 

Antimicrobial resistance (AMR) is an urgent public health threat. Infections caused by resistant organisms are associated with high mortality rates and costs compared to those susceptible to antimicrobial therapy. Delays in appropriate diagnosis and treatment increase the chances of a negative clinical outcome for patients with these infections. Understanding the local clinical and economic impact of drug resistant infections may help prioritize resources and advance research and understanding of AMR.

The Estimating the Burden of AMR tool quantifies the estimated clinical and economic impact of antimicrobial resistance. XXX. This tool is meant to provide researchers, policy makers and clinicians insights into the clinical and financial impacts antimicrobial resistance can have on healthcare systems around the world if not urgently addressed.

**8 The contents of this report, such as text, data, and/or graphs are for informational purposes only. Estimates shown in this report may be based on certain assumptions surrounding resistance rates, costs, and mortality rates where information was not available. The Calculator is strictly for estimating clinical outcomes and costs due to healthcare resource utilization.**

**Your Findings**

**Inputs**

|  |  |
| --- | --- |
| **Country:** United States | **Estimated number of unique infections:** 44 |
| **Currency:** United States - dollar ($) | **% true infections:** 70% |
| **Exchange rate:** 1 | **Total patients with infections:** 31 |
| **Population growth:** 1% | **% future resistance:** 50% |

# 123

**Organism Details**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Parameter** | **Value** | **Costs** |
| Klebsiella pneumoniae | |  | | --- | | Distribution | | Carbapenem-resistance | | ESBL producer resistance | | Other resistance | | Susceptible | | |  | | --- | | 6.1% | | 3.0% | | 11.0% | | 0.0% | |  | | |  | | --- | |  | | $13,938 | | $6,303 | | $0 | | $4,897 | |
| Escherichia coli | |  | | --- | | Distribution | | Carbapenem-resistance | | ESBL producer resistance | | Other resistance | | Susceptible | | |  | | --- | | 19.5% | | 0.0% | | 6.0% | | 0.0% | |  | | |  | | --- | |  | | $13,938 | | $6,303 | | $0 | | $4,897 | |
| Enterococcus faecium | |  | | --- | | Distribution | | Vancomycin-resistance | | Other resistance | | Susceptible | | |  | | --- | | 1.1% | | 68.0% | | 0.0% | |  | | |  | | --- | |  | | $34,954 | | $0 | | $8,610 | |
| Pseudomonas aeruginosa | |  | | --- | | Distribution | | Multi-drug resistant | | Other resistance | | Susceptible | | |  | | --- | | 9.0% | | 7.0% | | 0.0% | |  | | |  | | --- | |  | | $6,303 | | $0 | | $4,897 | |
| Staphylococcus aureus | |  | | --- | | Distribution | | Methicillin-resistance | | Vancomycin resistance | | Other resistance | | Susceptible | | |  | | --- | | 21.2% | | 45.0% | | 0.0% | | 0.0% | |  | | |  | | --- | |  | | $13,938 | | $0 | | $0 | | $8,610 | |
| Other organism | |  | | --- | | Distribution | | Carbapenem-resistance | | ESBL producer resistance | | Other resistance | | Susceptible | | |  | | --- | | 0.0% | | 0.0% | | 0.0% | | 0.0% | |  | | |  | | --- | |  | | $0 | | $0 | | $0 | | $0 | |

Note: Resistance rates were obtained from the Center for Disease Dynamics, Economics and Policy (CDDEP) wherever available unless otherwise adjusted manually.

