

AMR Sameeksha*

Highlights

- Building awareness and action on AMR among medical students and healthcare professionals
- Socioeconomic status and risk for colonization or infection with priority bacterial pathogens
- WHO recommendations for management of serious bacterial infections in infants aged 0-59 days
- Using digital health technologies to optimise antimicrobial use globally
- Identifying WHO global priority endemic pathogens for vaccine research and development
- Policy and regulatory interventions to address antibiotic shortages in low and middle-income countries

1) Awareness and understanding

A brief report on AMR frontline workshops: building awareness and action on antimicrobial resistance among medical students and healthcare professionals

- Overview of a series of nine workshops targeting second year medical students, encompassing interactive activities and expert speakers to raise awareness of AMR and clinical situations faced by physicians.
- Evaluation of one workshop shows improvements in awareness scores, particularly in relation to AMR stewardship and multi-sectoral aspects of AMR, such as misuse of antibiotics in livestock industry.

Superheroes Against Superbugs and APSI | Brief report | September 2024 | [Online link](#)

Awareness and capacities of 103 countries to address antimicrobial resistance from 2017 to 2020

- Finds awareness of AMR lacking across countries regardless of development levels, measured by a range of metrics.
- Universal health coverage – and not the number of physicians – was the only factor associated with a country's capacity to implement National Actions Plans on AMR.

Scientific Reports | Article | 4 December 2024 | [Online link](#)

Assessment of preparedness for antimicrobial resistance in the veterinary department of a district in South India

- KAP survey of veterinarians and para-veterinarians finds differences in technical knowledge between senior and block-level veterinary officers highlighting a need to address communication and coordination gaps.
- The veterinary department showed good preparedness for AMR response especially infection control but surveillance systems need strengthening.

International Journal of One Health | Research article | 29 November 2024 | [Online link](#)

2) Laboratories and surveillance

Genetic characteristics and diversity of PDC variants of *Pseudomonas aeruginosa* and its clinical relevance

- Study of variants of Pseudomonas-derived cephalosporinases (PDC) finds the ESAC allele PDC-447 to be the most widespread among 111 isolates from India (Vellore), while PDC-3 was the most prevalent variant globally.
- Calls for greater research on geographical differences in prevalence patterns and regional surveillance of PDC and evolving resistance mechanisms.

Infections, Genetics and Evolution | Research article | 10 December 2024 | [Online link](#)

Socioeconomic status and the risk for colonisation or infection with priority bacterial pathogens: a global evidence map

- Scoping review finds poorer socioeconomic status tends to lead to higher colonization by ESKAPE and *E. coli* but the evidence base is limited.
- Recommends future research to stratify AMR data by socioeconomic status.

Lancet Microbe | Review | 6 December 2024 | [Online link](#)

Using genomics to explore the epidemiology of vancomycin resistance in a sewage system

- Uses conventional metagenomics and Hi-C technologies (emerging technique that links genes to host organisms in metagenomes) to analyse glycopeptide resistance genes in wastewater samples.
- Finds that vanHAX genes have not spread widely despite lengthy time in water.

Microbiology Spectrum | Research article | 10 December 2024 | [Online link](#)

Non-typhoidal Salmonella in humans in India, Vietnam, Bangladesh and Sri Lanka: a systematic review

- Finds high burden of non-typhoidal Salmonella (NTS) and high levels of resistance to the seven antibiotics analysed.
- Calls for a One Health approach for surveillance of NTS in Asia to ensure robust data.

JAC-Antimicrobial Resistance | Journal article | 26 November 2024 | [Online link](#)

3) Infection prevention and control

Sameeksha – Infection Prevention and Control | volume 15

- WHO global report on infection prevention and control
- WHO training package on environmental cleaning
- Quality assessment of IPC in delivery points in a tribal district of Maharashtra
- Effectiveness of health education package on hand hygiene among food handlers in a Delhi hospital
- Environmental cleaning barriers and mitigation measures
- Editable social media card to prevent infections in healthcare facilities

WCO India | Publication | 10 January 2025 | [Online link](#)

4) Optimise use of antimicrobials

WHO recommendations for management of serious bacterial infections in infants aged 0–59 days

- Guidelines for management of sepsis, meningitis and pneumonia among infants with a focus on antibiotic treatment effectiveness and diagnostic test accuracy in hospitals and communities.
- Provides 11 recommendations to guide national and subnational health policies and clinical protocols.

