EDITORIAL

From Antimicrobial Consumption to Stewardship: Insights from the World Health Organization Access, Watch, Reserve Classification in Tertiary Care Hospitals

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Antibiotics are among the most transformative discoveries in medicine, which have significantly decreased the fatality rate from bacterial infections. However, in recent decades, rampant consumption of antibiotics and the rise of antimicrobial resistance (AMR) have driven formerly manageable infections into significant health concerns. A previous study on the global burden of AMR predicted an estimated 1.91 million deaths attributable to AMR and 8.22 million deaths associated with AMR for the year 2050.[1] AMR has been associated with approximately US$693 billion in median hospital costs globally.[2] The persistent, unrestrained use of antibiotics can transition AMR into a public health crisis, where common infections could become life-threatening. The Global Antibiotic Resistance and Use Surveillance System (GLASS) report 2025 from the World Health Organization (WHO) recognizes the growing AMR threat to global health.[3] The burden of AMR is acute in low- and middle-income countries (LMICs), which contribute to 90% of total global deaths.[4] Surveillance data from India have revealed alarming trends of rising rates of multidrug-resistant (MDR) infections, which often result in increased treatment failure rates. One of the most prominent drivers of increasing AMR is the overprescription of broad-spectrum antibiotics such as cephalosporins, fluoroquinolones, and carbapenems.

Curbing AMR in India remains a massive challenge despite critical efforts by government frameworks like the Antimicrobial Resistance Surveillance and Research Network (AMRSN). Such policies track AMR trends in hospitals to subsequently update and implement health policies.[5] The incidence of AMR in Indian healthcare settings is intensified due to a lack of adherence to standard treatment guidelines, an overburdened healthcare workforce, and delayed diagnosis of infections, leading to the prescription of empirical antibiotics.[6] There is also a dearth of new antibiotic development to address MDR pathogens, thereby compounding the crisis of resistance. The unsystematic and empirical use of existing drugs is overpowering their efficacy at a pace that exceeds the rate of novel drug discovery. This necessitates implementing rational drug use of the available antimicrobials.

In the article "Antimicrobial Consumption according to the WHO AWaRe Classification among the Admitted Patients at Tertiary Care Teaching Hospital," the authors have provided insights into antimicrobial consumption according to the WHO AWaRe (Access, Watch, Reserve) guidelines at a tertiary care teaching hospital in India.[7] Whereas the WHO recommends that at least 60% of total antibiotic consumption be from the Access group, the study found that only 24% of prescriptions adhered to this limit. While antibiotics in the Watch group were advised in 70% of cases, antibiotics in the Reserve group were advised in 6% of cases, highlighting a deviation from the AWaRe guideline of ≤5% of total consumption. In the study, after reviewing antibiotic prescriptions for 572 inpatients, a heavy reliance on broad-spectrum antibiotics, such as ceftriaxone, was observed. The overdependence on broad-spectrum agents carries severe implications of microbial imbalance in the gastrointestinal tract, yielding opportunistic infections and increased medical costs, in addition to fueling drug resistance. Although rational antibiotic prescribing was observed in the majority of cases, 32% of irrational recommendations were largely due to a lack of medical evidence, overlapping therapies, the complexity of cases in tertiary care, and delayed culture-based diagnostics and antimicrobial susceptibility testing. As 32% of the prescribed antibiotics were irrational, this is a substantial proportion and signals a level of antimicrobial misuse that cannot be ignored. The leading cause of irrational prescribing was the lack of a clear indication, followed by therapeutic duplication and failure to send culture and sensitivity samples. These findings are especially relevant because they point to modifiable weaknesses in clinical practice rather than unavoidable clinical complexity.