# 123

**Results**



#### Current Scenario

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Total Patients With Infections |  | % With Resistant Infections |  |
|  | **18** |  | **22%** |  |
|  | Susceptible: 14 |  |  |  |
|  | Resistant: 4 |  |  |  |

#### Future Scenario

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Total Patients With Infections |  | % With Resistant Infections |  |
|  | **18** |  | **50%** |  |
|  | Susceptible: 9 |  |  |  |
|  | Resistant: 9 |  |  |  |



#### Current Scenario

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Total Costs of Infections (Annual) |  | Incremental Cost of Resistance |  |
|  | **$134,628** |  | **$23,304** |  |
|  | Susceptible: $80,038 |  |  |  |
|  | Resistant: $54,590 |  |  |  |

#### Future Scenario

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Total Costs of Infections (Annual) |  | Incremental Cost of Resistance |  |
|  | **$139,048** |  | **$26,612** |  |
|  | Susceptible: $67,462 |  |  |  |
|  | Resistant: $71,586 |  |  |  |

# 123

**Takeaways**

In your modeled scenario, you have **18** patients with infection(s) of which **4** are resistant. These infections cost **$134,628** today (cost of incremental resistance = **$23,304**). Assuming **50%** are resistant, your cost would be **$139,048**.

**Combatting AMR requires multifaceted actions**

AMR Competency: The requirement for healthcare workers to acquire, and utilize, best practices to prevent and combat AMR

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | **Infection Prevention and Control**  Preventing infection should be considered the first line of defense against AMR. Practices and procedures include utilizing comprehensive protocols for patient isolation, and cleaning and disinfection  **Surveillance and Reporting**  Coordinated collection, assimilation, and analysis of data are necessary to track high priority organisms and infections, provide early warning of infection outbreaks, and drive decision making  **Antibiotic Stewardship (AMS)**  Ensuring appropriate stewardship supports decreases in utilization of antimicrobial agents and costs, length of stay, and hospital standardized mortality in Medicare patients with certain infections |  |

# 123

**References**

Citations:

1. [WHO Competency Framework](https://apps.who.int/iris/bitstream/handle/10665/272766/WHO-HIS-HWF-AMR-2018.1-eng.pdf" \t "_blank) – WHO, 2018.

Infection Prevention and Control Citations:

1. [Basic Infection Control And Prevention Plan for Outpatient Oncology Settings](https://www.cdc.gov/hai/pdfs/guidelines/basic-infection-control-prevention-plan-2011.pdf" \t "_blank) – CDC, 2011.
2. [Boyce JM. Antimicrobial Resistance & Infection Control. 2016](https://aricjournal.biomedcentral.com/articles/10.1186/s13756-016-0111-x" \t "_blank)
3. [Weinstein RA. Emergency Infectious Disease. 2001.](https://pubmed.ncbi.nlm.nih.gov/11294703/" \t "_blank)

AMS Citations:

1. [ASHP Statement on the Pharmacist's Role in Antimicrobial Stewardship and Infection Prevention and Control. Am J Health Syst Pharm. 2010.](https://pubmed.ncbi.nlm.nih.gov/20237387/" \t "_blank)
2. [Waters, CD. Am J Health Syst Pharm. 2015](https://pubmed.ncbi.nlm.nih.gov/25736941/" \t "_blank)
3. [Yu, K, et al. American Journal of Health-System Pharmacy (AJHP). 2014](https://doi.org/10.2146/ajhp130612" \t "_blank)

# 123

Our commitment to combating AMR

BD commits to helping slow the spread of antibiotic resistance by improving awareness, surveillance, infection prevention and stewardship. We commit to:

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Improve awareness** by mobilizing the Antimicrobial Resistance Fighter Coalition | **Support surveillance and research** by collaborating in specific projects. Utilizing MedMinedTM data with the CDC to help better understand resistance in the U.S. and track regional differences in important resistant pathogens and antimicrobial use | **Advance infection prevention practices** by introducing innovative solutions to support infection control initiatives and deploying training programs in collaboration with international organizations and professional societies | **Help to extend the useful life of existing medications** through stewardship training and innovative integration of diagnostic testing, microbiology results and medication management workflows |

To learn more, please visit [amr.bd.com](https://amr.bd.com" \t "_blank)