WHO | Guideline | 8 December 2024 | [Online link](#)

Multiple first-line therapies as part of the response to antimalarial drug resistance

- Outlines a strategy against artemisinin-resistance based on multiple first-line therapies for malaria.
- Recommends use of mathematical modelling to evaluate interventions for multiple first-line therapies.

WHO | Manual | 20 November 2024 | [Online link](#)

Antimicrobial stewardship implementation in primary and secondary tier hospitals in India: interim findings from a need assessment study using mixed method design

- Study finds high antibiotic and multiple antibiotic prescription rates for common infections in primary and secondary hospitals in West Bengal.
- Calls for empowerment of primary and secondary hospitals to practice antimicrobial stewardship to support national efforts to optimise antimicrobial use.

Scientific Reports | Article | 14 November 2024 | [Online link](#)

Adopting a model of antimicrobial stewardship program to anti-tubercular treatment stewardship: a single-centre experience from a private tertiary care hospital in South India

- Evaluates the feasibility of adapting an AMS program for tuberculosis, which encompasses mostly outpatients that require monitoring during the treatment period.
- Demonstrates that promoting rational antitubercular treatment prescriptions can be effectively achieved with an adapted AMS program.

PLoS One | Research article | 5 November 2024 | [Online link](#)

Accelerating optimal approval of priority formulations for antibiotic use in children

- Describes outcomes of meeting with WHO, researchers and industry partners to advance pediatric drug optimization.
- Review regulatory frameworks and clinical research related to pediatric formulations of antibiotics.

WHO | Meeting report | 20 November 2024 | [Online link](#)

Using digital health technologies to optimise antimicrobial use globally

- Describes state of art digital health technologies and ideal data to optimize antibiotic prescribing across clinical decision-making.
- Identifies technical and regulatory challenges for low and middle-income countries (LMICs).

Lancet Digital Health | Series on addressing AMR with digital approaches | 14 November 2024 | [Online link](#)

Advancing the management of maternal, fetal, and neonatal infection through harnessing digital health innovations

- Overview of digital health interventions across pregnancy and early life with focus on bacterial infections.
- Concludes that digital health innovations through an interdisciplinary approach can advance the management of maternal and neonatal infections and AMR, particularly in low resource settings.

Lancet Digital Health | Series on addressing AMR with digital approaches | 14 November 2024 | [Online link](#)

Innovative diagnostic technologies: navigating regulatory frameworks through advances, challenges, and future prospects

- Presents regulatory challenges of infectious disease and AMR diagnostics, with UK as an example and broader global efforts to address these issues.
- Calls for greater collaboration between innovators, regulators and industry partners.

Lancet Digital Health | Series on addressing AMR with digital approaches | 14 November 2024 | [Online link](#)

Effectiveness of work-based educational interventions for antimicrobial stewardship: a systematic review

- Reviews 46 studies to evaluate effectiveness of educational interventions for AMS among health professionals.
- Proposes education interventions rooted in theory, to target deep learning and integrate mechanisms to ensure behavioural change – which are more likely to be effective.

JAC-Antimicrobial Resistance | Journal article | 10 December 2024 | [Online link](#)

5) Research, innovations and finance

Identifying WHO global priority endemic pathogens for vaccine research and development (R&D) using multi-criteria decision analysis (MCDA): an objective of the Immunization Agenda 2030

- Uses multi-criteria decision analysis to assess prioritization of endemic pathogens for vaccine research and development integrating values of regional stakeholders.
- AMR was among the top two criteria rated and the five prioritized pathogens across regions are – *M. tuberculosis*, HIV-1, *K. pneumoniae*, *Staph. aureus* and extraintestinal pathogenic *E. coli*.

eBioMedicine | Article | 4 November 2024 | [Online link](#)

Cost-effectiveness of a short-course antibiotic treatment strategy for the treatment of ventilator-associated pneumonia: an economic analysis of the REGARD-VAP trial

- Planned economic analysis alongside an RCT assesses cost-effectiveness of short antibiotic treatment compared to standard of care among patients with ventilator associated pneumonia (VAP) in three Asian countries – Nepal, Thailand and Singapore.
- The trial shows that individualised short-course antibiotic treatment for VAP is likely to be cost effective in all income settings.

