Investment in research saves lives and money

Antibiotic Resistance

Antibiotic resistance occurs when a bacterial infection no longer responds to an antibiotic treatment that was once effective. Multi-drug resistance occurs when an infection is resistant to multiple antibiotics.

Today

- Every year, 2 million people are infected with antibiotic-resistant bacteria in the United States.⁶
- At least 23,000 people die each year in the United States as a direct result of antibiotic-resistant infections. Many more die from complications caused by these infections.⁴
- On average, 1 in every 10 patients is affected by health care-associated infections (HAIs). 70% of the bacteria causing these infections are resistant to at least one drug commonly used for treatment.**
- Antibiotic-resistant HAIs can more than double the likelihood of death.⁴
- While bacteria continue to grow more resistant to our current arsenal of antibiotics, research has not been able to keep pace. Every antibiotic currently available is a variation of antibiotics discovered in the 1900s.³

The Cost

- In the United States, antibiotic resistance adds $20 billion in excess direct health care costs, with additional costs to society for lost productivity as high as $35 billion a year.⁷
- By 2050, drug resistant infections are estimated to cost the global economy $100 trillion.⁴
- The estimated cost per patient hospitalized with an antibiotic-resistant infection ranges from $18,588 to $29,069, depending on the type of infection.⁵
- Treating an individual with multi-drug resistant tuberculosis costs $150,000, which is roughly nine times more than the cost for individuals infected with non-drug resistant forms of the disease.⁸

HOW RESEARCH SAVES LIVES

- In 2017, the Food and Drug Administration (FDA) approved the first diagnostic tool that can detect bloodstream infections and identify suitable antibiotic treatment within six hours. This innovation reduces the mortality rate by half and allows optimal therapy 1-2 days faster than previous methods.**
- Health care-associated infections (HAIs) result in almost 100,000 deaths each year, with especially elevated central line-associated blood stream infections (CLABSI) rates in intensive care units. When implemented, the Comprehensive Unit-based Safety program supported by the Agency for Healthcare Research and Quality (AHRQ) reduced CLABSI by 41%.⁹

HOW RESEARCH SAVES MONEY

- Health professionals are adopting best practices for responsible antibiotic use, known as antibiotic stewardship, to slow the spread of antibiotic resistance. A University of Maryland study showed that an antibiotic stewardship program saved $17 million over eight years by shortening hospital stays and improving patient care.¹
- Community-associated methicillin-resistant Staphylococcus aureus (CA-MRSA) is a substantial economic burden due to high hospitalization and mortality rates. According to researchers at the University of Pittsburgh, early identification and appropriate treatment could save an estimated cost of at least $1.4 billion annually.⁶

perspective

Vance Fowler, M.D.
Principal Investigator of Antibacterial Resistance Leadership Group (ARLG) at Duke University

Vance Fowler, M.D., has spent more than 20 years investigating antibiotic resistance. When the National Institutes of Health (NIH) established the Antibacterial Resistance Leadership Group (ARLG) in 2013, Dr. Fowler became one of the two principal investigators leading the effort to further understand and combat antibacterial resistance. In the four years since its inception, the ARLG has reviewed more than 70 study proposals and initiated more than 35 clinical studies to optimize treatment regimens, test new drugs, and evaluate the effectiveness of antibacterial stewardship programs.

As our nation seeks to address this pervasive health care crisis, it is crucial to understand the impact of antibiotic resistance. Dr. Fowler sees the rising incidence of drug-resistant bacteria as a “clear, present and increasingly common threat to all of us.” He believes that “only through research can we identify the drugs and diagnostics for tomorrow, while also defining the optimal use of our available antibiotics today.”

Dr. Fowler is thankful for the vital support from the Centers for Disease Control and Prevention (CDC) and NIH. He says that “finding ways for these awe-inspiring agencies to work together on the common problem of antibiotic resistance is a great first step for innovation.” Looking forward, Dr. Fowler perceives the need for increased funding opportunities to support sustained efforts to combat this public health threat.
Hope for the Future

Researchers at Yale University and the University of California at Merced are working together to use viruses to attack and kill antibiotic-resistant bacteria. In this novel strategy, the virus effectively reverses antibiotic resistance by lowering bacteria inhibition to antibiotics.*

Combating Antibiotic Resistant Bacteria Biopharmaceutical Accelerator (CARB-X), one of the world’s largest public-private partnerships, is searching for novel classes of antibiotics, pursuing non-traditional ways to fight resistance, as well as testing new approaches to target and kill bacteria.‡

In 2016, the CDC formed the Antibiotic Resistance Laboratory Network to track changes in antibiotic resistance and rapidly detect emerging bacterial threats using data from state labs and the National Tuberculosis Molecular Surveillance Center (National TB Center).°

With an estimated 6,700 cases annually, multi-drug resistant Pseudomonas aeruginosa is one of the leading causes of post-surgery complications and deaths in U.S. intensive care units. An NIH-funded study at the University of Pittsburgh found a potentially promising treatment for pulmonary Pseudomonas infections using an antimicrobial peptide derived from frog skin.^

The Bottom Line

If antibiotic resistance is left unchecked, researchers estimate that by 2050, it could surpass cancer as a leading cause of death. Investment in research is crucial to the discovery of new antibiotics that are urgently needed to treat drug-resistant infections and save lives.

Nearly Half Doubt Progress in Medical Research

Do you believe we are making enough progress in medical research in the U.S.?


CDC Funding to Combat Antibiotic Resistance by State in 2016

SOURCE: CENTERS FOR DISEASE CONTROL AND PREVENTION

The Albert and Mary Lasker Foundation is a founding partner in this series of fact sheets. www.laskerfoundation.org

44.1.118