks.
- Finds that nearly 8,500 tonnes of antibiotics enter river systems annually from domestic consumption alone, and 6 million km of rivers worldwide exceed safe thresholds, especially in South-East Asia.

PNAS Nexus | Journal article | 22 April 2025 | Online link

Quotable quote

"Commit to scale up action ... on antimicrobial resistance, with the aim to reduce the global deaths associated with bacterial antimicrobial resistance by 10 per cent by 2030"

– Political Declaration on AMR
79th United Nations General Assembly
High-level Meeting on AMR, September 2024

**Sameeksha* is a Hindi word, meaning "review". Publications and resources on AMR (with a bulleted summary and online link) are compiled according to the strategic priorities of India's National Action Plan on Antimicrobial Resistance. Kindly note, inclusion of publications and resources in this review/compilation does not imply an endorsement by WHO.