Lancet Global Health | Article | 4 November 2024 | [Online link](#)

Genomic epidemiology and genetic characteristics of clinical *Campylobacter* species cocirculating in West Bengal, India, 2019, using whole genome analysis

- Analyses genomic diversity of 112 hospital isolates of *Campylobacter* from diarrhoea patients at two hospitals in Kolkata.
- The prevalent strains vary from those in other countries, with resistance factors identified against macrolides, fluoroquinolones and tetracycline, underscoring need for pathogen genomics for surveillance, clinical decision making and disease control in India.

Antimicrobial Agents and Chemotherapy | Research article | 4 December 2024 | [Online link](#)

Microbial contamination and antibiotic resistance in fresh produce and agro-ecosystems in South Asia – a systematic review

- Highlights widespread antimicrobial resistant bacteria and antimicrobial resistance genes in fresh produce in agroecosystems across South Asia.
- Identifies the most common bacteria (*E. coli*, *Salmonella* spp., *Staphylococcus* spp., *Klebsiella* spp.) among vegetables that are consumed raw or with minimal processing, such as tomatoes, cucumbers and carrots.

Microorganisms | Review | 8 November 2024 | [Online link](#)

Effect of preconception antibiotics exposure on female reproductive health and pregnancy outcomes: a systematic review and meta-analysis

- Finds that certain antibiotics (macrolides, sulfonamides and trimethoprim) given during the preconception period, increase risk of infertility, miscarriage and congenital abnormalities.
- Calls for greater education and integrating antibiotic risk assessments into preconception care protocols to reduce adverse reproductive outcomes.

eClinicalMedicine | Article | 22 November 2024 | [Online link](#)

Phage cocktail amikacin combination as a potential therapy for bacteremia associated with carbapenemase producing colistin resistant *Klebsiella pneumoniae*

- Preclinical study investigates *K. pneumoniae*-specific phages from wastewater in Thailand.
- Identifies two promising phages-vB_kpnM_05 (myovirus) and vB_kpnP_08 (podovirus) in combination with amikacin as a potential alternative therapy for extensively drug-resistant *K. pneumoniae*.

Scientific Reports | Article | 22 November 2024 | [Online link](#)

6) Collaborations

Policy and regulatory interventions to address antibiotic shortages in low and middle-income countries

- Outlines the challenges of antibiotic shortages in LMICs and the how to strengthen national regulatory authorities to anticipate and mitigate antibiotic shortages with multi-stakeholder cooperation.
- Identifies a stepwise approach – to address antibiotic shortages – that considers foundational issues and complexities of supply chains.

WHO and GARDP | Global report | 11 December 2024 | [Online link](#)

An eco-evolutionary perspective on antimicrobial resistance in the context of One Health

- Reviews how biological organization impacts AMR with an emphasis on horizontal gene transfer.
- Calls for a systems perspective that accounts for genetic and ecological interactions that impact AMR.

iScience | Perspective | 5 December 2024 | [Online link](#)

World Health Organization African Region national heads of units of diagnostics and laboratory services meetings proceedings

- Workshop enables laboratory leaders to network and share best practices in WHO African region.
- Identifies the roles of laboratories in AMR surveillance and need for capacity-building in managing AMR.

BMC Proceedings | Meeting report | 28 November 2024 | [Online link](#)

Setting targets for antibiotic use in general practice in Europe: a scoping review

- Maps antibiotic use in general practice in relation to national action plans (NAP) across 31 European countries.
- Finds that most European countries have a NAP with established targets but inadequate translation of targets into daily clinical practice, which requires greater inclusion of prescribers in the NAP process.

European Journal of General Practice | Review article | 28 November 2024 | [Online link](#)

Quotable quote

“The success of Nafithromycin is a testament to India’s growing capability to develop homegrown solutions for pressing healthcare challenges”

– Dr Jitendra Singh, Union minister of Science and Technology, and Earth Sciences during soft launch of India’s first indigenous antibiotic

**Sameeksha* is a Hindi word, meaning review. This is a compilation of open access publications and resources on One Health containment of AMR (along with a brief summary) – grouped 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.