



Water Quality and Health

Fighting Antibiotic Resistance at Home and Globally

The conclusion of a series of articles on the challenge of antimicrobial resistance

By the Water Quality and Health Council

We all have a stake in the outcome of the battle against antimicrobial resistance. Everyone, from the global public health expert to the ordinary citizen, can play a role in reversing a dangerous trend in the balance of power between humans and pathogens.



Antimicrobial resistance has the potential to erase the astonishing gains made possible by the use of antibiotics over the past 70 years. According to [a report](#) from the Infectious Diseases Society of America, although the widespread availability and effectiveness of antibiotics has positively impacted surgery, care of premature infants, cancer chemotherapy, care of the critically ill, transplantation medicine, and even our ability to respond to bioterrorism and pandemics, that widespread

availability along with misuse has resulted in antimicrobial resistant pathogens. This unintended consequence is already exacting a toll on both human health and wealth, as highlighted in a [new UK report](#). The toll will skyrocket if we fail to respond to the challenge of antimicrobial resistance over the course of the next several decades.

Despite some encouraging new discoveries (see sidebar), pharmaceutical innovation has not kept pace with the ever-evolving resistance of our microscopic enemies. Factors favoring development of antimicrobial resistance include overuse and misuse of antibiotics for both man and animals. Inadequate attention to appropriate disinfection measures also contribute, as evidenced by recent news that a lack of wastewater treatment in Rio de Janeiro, could result in the exposure of [Olympic athletes to resistant superbugs](#) in water venues chosen for the coming 2016 Olympic sailing and wind-surfing events.

What Everyone Can Do to Fight Antimicrobial Resistance

Each of us can turn our concern over antibiotic resistance into action. First, we can focus on preventing the illnesses that require

The Promise of New Discoveries

Researchers recently [announced](#) the preliminary discovery of a new class of antibiotics that may be effective against a wide range of drug-resistant bacteria for decades. The new class of drugs was identified using innovative culturing techniques. These antibiotics attack fat molecules in bacteria cell walls. A similar mechanism is responsible for 30 years of successful use of the antibiotic vancomycin before antimicrobial resistance developed against it.

antibiotics by adopting a healthy life style. Promote a strong immune system with a healthy diet, regular exercise and adequate rest, and make sure family members and other close contacts are up to date with vaccinations and flu shots. Implement safe disinfection practices in the home when a family member develops an infectious illness. Isolating sick individuals and disinfecting frequently touched surfaces helps prevent the spread of infection to others. Safe food handling is also extremely important in preventing infectious illness. Consumers can consider purchasing meat and egg products that indicate animals were raised on a diet without unnecessary antibiotics. The U.S. Food and Drug Administration, for example, is working with industry to promote only the appropriate use of antibiotics in animal agriculture as described on its website, "[Judicious Use of Antimicrobials](#)".

If antibiotics are prescribed, they should be taken exactly according to directions. Antibiotic use should not be discontinued until the entire prescribed dose is taken (unless otherwise instructed by a doctor), and antibiotic prescriptions should not be shared with others. If any medication remains, it should be disposed of properly – returned to the pharmacy, not flushed down the toilet.

Antimicrobial Resistance as a Sustainable Development Goal

Antimicrobial resistance is beginning to be recognized as a global challenge. Currently, representatives of the world community are developing a set of global Sustainable Development Goals¹ for the UN's "post-2015 agenda". To date, the UN General Assembly has accepted a set of [17 proposed Sustainable Development Goals](#) as a starting point for the post-2015 agenda. The goals encompass everything from poverty eradication to building resilient infrastructure and providing safe drinking water and sanitation. We suggest Goal #3, to "Promote healthy lives and ensure well-being for all at all ages," include a target that promotes best practices to combat antimicrobial resistance, including responsible use of antibiotics, policies that encourage drug innovation and infection control and prevention.

When it comes to antimicrobial resistance, we stand at a crossroads: The next steps determine the future.

¹ These goals will further the progress achieved under the UN's Millennium Development Goals (2000-2015).