

*Sameeksha** – Antimicrobial Resistance (AMR)

Key highlights

- WHO List of Medically Important Antimicrobials
- GLASS dashboard presents visualization of AMR and AMU data up to 2021
- Global AMR campaigns improve public awareness and antimicrobial use
- Infection Prevention and Control *Sameeksha*
- AWaRe-based culture reporting for antimicrobial stewardship
- Tracking the decline of AMR R&D professionals
- Implementation guide for the One Health Joint Plan of Action

Strategic priority 1: Awareness and understanding

Assessment of global antimicrobial resistance campaigns conducted to improve public awareness and antimicrobial use behaviours: a rapid systematic review

- Global AMR campaigns for the public improve awareness when they use mass media, target the messages for specific infections (especially respiratory infections) and include patient interactions with healthcare workers.
- Proposes evaluating the effectiveness of future campaigns, including use of social media channels.

BMC Public Health | Research article | 6 February 2024 | [Online link](#)

Superbugs online: co-production of an educational website to increase public understanding of the microbial world in, on, and around us

- Details the process of development and impact evaluations of an online resource on infection, hygiene and AMR for schools in the United Kingdom and Ireland.
- Includes information, quizzes, animations, videos, illustrated stories, interactive timelines, games, and protocols for home experiments, and English content on www.superbugs.online is accessed by users from across the world, including India.

Frontiers in Microbiology | Original research article | 6 February 2024 | [Online link](#)

Knowledge, attitudes, and practices regarding antibiotic use in Bangladesh: findings from a cross-sectional study

- Shows that majority of respondents have proper knowledge about antibiotics (73%), positive attitudes (93%) and practices (58%), with a positive linkage with higher education background.
- Proposes a course on rational antibiotic use that focuses on people's practices toward antibiotic use.

PLoS One | Research article | 12 February 2024 | [Online link](#)

Strategic priority 2: Laboratories and surveillance

GLASS dashboard

- Complements GLASS reports with visualization of AMR and AMU data (up to 2021) by country and year.
- Includes resistance rates for 23 antibiotics across 8 bacterial pathogens and 11 antimicrobial classes.

WHO | Dashboard | 13 February 2024 | [Online link](#)

Surveillance data of the Indian Network for Fishery and Animal Antimicrobial Resistance (INFAAR)

- Presents AMR data from 21 sites of Indian Network for Fishery and Animal Antimicrobial Resistance (INFAAR).
- Among food animals, poultry showed highest resistance rates to all tested antibiotics.

FAO | Analytical report | 2024 | [Online link](#)

Enhanced Gonococcal Antimicrobial Surveillance Programme (EGASP): surveillance report 2022 and supplementary protocols

- EGASP surveillance aims to provide quality gonococcal AMR data which is comparable across countries.
- Supplementary protocols are provided for treatment failure, extragenital sampling and whole genome sequencing framework.

WHO | Technical documents | 7 February 2024 / 24 January 2024 | [Online link](#) | [Supplementary protocols](#)

Risk assessment: emergence of hypervirulent *Klebsiella pneumoniae* ST23 carrying carbapenemase genes in EU/EEA countries – first update

- Clusters of hospital-associated infections due to multi-drug resistant hypervirulent *Klebsiella pneumoniae* (hvKp) sequence type (ST) 23 have increased across European countries.
- Previously, hvKp ST-23 was primarily found in Asia where transmission was largely community-acquired with minimal resistance to antibiotics.

ECDC | Risk assessment | 14 February 2024 | [Online link](#)

Child deaths caused by *Klebsiella pneumoniae* in sub-Saharan Africa and south Asia: a secondary analysis of Child Health and Mortality Prevention Surveillance (CHAMPS) data

- Robust data from 7 countries shows that *K. pneumoniae* contributed substantially to death in first two years of life and showed resistance to commonly used antibiotics.
- Calls for adaptation of empirical treatment guidelines, IPC and stewardship interventions to curb resistant *K. pneumoniae* strains.

Lancet Microbe | Article | 10 January 2024 | [Online link](#)

Workshop on strengthening laboratory services for antimicrobial resistance (AMR) surveillance in leprosy

- Provides an overview of latest evidence and testing procedures for AMR surveillance in leprosy.
- Recommendations include developing capacity for AMR surveillance in leprosy, integration in national action plans on AMR, reporting to GLASS, and improving clinical management of patients with resistant leprosy.

