



WHO Global Strategy for Containment of Antimicrobial Resistance

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Infectious diseases still account for 45% of deaths in low-income countries, and 85% of these deaths are due to five diseases: acute respiratory infections, diarrhoeal disease, HIV/AIDS, tuberculosis and malaria. Resistance to anti-infectives is today challenging our ability to treat effectively all of these diseases. It not only increases the mortality and morbidity due to infectious disease but has an important impact on the cost of health care. In the case of pneumonia, meningitis and some STIs, the switch from first-line to second- or third-line treatment increases drug costs by up to 90-fold. Although there are few examples at present of pathogens resistant to all known antimicrobials, vancomycin-intermediate *Staphylococcus aureus* and vancomycin-resistant *Enterococci* and multiresistant *S. typhi* are approaching that situation.

Relatively high levels of availability and consumption of anti-infectives in developing countries have led to disproportionately higher incidence of inappropriate use and greater levels of resistance than in developed countries. Surveys of antibiotic use in these settings show antibiotics prescribed in 35-60% of clinical encounters, although appropriate in less than 20%. A number of studies have shown a correlation, both over time and geographically, between antimicrobial use and the spread of resistance.

Many factors influence inappropriate prescribing, dispensing and use of anti-infectives in human medicine. Lack of knowledge is a major cause of inappropriate use globally, leading to overprescription, use of unsuitable dosages, incorrect duration and inappropriate selection of antimicrobial, such as the use of newer, more expensive drugs when older, cheaper drugs are clinically adequate. In a number of countries, over 80% of patients buy their antimicrobials at private pharmacies (or in the market place) without any medical advice. In other countries less than 10% of dispensers receive any formal training, and their guidance is likely to be influenced more by economic incentives. Lack of ability to pay often results in the purchase of incomplete courses or cheaper drugs that may be substandard or counterfeit. In some countries most of a physician's salary comes from drug prescriptions, which inevitably leads to overprescription and the prescribing of expensive drugs instead of cheaper yet adequate ones.

There is widespread belief among patients that antimicrobials administered by injection are more effective than those given orally, and in certain countries 70% of injections given have proved to be unnecessary. Patients also contribute to resistance emergence through poor compliance to the prescribed course of treatment, especially if their symptoms are mild and resolve quickly. In many developing countries, pharmacies stock large numbers of different brands of the same antimicrobial, as a result of specific patient demand.

Although the majority of antimicrobial use occurs in the community, the most intensive use is in hospitals.

Hospital-acquired infections, which account annually for 40,000 deaths in the USA alone are almost invariably caused by antimicrobial-resistant organisms. Transmission of these organisms from hospital personnel to patients and *vice versa* is a major factor, and the rigorous implementation of simple infection control practices such as handwashing and changing gloves would have a significant effect.

At government level, weaknesses in legislation or its enforcement contribute to resistance by allowing the circulation in the market of substandard or counterfeit antimicrobials. Advertising and promotion of drugs undoubtedly increases sales, and poor regulation of these activities encourages unnecessary use. Surveillance of resistance in many countries is hampered by a lack of adequate laboratory facilities.

The use of antimicrobials in animals destined for human consumption undoubtedly contributes to the emergence and spread of resistance. The WHO Global Principles for the Containment of Antimicrobial Resistance in Animals intended for Food called for a phasing-out of the use for growth promotion in farm animals of antimicrobials with therapeutic relevance for humans.

In September 2001 the WHO Global Strategy for Containment of Antimicrobial Resistance was issued. This included over 60 recommendations for implementation, organized into a number of priority groups, together with indicators for monitoring implementation and outcomes. Most of the responsibility for implementing interventions will fall on national governments.

National governments and health care systems can have considerable impact on limiting the emergence and development of antimicrobial resistance through the introduction of legislation and policies concerning the development, licensing, distribution and sale of antimicrobial agents. National governments also have the responsibility for coordinating surveillance networks and for directing educational efforts to improve understanding about appropriate antimicrobial use.

Countries with poor antimicrobial resistance records need to be supplied with advocacy tools that will convince governments of the importance of making antimicrobial resistance containment a national priority (e.g. an analysis of the costs of antimicrobial resistance and the benefits of its containment), that will influence prescribers to adhere to sound antimicrobial prescription practices, and that will increase public awareness of antimicrobial resistance.

The first essential action in enabling such initiatives to proceed is the creation in each country of a national inter-sectoral Task Force on antimicrobial resistance, composed of health care professionals, veterinarians, agriculturalists, pharmaceutical manufacturers, government, media representatives, consumers and other interested parties.