PRESIDENT'S MESSAGE

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Antimicrobial Resistance

Antimicrobial resistance, also known as antibiotic resistance, is the "ability of microorganism (like bacteria, viruses, and some parasites) to stop an antimicrobial (such as antibiotics, antivirals, and antimalarials) from working against it. As a result, standard treatments become ineffective, infections persist, and may spread to others" (World Health Organization, 2019).

Why should sanitarians, environmental health specialist, and other professionals working in the environmental health field be concerned about antimicrobial resistance? Antimicrobial resistance has the potential to affect the health of all people in our communities. Last September, the U.S. government launched the Antimicrobial Resistance Challenge with the United Nations General Assembly. The Antimicrobial Resistance Challenge is a way for governments worldwide, including state and local governments, private industries, and nongovernmental organizations, to make formal commitments that further the progress against antimicrobial resistance. It encourages a One Health approach (www.onehealthinitiative.com), which recognizes that the health of people in our communities is connected to the health of animals and the environment. You can find more on social media using #GlobalAMRChallenge.

There are five commitment areas in the Antimicrobial Resistance Challenge.

1. Tracking and data: Share data and improve data collection.
2. Infection prevention and control: Reduce the spread of resistant pathogens.

Why should professionals working in the environmental health field be concerned with antimicrobial resistance?

3. Antibiotic use: Improve appropriate antibiotic use, including ensuring access to these drugs.
4. Environment and sanitation: Decrease antibiotics and resistance in the environment, including improving sanitation.
5. Vaccines, therapeutics, and diagnostics: Invest in development and improved access.

I would say environmental health is and should be involved in areas 1, 2, and 4.

Several private companies with environmental health staff are working to use risk-based approaches to combat antimicrobial resistance through hygiene and sanitation program implementation. The Connecticut Department of Public Health, with its laboratory staff, epidemiologists, and environmental health specialists, is committed to expanding capacity within Connecticut to detect, prevent, and respond to antimicrobial resistance.

In December, the Centers for Disease Control and Prevention (CDC), UK Science and Innovation Network, and Wellcome Trust released a report highlighting the presence of resistant microbes and antimicrobials in the environment (https://wellcome.ac.uk/sites/default/files/antimicrobial-resistance-environment-summary.pdf). The scientific evidence shows that antimicrobials and antimicrobial-resistant microbes are present and can persist and travel throughout the environmental. Environmental sampling and monitoring are needed more than ever to track the changes taking place with resistance in these pathogenic organisms. A recent study found that as many as 162,000 people have died from multidrug-resistant infections every year in the U.S., which is nearly 7 times higher than CDC estimates from 2013 (Burnham, Olsen, & Kollef, 2019).

I want to make you aware of another lesser known group that is looking at antimicrobial resistance. The National Antimicrobial Resistance Monitoring System (NARMS) is a U.S. public health surveillance system that tracks antimicrobial resistance in foodborne and other enteric bacteria. NARMS is an interagency partnership among CDC, the Food and Drug Administration, the U.S. Department of Agriculture, and local and state health departments. Surveillance began in 14 sites in 1996 and became nationwide in 2003. NARMS monitors antimicrobial resistance among enteric bacteria in three sources: humans, retail meats, and food animals.

The information collect by NARMS is important. Antimicrobial use in humans and animals can lead to the development of antimicrobial-resistant bacteria that cause human infections.

The resistant bacteria can share their resistance with other kinds of bacteria to create new resistant bacterial strains. Most enteric infections are self-limiting but antimicrobial agents are essential to treat severe illness. If pathogens are resistant to antimicrobial agents, illness can be prolonged or more severe. Measuring antimicrobial resistance in bacteria isolated from people, food, and food animals is central to understanding and preventing transmission of antimicrobial-resistant infections. Data provided by the NARMS program inform the development of public health interventions and policies designed to protect people from the threat of resistant enteric infection.

I will close with two quotes. The first is from Dr. Tedros Adhanom Ghebreyesus, director-general of the World Health Organization. He said, when emphasizing the key of prevention in addressing antimicrobial resistance, "Research and development alone is not the answer. We need to take cross-sectoral action to address the root cause of the problem. For example, we can prevent infections in the first place with improved sanitation and hygiene."

The second quote is from the film, *Resistance: Not All Germs Are Created Equal*. I would highly recommend this film to all of you. The quote is, "It's their genes against our wit." What is occurring should be a wake-up call for all of us.

References

Burnham, J.P., Olsen, M.A., & Kollef, M.H. (2019). Re-estimating annual deaths due to multidrug-resistant organism infections. *Infection Control & Hospital Epidemiology*, *40*(1), 112–113.

World Health Organization. (2019). *Antimicrobial resistance*. Retrieved from https://www.who.int/antimicrobial-resistance/en

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