

ANTIBIOTIC RESISTANCE 101: AN OVERVIEW

The Antibiotic Resistance Action Center (ARAC) at the Milken Institute School of Public Health at George Washington University was created to preserve the effectiveness of antibiotics by engaging in research, advocacy, and science-based policy. ARAC is focused on finding out-of-the box solutions to antibiotic resistance, one of the greatest public health threats of our time.

What are antibiotics?

- Antibiotics are drugs that kill bacteria or inhibit their growth
- Antibiotics can be used to treat bacterial infections in people and animals
- Antibiotics make it possible to safely perform medical procedures and treatments ranging from caesarean section to chemotherapy for cancer patients

What is antibiotic resistance?

- Antibiotic resistance occurs when bacteria mutate and become resistant to the effect of antibiotics

What does a post-antibiotic future look like?

- Today, tens of thousands of people in the U.S. die of antibiotic-resistant infections each year
- As bacteria become increasingly resistant to antibiotics, even common infections - such as urinary tract infections - will be difficult to treat and can become life-threatening
- In the next 30 years, antibiotic-resistant infections are expected to overtake cancer as the leading cause of death worldwide, and experts predict that based on current estimates, could kill one person every three seconds





Who is at the greatest risk?

- Today, those at the greatest risk for antibiotic-resistant infections are young children, cancer patients, and people over the age of 60
- Patients needing surgery and routine procedures such as prostate biopsy are also at higher risk for antibiotic-resistant infection, as pre-surgery antibiotics become less effective
- If trends continue, antibiotic-resistant infections are predicted to dramatically impact women's health by making childbirth and gynecologic surgeries less safe

How did we get in this mess?

- Widespread antibiotic use in human medicine and livestock production has helped fuel the growth of antibiotic-resistant bacteria (i.e., superbugs)
- In the developing world, antibiotics are often sold without prescription and the lack of clean water and good sanitation helps superbugs spread among the population
- Just as we are facing a major global crisis with antibiotics, pharmaceutical companies are shutting down their antibiotic development efforts in pursuit of more lucrative drugs

How can we avoid this crisis?

- We must use antibiotics more carefully in people and animals to end the rise in antibiotic-resistant infections
- We must prevent infections and thus eliminate the need to treat them
- We need to develop new antibiotics to treat antibiotic-resistant infections
- We need to develop new tools to prevent the spread of antibiotic-resistant bacteria

What is the Antibiotic Resistance Action Center doing?

- We are conducting cutting-edge research to show the major drivers of antibiotic-resistant infections and how to stop them
- We are working with health care providers to educate clinicians and patients to use antibiotics more responsibly
- We are working with food companies to develop market-based tools to reduce unnecessary antibiotic use in livestock
- We are disseminating information and educating the public and policymakers about antibiotic resistance

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