

Summary: Economic and Hospital Impact of Antimicrobial Resistance (AMR)

Study Overview

A retrospective analysis conducted by Vital Transformation assessed the direct clinical and economic impact of AMR among hospitalized patients with **sepsis, hospital acquired pneumonia, and complicated urinary tract infection (cUTI)**, finding that the 20-year cost will be \$655 billion by the year 2045. The analysis used longitudinal electronic health records from Vanderbilt University Medical Center (2016–2024), covering a cohort of **50,189 patients**.

Vanderbilt’s catchment area reflects a broad section of the southern US, with a mix of urban and rural populations, making it unique in being demographically representative of the US at large: TN (84%), IN (4%), AL (2%), KY (1%), FL (1%), TX (1%), MO (1%), and rest inclusive of NC–MS–AK–(6%)

Key Findings

Measure	Finding
Total cohort	50,189 patients
AMR prevalence	13% (6,713 patients)
Additional hospital stay	4 days directly attributable to AMR per infection
Direct medical cost	\$21,453 per AMR infection in balanced cohort
Readmission rate	28% for AMR vs. 21% for non-AMR (+7 percentage points)
US annual AMR cost (2025)	\$31 billion in actual costs defined by ICD codes in cohort
Projected US annual cost (2045)	\$52 billion (base case)
20-year economic burden	\$655 billion NPV

Read the full study



Hospital Impact

AMR substantially increases resource utilization. Across the three infections studied, AMR is associated with longer hospital stays, higher costs, and increased readmissions. Hospital stay accounts for approximately **83% of total hospital costs** for AMR patients. The study estimates that AMR-related infections currently consume approximately **2 million hospital bed-days annually in the US**, potentially increasing to **3.5 million days by 2045**.

Clinical Burden

Mortality remains substantial across all indications:

- **Sepsis:** ~34% mortality
- **Hospital Acquired Pneumonia:** ~33% mortality
- **cUTI:** ~24% mortality

A significant proportion of deaths occur within the first two weeks of infection, highlighting the importance of early and effective treatment.

Also, AMR increases hospital readmission rates associated with these infections by about 1/3 (33%) compared to non-AMR infections. This means that Hospital Readmission Rates increase by roughly 7%-points due to AMR alone.

Implications

AMR represents a growing threat to hospital capacity and healthcare economics. AMR incidence is increasing faster than both population growth and overall infection rates. Without effective interventions and innovative antimicrobial treatments, the US healthcare system could face significant additional capacity requirements and hundreds of billions of dollars in cumulative costs over the next 20 years. The findings suggest a substantial potential economic return for investments in new antimicrobial therapies that reduce AMR-related hospital utilization and costs.

AMR is not only a major clinical challenge — it is a significant and growing driver of hospital costs, bed utilization, and readmissions, strengthening the case for investment in innovative antimicrobial solutions.

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