Modeling the Transmission Dynamics of Antibiotic Resistant Bacteria

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Over the last two decades, many antibiotics that were formerly effective in combating bacterial infections in patients are no longer effective due to the evolution of resistant strains. Antibiotic-resistant bacteria (ARB) have rapidly emerged and spread throughout the world, threatening our ability to treat infectious diseases, resulting in prolonged illness, disability, and death, and increasing the cost of health care. In this talk, we will review some recent studies on modeling the transmission dynamics of antibiotic-resistant bacteria at three levels: the host-host population level, the within-host bacterial level, and the combined within-host and between-host level. We will also apply our modeling study to describe the transmission characteristics of methicillin-resistant *Staphylococcus aureus* (MRSA) in the emergency ward and respiratory intensive care unit in Beijing Tongren Hospital, China.