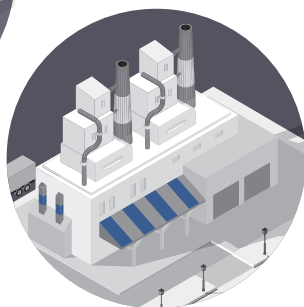


Antibiotic Resistance (AR) and the Environment

Antibiotics save lives, but any time they are used—in people, animals, or crops—they can cause side effects and can contribute to the development of antibiotic resistance. When antibiotics or resistant bacteria and fungi are introduced into the environment, there is an opportunity for these elements to interact with other germs, including those naturally occurring in these settings.



- ◀ Antibiotics and resistant germs can spread through wildlife and through the environment, including bodies of water, and can make people sick.
- ◀ Waste (poop) from people in hospitals and animals on farms, applying antibiotics as pesticides, and antibiotic manufacturing (commonly occurs outside of the United States) can result in antibiotics and resistant germs in the environment.
- ◀ Antibiotics and resistant bacteria and fungi in the environment can accelerate the development of AR.
- ◀ Untreated sewage from septic systems and sewer leaks can contaminate the environment.
- ◀ Hospital effluent (liquid waste or sewage discharged into a waterway) is a significant source of antibiotic residues in water.



Learn more about CDC's
AR Solutions Initiative:
www.cdc.gov/DrugResistance

Scan with your smartphone camera to watch an animated video on antibiotic resistance



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

CDC Fights Antibiotic Resistance (AR) in the Environment

The United States is positioned for a better and faster response to AR because of the strategic leadership and investment of CDC's AR Solutions Initiative, which invests in national infrastructure to detect, respond, contain, and prevent resistant infections across healthcare, food, and community settings.

**TO MOVE
FORWARD**

CDC RESEARCH PRIORITIES

- Enhancing **laboratory capacity** to detect and report antibiotic resistance with global health implications.
- Establishing or strengthening **national tracking systems** to respond rapidly to outbreaks, identify emerging pathogens and trends.
- Identify and test new methods for **collecting AR data** from the environment, including water and soil.

In the next five-year National Action Plan to Combat AR (CARB), CDC aims to:

- Expand domestic and global capacity to fight AR in the environment across food, water, and the community
- Map existing AR ecology across One Health and monitor shifts over time
- Improve international collaboration and capacities for AR prevention, surveillance, infection control

CDC IN ACTION

- Studying antibiotic-resistant bacteria generated during wastewater treatment and evaluating the risk of exposure, colonization, and infection to treatment plant workers. This project formed the basis for CDC's expanded efforts to identify SARS-COV-2 from wastewater.
- Supporting investigators to sample surface water for human and agricultural waste and antibiotic-resistant bacteria. This project will help to determine how antibiotics, pathogens, and resistance elements move across environments and potentially pose a risk to human health.
- Studying the effect of azole use on crops to contain the spread of azole-resistant *Aspergillus fumigatus*. Azole use in human medicine and agriculture can contribute to resistance to antifungals.
- Investigating how antibiotic-resistant bacteria from concentrated poultry farms impact aquatic ecosystems.



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