Antimicrobial drugs save countless lives, but bacteria and other microbes can evolve in ways that enable them to resist a drug’s intended effect. Misuse or overuse of antibiotics has made antibiotic resistance (AR) evolve even faster. The increasing number of drug-resistant infections is a serious and growing global health problem. In the United States alone, an estimated 2 million people develop drug-resistant bacterial infections each year, leading to more than 23,000 deaths.

THE COST OF ANTIMICROBIAL RESISTANCE

- at least 23,000 deaths in the U.S. annually due to antimicrobial resistant infections
- over 2 million illnesses caused by antimicrobial resistant infections
- 21 - 34 billion annually: the cost of infections caused by antimicrobial resistant pathogens to the U.S. healthcare system
- 8 million additional days spent in hospitals due to antimicrobial resistant infections

Klebsiella, a common Gram-negative bacteria, is becoming increasingly resistant to antibiotics, including carbapenems, a class of powerful antibiotics that is often the last line of defense against Gram-negative infections.

Patients with antibiotic resistant Klebsiella are over two times likely to die from the infection.

RISK OF DEATH
Antibiotic-resistant vs. non-resistant Klebsiella bacteria

Patients who receive specialized care will be at highest risk
- Chemotherapy
- Complex surgery
- Joint replacements
- Organ transplants
- Chronic conditions
- Dialysis

Groups particularly at-risk for antibiotic resistant infections
- Young children
- Premature infants
- Elderly
- Soldiers and Veterans
Antimicrobial resistance is recognized as one of the greatest threats to human health worldwide, and a wide array of organizations such as the President’s Council of Advisors on Science and Technology (PCAST), World Health Organization (WHO), European Union (EU), and others have dedicated resources and efforts to combat the threat.

A leading factor in the increasing prevalence of antibiotic resistance and associated illnesses and deaths is inappropriate use in both human medicine and agriculture.

**SPOTLIGHT ON COMMUNITY-ACQUIRED BACTERIAL PNEUMONIA**

- #1 cause of death in the U.S.
- Disproportionately impacting young children and older Americans
- 5-10 million cases each year
- 1.1 million hospitalized each year

**SPOTLIGHT ON CANCER TREATMENT**

- 600,000 patients receiving chemotherapy
- 60,000 of those patients will be hospitalized with an infection
- 1 in 14 of those patients will die

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**WHAT IS NEEDED TO COMBAT ANTIBIOTIC RESISTANCE: A ONE HEALTH APPROACH**

**RESEARCH AND DEVELOPMENT FOR NEW ANTIBIOTICS AND RAPID DIAGNOSTICS**

In order to address the difficulty and financial cost inherent in developing antibiotics and rapid diagnostics, companies need incentives. Push incentives focus on removing barriers to developer entry by affecting the cost to the developer for investments in research and development and tend to impact the earlier stages of the development process. Pull incentives provide the promise of financial reward after a technology has been developed.

**ANTIMICROBIAL STEWARDSHIP**

Antimicrobial stewardship refers to coordinated interventions by promoting the selection of the optimal antimicrobial drug regimen, dose, duration of therapy, and route of administration. Antimicrobial stewards seek to achieve optimal clinical outcomes related to antimicrobial use, minimize toxicity and other adverse events, reduce the costs of healthcare for infections, and limit antimicrobial resistance.

**INFECTION PREVENTION**

Healthcare-associated infections are a significant factor fueling the rise of antimicrobial resistance. Policy decisions which support the evidence-based practices of infectious diseases physicians are the best approach for preventing healthcare-associated infections and protecting patients and communities.

**INFECTIOUS DISEASE WORKFORCE**

ID physicians make significant contributions to patient care, biomedical research, and public health. Their leadership and services save lives, prevent costly and debilitating diseases, and drive biomedical innovation. Their involvement in patient care lowers rates of mortality and 30-day readmission rates in hospitalized patients, shorter lengths of hospital stay, fewer intensive care unit (ICU) days, and lower Medicare charges and payments.

**SURVEILLANCE AND DATA COLLECTION**

Surveillance and data collection are vital in the effort to curb antimicrobial resistance. Surveillance allows public health officials to identify genes conferring resistance to last-resort antibiotics before they make their way into the human population. Identifying these worrisome genes early and collecting samples is a great boon for research and preparedness.