Prescribing an antibiotic without a clear indication reflects uncertainty, diagnostic delay, or excessive reliance on habit-based treatment rather than evidence-based decision-making. Therapeutic duplication, where two antibiotics with overlapping spectra are prescribed together without proper justification, adds another layer of concern. Such duplication not only increases the risk of adverse drug reactions and drug interactions but also inflates treatment costs and contributes little or nothing to therapeutic benefit. The omission of culture and sensitivity testing is perhaps the most troubling issue from a stewardship perspective.

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Without microbiological guidance, antibiotic use remains largely empirical, and opportunities for de-escalation or targeted therapy are lost. Hospitals that treat complex patients must also become hospitals that prescribe wisely. The future effectiveness of antibiotics depends not only on the discovery of new drugs but also on the discipline with which existing ones are used today.

In addition to the robust implementation of antimicrobial surveillance programs, health care and community awareness are paramount to combat these systemic gaps. Clinicians often resort to the Watch group of antibiotics to mitigate the onset and progression of severe infections while awaiting pathogen diagnostic results. This underscores the need for the development and availability of rapid diagnostic tests. There is a need to foster a "culture of cultures" in which the identification of bacterial pathogens and their antimicrobial susceptibility testing guide the initiation of appropriate antibiotics. In addition to the traditional phenotypic methods of pathogen identification, microscopy and staining, culture and colony morphology, and serological testing, rapid molecular methods like 16S rDNA gene sequencing, quantitative polymerase chain reaction (qPCR), and whole-genome sequencing can provide improved sensitivity and specificity.[8] An improvement in rapid diagnostics can substantially reduce the prescription of empirical drug therapies and enable early de-escalation from Watch group to Access-group antibiotics.

Regular training for clinicians, starting from the undergraduate (Bachelor of Medicine, Bachelor of Surgery) level, is necessary to mitigate AMR, minimize adverse events such as infections caused by opportunistic bacteria, and ensure optimal patient outcomes. Optimization strategies for drug prescriptions must be coherent with the core elements of antibiotic stewardship and include choosing the right narrow-spectrum, pathogen-directed drug where feasible, tailoring the right dose, routinely reviewing antibiotic regimens for appropriate de-escalation, and prescribing for the shortest effective duration where feasible.[9] Aided by rapid diagnostic results, antibiotic stewardship will address the overestimation of infection severity and encourage conservative prescribing, starting with Access group antibiotics. Medical facilities should also consider pharmacy restrictions for certain high-risk Watch and Reserve group antibiotics without prescriptions. Within healthcare facilities with improved infrastructure, integrating the AWaRe-based guidelines into electronic prescribing systems can provide real-time decision support. Regular prescription audits will provide feedback to clinicians and pharmacists, enabling the identification of opportunities for improvement and ensuring adherence to institutional policies.

Beyond the clinical ecosystem, there is an increasing need to foster research and development for new antibiotics or scour historical repositories to repurpose known drug mechanisms. According to a recent WHO report, among the 32 antibiotics currently under development to address infections caused by the bacterial priority pathogens list, only four are active against at least one of the WHO critical bacteria.[10] It is noteworthy that there is also a paucity of drugs, especially for children, and convenient oral formulations for outpatients. National action plans and institutional antimicrobial stewardship committees must provide a framework to promote responsible antibiotic use. For instance, the National Action Plan for AMR in India earmarks six priorities, including improved awareness and understanding of AMR, strengthening evidence through surveillance, reduction in the incidence of infection through infection prevention and control, optimized use of antibiotics in health, food, and animals, promoting investments for AMR activities, and strengthening leadership in AMR. Furthermore, prior to the remediation of bacterial infections, infection control practices remain the first line of defense, wherein preventing the spread of infectious strains limits the overall need for antibiotic interventions. Robust infection prevention and control (IPC) strategies are the most cost-effective means to address rising AMR. Improved hygiene in health care facilities prevents the occurrence and spread of hospital-acquired infections. In conclusion, prevention of infection, clinical education, community awareness, and diagnostic stewardship are central to safeguarding public health and sustaining the available antibiotic arsenal.

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