

ANTIMICROBIAL USE AND EMERGENCE OF INFECTIOUS DISEASES

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Antimicrobials are substances developed to kill or inhibit the growth of microorganisms. The first antimicrobial was developed in the late 1930's. The development of this group of drugs is arguably the most significant achievement in human and veterinary medicines of the 20th century. However, misuse of these drugs has resulted in increasing pathogen resistance against them. Infections caused by resistant microorganisms often fail to respond to conventional treatment, resulting in prolonged illness and greater risk of death. In Jamaica, incorrect use of antimicrobial agents (including use by untrained individuals) is contributing to the development of resistance against a number of these drugs.

Drug resistance in animals has major implications on human health since most agents can cause disease in both human and animals. A study by Louise Taylor and associates in 2001 showed that of the 1,415 infectious microorganisms known to be pathogenic to humans; 868 (61%) are zoonotic (able to be transferred from animals to human). The same drugs are used to control diseases in human and animals; therefore, a drug that cannot control a pathogen in an animal will not be able to control that pathogen in humans.

Drug resistance is highly associated with disease emergence. In 2001, of the then 1,415 known pathogenic species, 175(12.4%) were associated with emerging diseases. One hundred and thirty-two (75%) of those emerging pathogens are

zoonotic. Several studies indicated that the improper use of antimicrobials on for agricultural purposes was responsible for the recent emergence of resistant strains of *E. coli*, *Campylobacter* and *Salmonella*. According to The World Health Organisation for human health (WHO), about 440 000 new cases of multidrug-resistant tuberculosis emerge annually, causing at least 150 000 deaths worldwide. Similar numbers are reported for other disease agents.

Due to evolution and natural selection it is expected that organisms will develop resistance against antimicrobials; however, prudent use of antimicrobial agents may help to slow down the selection for resistance. This should be based on knowledge of susceptibility patterns of the disease agents and take into account the potential problems for human health.