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EDITORIAL

ANTIMICROBIAL RESISTANCE (AMR) IN PAKISTAN: A GROWING CRISIS

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Antimicrobial resistance (AMR) arises when bacteria, viruses, fungi, and parasites adapt to withstand the medications intended to eliminate them. AMR represents a significant global health challenge that has the potential to disseminate among humans, animals, plants, and the environment. In 2019, bacterial antimicrobial resistance accounted for an estimated 1.27 million human fatalities globally, with the most significant impact felt in low- and middle-income countries, especially in sub-Saharan Africa and South Asia.[1] The significant threat of AMR in developing countries like Pakistan is well acknowledged, particularly where a portion of the population faces challenges in accessing education and healthcare. Similar to global trends, Pakistan has experienced a notable increase in infections attributed to resistant strains. A 2019 report from the World Health Organization (WHO) identified Pakistan as one of the top five nations experiencing the highest rates of neonatal mortality attributed to resistant bacteria[1]. The over-prescription of antibiotics in healthcare settings, sometimes for viral infections where antibiotics are ineffective, further accelerates AMR. This not only reduces the effectiveness of existing antibiotics but also limits the development of new, effective treatments.[2]

The agriculture and livestock sectors in Pakistan significantly contribute to the increase of AMR. The regular administration of antibiotics in healthy animals for the purposes of enhancing growth and preventing disease plays a significant role in the emergence of antibiotic-resistant bacteria. These resistant bacteria can enter the food chain, posing a risk to human health. Moreover, the indiscriminate application of antibiotics in both human and veterinary medicine has created a vicious cycle, where the resistance spreads across both domains.[3] AMR in Pakistan presents severe public health and economic challenges, as resistant infections lead to longer hospital stays, the need for more intensive and expensive treatments, and higher mortality rates, exacerbating the burden on an already strained healthcare system. The O'Neill report highlights that, by 2050, AMR could result in an estimated 10 million deaths annually worldwide, with low-income countries like Pakistan disproportionately affected. If not effectively addressed, AMR threatens to reverse decades of medical progress, crippling economies and causing widespread societal and healthcare disruptions.[4,5]

The fight against AMR in Pakistan requires a comprehensive, multi-sectoral approach. The government must strengthen its regulatory frameworks to ensure that antibiotics are only available with a prescription. Public awareness campaigns are also essential to educate the general population about the threats of self-medication and the status of completing prescribed antibiotic courses. Additionally, healthcare providers must be trained to follow appropriate guidelines for prescribing antibiotics, using them only when extremely important and confirming that the exact amounts and durations are prescribed. Hospitals, clinics and especially operation theaters must also implement strict infection control practices, including hand hygiene, sterilization, and the isolation of patients with resistant infections to prevent the spread of AMR within healthcare settings.

KEY WORDS: Antimicrobial Resistance; Public health; Pakistan.

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On the agricultural front, Pakistan must adopt policies to regulate the use of antibiotics in livestock farming. This includes reducing the use of antibiotics for growth promotion and strictly controlling their use for disease prevention, ensuring that antibiotics are only used under the guidance of veterinarians. Public health authorities must also work to improve waste management systems to prevent contamination of the environment with resistant bacteria.

Tackling AMR is a global challenge that requires in-

ternational cooperation. Pakistan should collaborate with international organizations such as the WHO, Food and Agricultural Organization (FAO), and the World Bank to access funding, share best practices, and develop a comprehensive national strategy to combat AMR. Pakistan's participation in global surveillance systems will also help track the spread of resistant pathogens and monitor the effectiveness of interventions.

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CONFLICT OF INTEREST
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All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.