Antimicrobial Resistance (AMR)

AMERICAN SOCIETY FOR MICROBIOLOGY

Antimicrobial resistance (AMR) is one of the most daunting public health challenges in the United States and worldwide. It is considered a global crisis by the World Health Organization, the G20 and the United Nations. AMR occurs when bacteria, viruses, fungi and parasites change over time and no longer respond to medicines or antimicrobial agents making infections harder to treat and increasing the risk of disease spread, severe illness and death. The overuse of antimicrobial agents in medicine, production of food animals and crop protection have caused increasing resistance to those agents.

ASM and its members are tackling AMR from a variety of health and other professions—it is a complex problem that requires multifaceted solutions. Urgent global action is needed across multiple settings and industries to protect people and animals from AMR threats.

According to a 2022 Lancet study, antimicrobial resistance itself caused
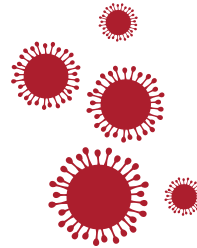
1.27 million deaths in 2019

4.95 million deaths where antimicrobial resistance played a role

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)02724-0/fulltext

Invest robustly in basic, translational and clinical research to better understand how microbes become resistant, and develop more precise clinical diagnostics, novel therapeutics and vaccines. Bolster research on neglected factors such as the roles of waste and wastewater in developing resistance, usage in agriculture, and environmental factors affecting AMR emergence, surveillance and prevention.

Support dedicated prevention and infection control efforts in the community and in health care settings. Better infection control in hospitals has reduced deaths from antibiotic-resistant infections in this setting by 28% since 2013.

Provide incentives for better stewardship of the antimicrobials currently available to patients, and promote policies to develop market-based incentives to foster the development and marketing of new antibiotics, both for humans and animals. We know that improving conscientious antibiotic use reduces the selective pressure on microorganisms, slowing the development of resistance.

Boost national and global **AMR surveillance** to inform action plans to combat antimicrobial resistant organisms and evaluate the impact of these interventions.

Support expanded use of genomics technologies against AMR pathogens, including broader application to veterinary and agricultural research. Deploying technologies such as advanced molecular detection funded by CDC leads to more rapid and accurate diagnosis and treatment. These genomic technologies should be well funded and accessible across multiple federal agencies, including USDA and EPA.

Harmonize U.S. policy with global policy frameworks and expand laboratory capacity and public health infrastructure in low- and middle-income countries. AMR does not recognize geopolitical borders and addressing AMR will require a coordinated global approach and investments in areas with the highest burden of infections.

Antimicrobial Resistance (AMR)

Antimicrobial resistance (AMR) occurs when microbes (bacteria, viruses and fungi) develop the ability through genetic mutations to defeat the antibiotics, antivirals and antifungals designed to kill them. As a result, the microorganisms continue to grow and develop resistance to therapies. Infections caused by antibiotic-resistant bacteria are difficult—sometimes impossible—to treat.

ASM supports the One Health approach to addressing AMR

HEALTHY ENVIRONMENT

HEALTHY ANIMALS

HEALTHY PEOPLE
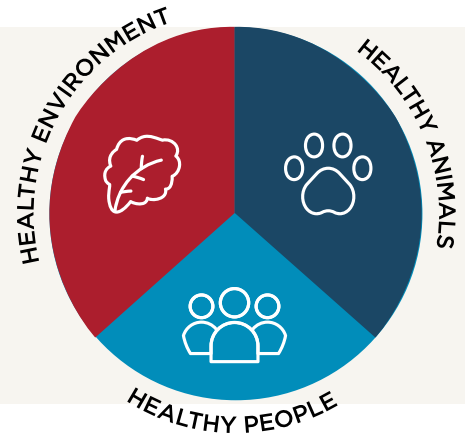
U.S. Government Role:
A Multi-Agency Effort

The Centers for Disease Control and Prevention (CDC) is charged with implementing activities outlined in the U.S. National Action Plan for Combating Antibiotic-Resistant Bacteria. Through its Antibiotic Resistance Solutions Initiative, CDC invests in national infrastructure to detect, respond, contain and prevent resistant infections across healthcare settings, food and communities. Through these investments, CDC is transforming how the nation and the world respond to antibiotic resistance. The CDC's Center for Global Health detects, prevents and responds to infectious disease threats that originate outside U.S. borders, including AMR.

USAID's global health security program provides technical assistance to partner countries to prevent and respond to rising rates of AMR in resource-limited settings.

The National Institutes of Health (NIH) funds basic, translational and clinical research that is essential to understanding AMR and developing tools to address drug-resistant infections including antibiotics, vaccines and diagnostics.

The Defense Health Program at the Department of Defense funds research and development to prevent, mitigate and treat drug-resistant bacteria in wounds. It also supports the MultiDrug Resistance Surveillance Network, which collects and characterizes bacterial isolates.

The U.S. Department of Agriculture (USDA) oversees the appropriate use of antibiotics in agriculture. Research funded by the USDA is essential to understanding pathogen resistance mechanisms and antibiotic alternatives, as well as improving animal management and husbandry practices.

The Food and Drug Administration (FDA) is responsible for approval of all new antimicrobials. FDA receives designated funding to address antibiotic resistance through several programs including the National Antimicrobial Resistance Monitoring System (NARMS).

The Agency for Healthcare Research and Quality (AHRQ) supports research and interventions that improve antibiotic stewardship in healthcare settings.

The Biomedical Advanced Research and Development Authority (BARDA) works to secure our nation from threats of all kinds, including AMR. BARDA's public-private partnership model is uniquely positioned to work with industry partners to finance research and development, where traditional commercial market incentives do not exist, that will bring safe and effective antimicrobial products to market.