Chapter 1
Resistance Phenotypes and Surveillance

Shahrukh Khan
Center for Disease Dynamics, Economics, and Policy, India

Jyoti Joshi
Center for Disease Dynamics, Economics, and Policy, India & Amity Institute of Public Health, Amity University, India

ABSTRACT

The emergence of drug resistance complicates surveillance and treatment of antimicrobial phenotypes. For example, the rise of Methicillin-resistant Staphylococcus aureus and carbapenem-resistant Enterobacteriaceae influence delivery of care. Moreover, a lack of surveillance programs in most of the developing world exacerbates the problem of MDR. Existing studies in humans are mostly retrospective single-center surveillance-based studies that look at the molecular makeup and prevalence of phenotypic resistance for several pathogens. Very few studies examined infection prevention measures or antimicrobial stewardship activities, and of those that did, none of them were multicenter. The aim of this chapter is to explore prevalent phenotypes in clinical settings and antimicrobial resistance (AMR) surveillance programs throughout the world.

INTRODUCTION

Antimicrobial resistance (AMR) threatens to upend decades of progress on managing infections. Antimicrobial drugs have saved life on earth from once-fatal diseases and risky procedures like surgeries and transplants, but their systematic misuse and overuse have transformed the bacterial population and limited the effectiveness

of these miracle drugs. Moreover, the interconnectedness of biomes has made the exchange of bacteria in the environment, animals and humans much easier. The challenge of AMR has led many experts to reconsider the effectiveness of current antibiotic therapies over the next 100 years with a dwindling pipeline of new drug research and development (R&D). Antibiotic usage outside of human medicine, like in agriculture for growth promotion creates another entry for antibiotics to enter our biome through our environment (Diallo, 2020). The broad scope of drug resistance requires effective collaboration among disciplines and countries to build robust surveillance program health outcomes. Similar plans to educate stakeholders and surveil infections to prevent antimicrobial resistance through hygienic infection control practices would sustainably optimize use of antimicrobial medicines in humans and animals. monitor antimicrobial resistant phenotypes to inform interventions. A "one health" approach, like the one proposed by the World Health Assembly in 2015, outlines an action plan that encourages collaboration among actors in human and veterinary medicine, finance, agriculture, environment and consumers. By creating programs, policies and research through multiple sector collaboration, a "one health" approach can achieve better public well being (GLASS WHO Report, 2017).

Figure 1. The One Health triad
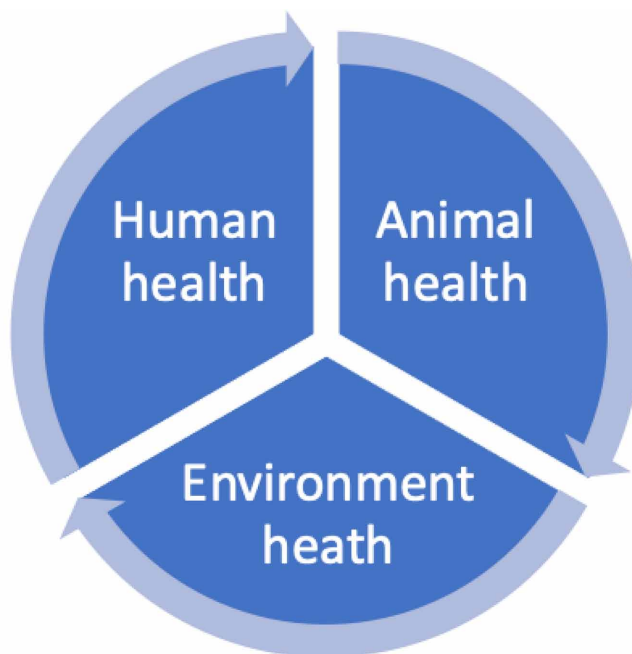
13 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/resistance-phenotypes-and-surveillance/284595

Related Content

Covid-19 in India-Emergence, Implications and Possible Precautionary Measure for Disease Transmission in Indian Healthcare Workers: Covid-19 in India- Emergence & Implications

 (2022). *International Journal of Health Systems and Translational Medicine (pp. 0-0).*

www.irma-international.org/article//282681

Enhancing Cybersecurity Protocols in Modern Healthcare Systems: Strategies and Best Practices

Muhammad Usman Tariq (2024). *Transformative Approaches to Patient Literacy and Healthcare Innovation (pp. 223-241).*

www.irma-international.org/chapter/enhancing-cybersecurity-protocols-in-modern-healthcare-systems/342829

Refinement of Hypothesis Testing in Conjugation Tables of r(c Size on the Example of Testing New Forms of Treatment

Lidiya Filippovna Taenvatand Mikhail Mikhailovith Taenvat (2022). *International Journal of Health Systems and Translational Medicine (pp. 1-13).*

www.irma-international.org/article/refinement-of-hypothesis-testing-in-conjugation-tables-of-rc-size-on-the-example-of-testing-new-forms-of-treatment/306691

Research on Denoising of Brain MRI of Alzheimer's Disease Based on BM3D Algorithm

Xin-lei Chen (2021). *International Journal of Health Systems and Translational Medicine (pp. 33-43).*

www.irma-international.org/article/research-on-denoising-of-brain-mri-of-alzheimers-disease-based-on-bm3d-algorithm/277368

Target Identification of HDAC8 Isoform for the Treatment of Cancer

A. Umamaheswari, A. Puratchikodyand Sakthivel Balasubramaniyan (2019). *Computer Applications in Drug Discovery and Development (pp. 140-172).*

www.irma-international.org/chapter/target-identification-of-hdac8-isoform-for-the-treatment-of-cancer/217072