WHO | Report | 8 February 2024 | [Online link](#)

Strategic priority 3: Infection prevention and control

Sameeksha – Infection Prevention and Control | volume 7

- WHO assessment tools on IPC minimum requirements for tertiary and secondary health care facilities
- Access to PPE for HCWs during outbreaks avert infections and deaths among HCWs
- Effective healthcare communication in hospitals to optimizing IPC and antimicrobial stewardship
- Nurses' preferences for interventions to improve infection prevention and control
- Online course for training the trainers in environmental cleaning of health care facilities
- Prevention and control of microbiological hazards in fresh fruits and vegetables

WCO India | Publication | 12 February 2024 | [Online link](#)

Strategic priority 4: Optimise use of antimicrobials

WHO List of Medically Important Antimicrobials: a risk management tool for mitigating antimicrobial resistance due to non-human use

- An update on the 2018 WHO list of Critically Important Antimicrobials, it complements the WHO AWaRe framework with a list of 21 antimicrobials for optimizing use in human and animal sectors, to minimize the risk of development and transfer of resistant bacteria to humans.
- Targets national regulators, policymakers, national AMR steering committees, human and animal health professionals and food producers.

WHO | Report | 8 February 2024 | [Online link](#)

AWaRe-based culture reporting format: a novel tool for antimicrobial stewardship

- Details an AWaRe-based bacterial culture susceptibility reporting format conceptualized and piloted by Government Medical College Thiruvananthapuram, Kerala.
- Aims to improve physician understanding of WHO's AWaRe system and enhance antimicrobial prescription knowledge, attitude and practices through continuous reinforcement.

GMS Infectious Diseases | Letter to the editor | 14 November 2023 | [Online link](#)

Patterns of antibiotic use for acute respiratory infections in under-three-year-old children in India: a cross-sectional study

- Analysis of National Family Health Surveys (NFHS) data reports that 18.7% of children under 3 years with acute respiratory infection symptoms were given an antibiotic.
- Children with greater access to health care and mothers with secondary or higher education were more likely to receive an antibiotic.

Journal of Global Health | Article | 22 December 2023 | [Online link](#)

Antibiotic stewardship in Indian palliative care: a single-center retrospective study

- Assesses outcomes of using an antibiotic order form as a stewardship intervention in a palliative care centre in Kerala.
- Finds that younger patients were more likely to receive antibiotics and physicians did not consistently follow guidelines in completing forms.

Antimicrobial Stewardship & Healthcare Epidemiology | Original article | 8 November 2023 | [Online link](#)

Ten-year trends of antibiotic prescribing in surgery departments of two private sector hospitals in Central India: a prospective observational study

- Study finds a decline in antibiotic prescriptions but increase in the consumption of “Watch” antibiotics – notably norfloxacin and ceftriaxone.
- Suggests developing perioperative antibiotic prophylaxis guidelines and implementing antimicrobial stewardship programs.

BMC Public Health | Research article | 27 January 2024 | [Online link](#)

Clinical utility of procalcitonin in implementation of procalcitonin-guided antibiotic stewardship in the South-East Asia and India: evidence and consensus-based recommendations

- Examines role of procalcitonin (PCT), a biomarker used in diagnosing bacterial infections, for AMS.
- Supports the use of PCT in antimicrobial stewardship in lower respiratory tract infections, sepsis, and COVID-19 but more research is needed for other conditions.

Expert Review of Anti-infective Therapy | Review article | 20 December 2023 | [Online link](#)

Sepsis stewardship: the puzzle of antibiotic therapy in the context of individualization of decision making

- Reviews challenges, theories, and strategies to effectively treat sepsis in the context of multidrug resistance.
- Discusses the role of new antibiotics in addressing sepsis and septic shock.

Journal of Personalized Medicine | Review article | 18 January 2024 | [Online link](#)

Challenges of implementing antimicrobial stewardship tools in Low to Middle Income Countries (LMICs)

- Suggests antimicrobial stewardship programs should be adapted to the context and challenges in low and middle-income countries (LMICs).
- Provides a list of Open Access antimicrobial stewardship tools relevant for LMICs.

Infection Prevention in Practice | Letter to editor | 7 December 2023 | [Online link](#)

Strategic priority 5: Research, innovations and finance

Leaving the lab: tracking the decline in AMR R&D professionals

- Documents the decline of AMR researchers, publications, and patents despite the growing global AMR threat.
- Recommends rebuilding a robust AMR workforce through adequate funding, supporting early career researchers, and developing new initiatives.

AMR Industry Alliance | Report | 8 February 2024 | [Online link](#)

Diagnostic validation study of rapid urinary tract infection diagnosis kit at peripheral health facilities of West Bengal, India

- Reports high specificity and sensitivity of an Indian point-of-care rapid diagnostic test for UTI (Rapidogram) compared with conventional culture and sensitivity.
- Currently it identifies only Gram-negative bacteria and their antibiotic sensitivity pattern.

