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EDITORIAL

Antimicrobial Stewardship in Pakistan: Challenges and solutions

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Antimicrobial resistance (AMR) is a major public health threat globally, and it presents as an accelerating crisis for Pakistan. As multi-drug-resistant infections rise across both community and healthcare settings, antimicrobial stewardship (AMS) has become a national imperative. Yet, despite increasing awareness, Pakistan continues to face significant structural, behavioural, and regulatory barriers that hinder effective implementation of stewardship programmes. Addressing these challenges will require coordinated action across public health, clinical medicine, and policy domains.[1]

Unregulated access to antibiotics is one of the most persistent challenges. Over-the-counter sales, self-medication, and the use of broad-spectrum agents for minor ailments remain commonplace, which drives misuse and gives rise to resistance. Owing to this excessive antibiotic use, Pakistan ranks 3rd amongst low-middle-income countries (LMICs) in antimicrobial consumption.[2] Furthermore, in many public and private hospitals, microbiology laboratories are under-resourced, lacking timely culture facilities and standardized susceptibility testing. Clinicians often prescribe empirically even when diagnostic guidance may be available either due to long turnaround times, lack of trust in laboratory capacity or perceived cost. There is under-reporting of resistance patterns from LMICs and although Pakistan participates in the World Health Organization Global Antimicrobial Resistance Surveillance System (GLASS), data collection remains fragmented. As a result, clinicians lack accessible, updated antibiograms to inform therapy, leading to inappropriate empiric use of broad-spectrum antibiotics. There are large gaps in antimicrobial stewardship programs and inconsistencies in implementation. While a few tertiary hospitals, particularly in major cities, have begun implementing AMS activities, these programs are not uniformly established or supported. Many facilities lack infectious disease specialists, trained pharmacists, or structured stewardship committees. High patient expectations, pressure to receive "quick fixes", limited consultation times, and cost constraints all contribute to inappropriate prescribing. In rural areas, traditional healers and unlicensed practitioners frequently provide antibiotics without adequate training. Household studies show leftover antibiotic use and inappropriate storage as additional contributors. Another important and overlooked aspect of stewardship is the non-therapeutic antibiotic use in poultry and livestock which contributes substantially to resistance. Regulatory oversight is limited, and farmers often rely on antibiotics as growth promoters.[3]

Despite formidable obstacles, there are several solutions that can strengthen antimicrobial stewardship (AMS) in Pakistan through focused, actionable interventions. First, enforcing prescription-only antibiotic policies with tighter pharmacy regulation, routine inspections, and public awareness campaigns to curb over-the-counter misuse. Second, augmenting microbiology laboratory networks by investing in infrastructure, subsidizing culture testing, standardizing protocols, and linking smaller hospitals to regional hubs will enable more data-driven therapeutic decisions. Third, establishing robust stewardship programmes in all secondary and tertiary hospitals by forming multidisciplinary committees, conducting prospective audits and feedback, restricting high-risk antibiotics, and promoting guideline-based prescribing is essential. Fourth, creating national and regional antibiograms via a centralized digital surveillance system that integrates public and private labs will equip clinicians with local resistance patterns and inform national guidelines. Fifth, regulating antibiotic use in agriculture by phasing out growth-promoting antibiotics, enhancing livestock biosecurity, and routinely inspecting veterinary pharmacies addresses a key driver of resistance. Sixth, implementing education and behaviour-change strategies for healthcare professionals through ongoing

training and for the community via schools, media and religious institutions. These can shift prescribing and consumption norms. Finally, leveraging telemedicine and digital health tools such as decision-support systems, remote infectious disease consultation, and prescription alerts can standardize care and extend stewardship into underserved regions. Combined, these targeted solutions present a realistic and comprehensive framework for sustainable AMS in Pakistan.

Pakistan stands at a critical juncture in its battle against AMR. The challenges are substantial but they are not insurmountable. By implementing antimicrobial stewardship programmes, supported by regulation, education, diagnostics, and surveillance, Pakistan can shift the trajectory toward safer and more effective antimicrobial use and be able to combat the threat of resistance.

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