

PLANT AGRICULTURE

In contaminated areas, water containing antibiotic residues and drug-resistant bacteria can be absorbed into food products through cropland irrigation. In addition, croplands are often treated with antibiotic-rich manure (from medicated animals) to improve plant growth. There is also evidence that untreated solid waste from the antibiotics manufacturing process is being used as fertiliser in China. This can result in antibiotics ending up directly in the food we eat, or being washed into rivers via run-off.

ANIMAL AGRICULTURE

Antibiotics are routinely used on animals, either to prevent disease or as growth promoters. Worldwide, significantly higher volumes of antibiotics are used in food animals than in human medicine. These antibiotic residues, can be passed on to humans through consumption of meat or dairy products. Antibiotics can also enter the environment at this point through animal excretion (with most of the active ingredient unmetabolised) and run-off from farms. Superbugs can be passed on directly from livestock to the humans who tend them.

INTERNATIONAL TRAVEL:

Antibiotic-resistant bacteria can be carried by travellers, who can then transport superbugs around the world.

PHARMACEUTICAL MANUFACTURING FACILITIES

Factories where antibiotics are produced are major point sources of antibiotic residues, notably in China and India, where most of the world's antibiotics are made. In an alarming number of cases, manufacturers simply dump untreated waste in the environment, or fail to treat it appropriately

HOSPITALS

Hospitals are a key point source for AMR as they contain large numbers of people using a cocktail of different antibiotics. High levels of different antibiotics in excreted matter passes directly into rivers or through wastewater plants that are often unable to filter antibiotic residues.

TOWNS & HOUSES

Human excretion of antibiotics, which leaves most of the active ingredient unmetabolised, is a key vector of drug resistance. In much of the developing world, large volumes of raw sewage enter rivers, lakes, and groundwater directly without any prior treatment.

WASTEWATER AND SEWAGE TREATMENT PLANTS

Most wastewater treatment plants around the world are not equipped to filter antibiotic substances and other pharmaceutical micropollutants, which means that residues remain present even after the water has been treated. Sewage treatment plants, where human faeces containing a wide diversity of bacteria combine with antibiotic residues present an ideal breeding ground for drug resistance.

FISH FARMS

Farmed fish living in close confinement often need to be medicated to prevent the onset of disease. The antibiotics are often scattered into the water, thereby entering the environment directly.

Antibiotics entering the environment kill off non-resistant bacteria, leaving only 'resistant' bacteria behind. These remaining bacteria can then multiply and pass on their resistance to others.

SOURCES OF AMR