

Sameeksha* – Antimicrobial Resistance (AMR)

Key highlights

- Designing community-based interventions to tackle AMR through behaviour change interventions
- Special series on using genomics for AMR surveillance
- Ten golden rules for optimal antibiotic use in hospital settings
- Treatment alternatives for MDR Gram negative *P. aeruginosa*
- Inventory of One Health tools to guide national action plans

Strategic priority 1: Awareness and understanding

Co-designing community-based interventions to tackle antimicrobial resistance (AMR): what to include and why

- Describes seven key concepts to guide behavioural drivers of AMR interventions derived from experiences of the Community Engagement for AMR (CE4AMR) network, which operates largely in South-East Asia.

BMC Research Notes | Comment | 24 October 2023 | [Online link](#)

Existing terminology related to antimicrobial resistance fails to evoke risk perceptions and be remembered

- Surveys of public awareness about AMR terminology in UK and USA find that 'AMR' and 'antimicrobial resistance' score poorly on memorability and risk association.

Communications Medicine | Research article | 25 October 2023 | [Online link](#)

Public knowledge, attitudes, and practices regarding antibiotics use and antimicrobial resistance in Bangladesh

- Cross-sectional survey reveals knowledge gaps regarding antibiotics use for viral infections, misdirected practice of seeking out multiple doctors for an antibiotic prescription and need for public education.

Heliyon | Research article | 19 October 2023 | [Online link](#)

Strategic priority 2: Laboratories and surveillance

Evidence review and recommendations for the implementation of genomics for antimicrobial resistance surveillance: reports from an international expert group

- First in a series of five papers – with nine recommendations to achieve the potential of genomics for AMR surveillance.

Lancet Microbe | Research article | 14 November 2023 | [Online link](#)

Catalogue of mutations in *Mycobacterium tuberculosis* complex and their association with drug resistance, 2nd ed

- Updated reference standard for interpreting mutations and their associated phenotypic resistance to 13 anti-TB medicines.
- Can be used to interpret genome sequencing results and guide new molecular drug susceptibility tests.

WHO | Guideline | 15 November 2023 | [Online link](#)

A worldwide population of *Streptococcus pyogenes* strains circulating among school-aged children in Auckland, New Zealand: a genomic epidemiology analysis

- Study finds diverse population of group A *Streptococcus* strains resembling patterns found in low- and middle-income as well as high income countries creating challenges for vaccine development and disease management.

Lancet Regional Health Western Pacific | Research article | 13 November 2023 | [Online link](#)

Genomics for public health and international surveillance of antimicrobial resistance

- This is third in a series of five papers on using genomics for AMR surveillance.
- Identifies two main reasons for integrating genomics into global public health surveillance – detecting new and emerging threats and guiding appropriate public health responses.

Lancet Microbe | Research article | 14 November 2023 | [Online link](#)

Association of health, nutrition, and socioeconomic variables with global antimicrobial resistance: a modelling study

- Predictive models of antimicrobial use data explain limited variation in the global abundance of AMR genes.
- Metagenomic analysis of sewage demonstrates need for country-specific AMR interventions adapted to locally relevant socioeconomic variables and class of antibiotics.

Lancet Planetary Health | Research article | November 2023 | [Online link](#)

Exploiting genomics for antimicrobial resistance surveillance at One Health interfaces

- This is fourth in a series of five papers on using genomics for AMR surveillance.
- Has three key recommendations – define a framework for use, address funding models and evaluate cost-effectiveness, and leverage existing One Health genomic surveillance activities and integrate environmental AMR surveillance.

Lancet Microbe | Research article | 14 November 2023 | [Online link](#)

Strategic priority 3: Infection prevention and control

Sameeksha – Infection Prevention and Control | volume 5

- Gender-sensitive interventions needed for improving hand hygiene among physicians
- Commentary on the forthcoming WHO and UNICEF guidelines on hand hygiene in community settings
- Sixth version of WHO's updated IPC living guidelines for COVID-19
- Lessons from Japan on building an effective IPC system
- WHO training package on sanitation and hygiene in the health sector
- OpenWHO course for WASH and prevention of neglected tropical diseases

WCO India | Publication | 30 November 2023 | [Online link](#)

Strategic priority 4: Optimise use of antimicrobials

Ten golden rules for optimal antibiotic use in hospital settings: the WARNING call to action

- Network of global experts develop ten concise axioms for appropriate antibiotic use in clinical settings.
- Includes graphics that convey salient messages to facilitate appropriate use of antibiotics.

World Journal of Emergency Surgery | Research article | 16 October 2023 | [Online link](#)

Coverage gaps in empiric antibiotic regimens used to treat serious bacterial infections in neonates and children in Southeast Asia and the Pacific

- Study based on weighted incidence syndromic combination antibiogram (WISCA) demonstrates high level of resistance among commonly prescribed antibiotics for sepsis and meningitis.
- Recommends identifying alternative treatments targeted to local resistance and pathogen patterns.

Lancet Regional Health Southeast Asia | Research article | 30 October 2023 | [Online link](#)

Antibiotic consumption for sore throat and the potential effect of a vaccine against group A *Streptococcus*: a systematic review and modelling study

- Study finds that vaccination to prevent Strep A sore throat will significantly reduce improper antibiotic use.
- Calls for community surveys from LMICs to estimate global consumption of antibiotics due to sore throat.

eBioMedicine | Research article | 9 November 2023 | [Online link](#)

Review of antibiotic use and resistance in food animal production in WHO South-East Asia region

- Presents data on antibiotic use (AMU) and AMR prevalence in livestock and aquaculture sectors across ten South-East Asian countries.
- Highlights need for a harmonized One Health regional framework for regulating AMU in food production.

