

ANTIMICROBIAL RESISTANCE: A GLOBAL HEALTH THREAT AND STRATEGIES FOR PREVENTION

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Abstract. Antimicrobial resistance (AMR) has emerged as one of the most significant public health threats of the 21st century. The misuse and overuse of antibiotics, combined with the lack of new antimicrobial agents, has accelerated the evolution of resistant pathogens. This article explores the global burden of AMR, outlines contributing factors, and examines current and emerging strategies for prevention.

Keywords. Antimicrobial resistance; Antibiotics; Public health; Infection control; Global health; Stewardship; Surveillance.

Introduction. Antimicrobial resistance (AMR) is defined as the ability of microorganisms to withstand the effects of drugs that once killed them or inhibited their growth. This phenomenon has been recognised as a critical challenge to global health, food security, and economic development. Infections caused by resistant organisms are associated with prolonged illness, increased healthcare costs, and higher mortality rates.

AMR is responsible for approximately 1.27 million deaths annually, with the highest burden observed in low- and middle-income countries. Drug-resistant tuberculosis, malaria, and bacterial infections have significantly undermined global disease control efforts. The spread of multidrug-resistant organisms in hospitals and communities has further complicated treatment protocols and weakened the efficacy of standard antibiotics.

Inappropriate prescribing of antibiotics in both human and veterinary medicine remains a primary driver of resistance. Self-medication, poor regulatory oversight, and inadequate infection prevention measures have contributed to the acceleration of AMR. Furthermore, the use of antimicrobials in livestock and agriculture has created reservoirs of resistance genes transferable to human pathogens.

The lack of innovation in antimicrobial development has exacerbated the crisis. Pharmaceutical investment in antibiotic research has declined due to high costs, low returns, and scientific challenges in discovering novel compounds.

Effective prevention of AMR requires a multifaceted and globally coordinated response. Antimicrobial stewardship programmes have been implemented in many healthcare systems to promote rational prescribing and optimise treatment outcomes. Improved diagnostic tools have enabled more targeted therapy, reducing unnecessary antibiotic exposure.

Infection prevention and control (IPC) measures such as hand hygiene, vaccination, and environmental sanitation play a critical role in limiting transmission. Surveillance systems such as the Global Antimicrobial Resistance and Use Surveillance System (GLASS) have enhanced data collection and facilitated international collaboration.

Education and awareness campaigns targeting healthcare professionals and the public are essential for changing behaviours related to antibiotic use. Moreover, global action plans such as the WHO Global Action Plan on AMR have provided a framework for national policy development and implementation.

Conclusion. Antimicrobial resistance represents a mounting global health crisis with far-reaching consequences. Without urgent and sustained intervention, common infections and minor injuries may once again become fatal. An integrated approach involving stewardship, surveillance, innovation, and public education is imperative to mitigate the spread and impact of AMR.

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