Scientific Reports | Article | 2 January 2024 | [Online link](#)

Whole genome sequence-based molecular characterization of blood isolates of carbapenem-resistant *Enterobacter cloacae* complex from ICU patients in Kolkata, India, during 2017–2022: emergence of phylogenetically heterogeneous *Enterobacter hormaechei* subsp. *xiangfangensis*

- Detects high diversity of *E. cloacae* complex (CR-ECC) and emerging genes not routinely monitored for AMR.
- Recommends need for strengthened molecular epidemiology surveillance of CR-ECC as an important nosocomial pathogen.

Clinical Microbiology | Research article | 22 February 2024 | [Online link](#)

Recent advances in the development of antibiotics-coated gold nanoparticles to combat antimicrobial resistance

- Reviews the use and strategies of developing gold nanoparticles (AuNPs) which are known to have low toxicity and enhanced antimicrobial properties.
- Suggests further research on AuNPs focusing on mechanistic properties, large-scale preparation, cost-effectiveness, and safety.

Antibiotics | Review article | 26 January 2024 | [Online link](#)

An insight into genes responsible for fosfomycin resistance among uropathogens of asymptomatic bacteriuria during pregnancy: a North Indian study

- Study finds 11% of pregnant women with asymptomatic bacteriuria wherein *murA* and *glpT* genes were more frequent than *fosA*.
- Overall low resistance to fosfomycin was seen in this study at an Aligarh hospital – recommending reserving its use for multi-drug resistant infections.

Access Microbiology | Research article | 11 December 2023 | [Online link](#)

The burden of bacterial antimicrobial resistance in the WHO African region in 2019: a cross-country systematic analysis

- In 2019, 1 million deaths were associated with, and 250,000 deaths attributed to bacterial AMR in Africa.
- Pathogens with more than 100,000 deaths each included *S. pneumoniae*, *K. pneumoniae*, *E. coli* and *S. aureus*.

Lancet Global Health | Article | 19 December 2023 | [Online link](#)

Gut microbiome predictors of *Escherichia coli* sequence type 131 colonization and loss

- Investigates association of gut microbiome with *E. coli* sequence type 131 and its fluoroquinolone-resistant H30R subclone lineage (ST131-H30R) carriage.
- Pathways may indicate targets to reduce or prevent ST131-H30R – a global, multi-resistant pathogen.

eBioMedicine | Article | 12 December 2023 | [Online link](#)

Strategic priority 6: Collaborations

A guide to implementing the One Health Joint Plan of Action at national level

- Outlines practical guidance for countries to implement the One Health Joint Plan of Action.
- Targeted at One Health stakeholders, it includes resources and tools to support One Health.

WHO | Guideline | 6 December 2023 | [Online link](#)

Regional Tripartite AMR Project News

- Provides project updates for the Regional Tripartite AMR project funded by the European Union.
- Summarizes regional and country activities (including India) from January to December 2023.

FAO | Project news | February 2024 | [Online link](#)

Report of the inaugural meeting of the Quadripartite working group on youth engagement for AMR

- The working group on youth engagement for AMR aims to provide a platform for young individuals to contribute towards AMR containment globally.
- Presents the expected functions and workplan of the working group.

WHO | Meeting report | 21 December 2023 | [Online link](#)

Antimicrobial resistance and the great divide: inequity in priorities and agendas between the Global North and the Global South threatens global mitigation of antimicrobial resistance

- Argues that a Global North-centric bias of addressing AMR via investments in research and development of new antibiotics diverts required resources for infection prevention control efforts in the Global South.
- Calls for recalibration of priority interventions for AMR mitigation in the long-term.

Lancet Global Health | Viewpoint | 23 January 2024 | [Online link](#)

The 2023 AMR Industry Alliance progress survey: tackling antimicrobial resistance through contributions to research and science, access and appropriate use

- Report of AMRIA's progress towards AMR containment through activities focused on research and science, access and appropriate use.
- Finds significant investments in AMR R&D, collaborative antimicrobial stewardship activities and data sharing.

AMR Industry Alliance | Report | 2 January 2024 | [Online link](#)

The 2023 AMR Industry Alliance progress survey: manufacturing and the environment

- Reviews AMRIA's progress in responsible antibiotic manufacturing by reducing antibiotic emissions and promoting adherence to the Common Antibiotic Manufacturing Framework (CAMF).

AMR Industry Alliance | Report | 13 December 2023 | [Online link](#)

Quotable quote

*... It is an urgent appeal to all doctors in medical colleges
to mandatorily mention exact indication / reason / justification
while prescribing antimicrobials ...*

– Letter from Prof (Dr) Atul Goel
Director General of Health Services

**Sameeksha* is a Hindi word, meaning review. This is a compilation of high-level, 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.