Journal of Infection and Public Health | Research article | 21 November 2023 | [Online link](#)

Exploring the use of cluster analysis to assess antibiotic stewardship in critically-ill neonates in a low resource setting

- Retrospective cohort study of newborn sepsis in Ethiopia to identify patients requiring advanced antibiotics.
- Cluster analysis is proposed as a useful approach to support antimicrobial stewardship.

Antimicrobial Resistance & Infection Control | Research article | 31 October 2023 | [Online link](#)

Evaluating the contribution of antimicrobial use in farmed animals to global antimicrobial resistance in humans

- Spatial analysis demonstrates links between antibiotic use in animals and AMR in humans in relation to *E. coli* and *S. aureus*.
- Indicates AMR in humans is driven by antibiotic use in animals, highlighting the need for coordinated One Health strategies.

One Health | Research article | 3 November 2023 | [Online link](#)

Strategic priority 5: Research, innovations and finance

Transcending the challenge of evolving resistance mechanisms in *Pseudomonas aeruginosa* through β -lactam-enhancer-mechanism-based cefepime/zidebactam

- Finds β -lactam enhancer mechanism as a promising alternative to the conventional β -lactam/ β -lactamase inhibitor approach in treating MDR *Pseudomonas aeruginosa*.

mBio | Research article | 27 October 2023 | [Online link](#)

Clinically relevant antibiotic resistance genes are linked to a limited set of taxa within gut microbiome worldwide

- Investigates the potential global threat of AMR genes in human microbiomes being transferred to pathogens.
- Findings from 33 countries (including India) indicate nosocomial transmission is concerning, which needs additional studies and surveillance of AMR strains within the human microbiome.

Nature Communications | Research article | 14 November 2023 | [Online link](#)

Innovations in genomic antimicrobial resistance surveillance

- This is the fifth in a series of five papers on using genomics for AMR surveillance.
- Identifies four underutilized innovations in genomic AMR surveillance – clinical metagenomics, environmental metagenomics, gene/plasmid tracking and machine learning.

Lancet Microbe | Research article | 14 November 2023 | [Online link](#)

Case of carbapenem-resistant *Salmonella* Typhi infection, Pakistan, 2022

- Describes a case of enteric fever positive for NDM-5 gene that needed a combination of intravenous meropenem and colistin for treatment.

Emerging Infectious Diseases | Research letter | November 2023 | [Online link](#)

Prevalence and antimicrobial resistance profile of *Salmonella* isolated from human, animal and environment samples in South Asia: a 10-year meta-analysis

- Pooled prevalence of AMR *Salmonella* was 14.5% for South Asia, with the lowest prevalence in India (3%).
- The increase in AMR *Salmonella* over time in the region signals need for rigorous AMR containment strategies including antimicrobial stewardship.

Journal of Epidemiology and Global Health | Research article | 26 October 2023 | [Online link](#)

Strategies to combat Gram-negative bacterial resistance to conventional antibacterial drugs: a review

- Reviews the mechanisms of resistance and alternative treatments for Gram negative bacteria.

Osong Public Health and Research Perspectives | Review article | 18 October 2023 | [Online link](#)

The microbiology and pathogenesis of nonfermenting Gram-negative infections

- Reviews AMR and virulence factors in key non-fermenting Gram-negative bacteria – *P. aeruginosa*, *A. baumannii*, *S. maltophilia* and *B. cepacia* complex.
- Calls for development of novel antimicrobials and alternative strategies based on key virulence factors.

Current Opinion in Infectious Diseases | Review article | Date of publication | [Online link](#)

Strategic priority 6: Collaborations

OHHLEP inventory of One Health tools and resources

- Describes over 50 validated One Health tools and resources to guide national One Health action plans.

WHO | Technical document | 15 November 2023 | [Online link](#)

Potential role of civil society organizations (CSOs) in antimicrobial resistance (AMR) mitigation efforts in low- and middle-income countries: a report from India

- Presents roles and perspectives of CSOs in implementation of national and sub-national action plans for AMR.
- Governments in LMICs could leverage CSO expertise for AMR containment, by ensuring alignment of sustainable interventions with national priorities.

Journal of Infection and Public Health | Publication type | 21 November 2023 | [Online link](#)

Response to antimicrobial resistance in South-East Asia Region

- Reviews progress in implementing national action plans on AMR and identifies key challenges in the Region.
- Recommends making AMR interventions more effective and comprehensive by putting people and their needs at the centre of the AMR response.

Lancet Regional Health Southeast Asia | Review article | 29 October 2023 | [Online link](#)

Systems thinking based approaches to engage with health inequities shaping antimicrobial resistance in low and lower-middle-income countries

- Details a conceptual framework for addressing AMR in LMICs, drawing on systems thinking.
- Identifies four sub-systems – prescribing antibiotics, diagnostics, surveillance data and AMR literacy.

Journal of Infection and Public Health | Conceptual framework | 21 November 2023 | [Online link](#)

Quotable quote

Implement and prioritise tackling Antimicrobial Resistance (AMR) following the One Health approach, including through research and development, infection prevention and control, as well as antimicrobial stewardship efforts within respective national action plans ...

– G20 New Delhi Leaders' Declaration
9–10 September 2023

**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.