Mortality Rates among Patients Infected with Carbapenem-resistant *Acinetobacter baumannii* Complex (CRAB), Tennessee, 2014–2024.

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Background

- Carbapenem-resistant *Acinetobacter baumannii* Complex (CRAB) is associated with severe infections and high death rates.
- The 2024 Bacterial Priority Pathogens List published by the World Health Organization indicates CRAB to be a critical priority.
- As part of the Emerging Infections Program (EIP), Tennessee participates in the population-based CRAB surveillance in Davidson and seven other surrounding counties since 2014.
- This study attempts to describe the 30-day and 90-day mortality following date of specimen collection, and factors associated with higher death rate related to CRAB infections.

Methods

- A case was defined as a patient with *Acinetobacter baumannii* complex isolated from normally sterile sites, urine, lower respiratory tract specimens or wound specimens resistant to meropenem, imipenem or doripenem from the surveillance area.
- CRAB cases from 2014 to 2024 were included.
- Epidemiologic and clinical data were collected through the Multi-site Gram-Negative Surveillance Initiative's (MuGSI).
- Logistic regression was used to calculate adjusted odds ratios controlling for variables considered to be associated with mortality.
- Data analysis was performed using SAS 9.4.

Results

- 249 cases of CRAB infections were reported from 2014 to 2024.
- Age of cases ranged from 22 to 93 years with a mean age of 60.9 years.
- A higher proportion of cases (90.8%) had prior healthcare exposure.
- The most common specimen source was urine which made up of 38.7% of isolates, followed by wound, sputum and blood which made up of 24.2%, 12.9% and 12.1% of all cases, respectively.
- Of specimen from normally sterile sites, blood specimens made 66.7% of specimens.
- Exposure to healthcare settings was not significantly associated with 30-day nor 90-day mortality ($P > 0.35$).
- Thirty-eight (15.3%) cases died within 30 days, and 62 (24.9%) cases died within 90 days after the date of specimen collection. (Figure 1)
- Age was associated with 30-day mortality (Table 1), whereas age and specimen source were associated with 90-day mortality (Table 2).

Figure 1: Distribution of Deaths by Demography and Specimen Source

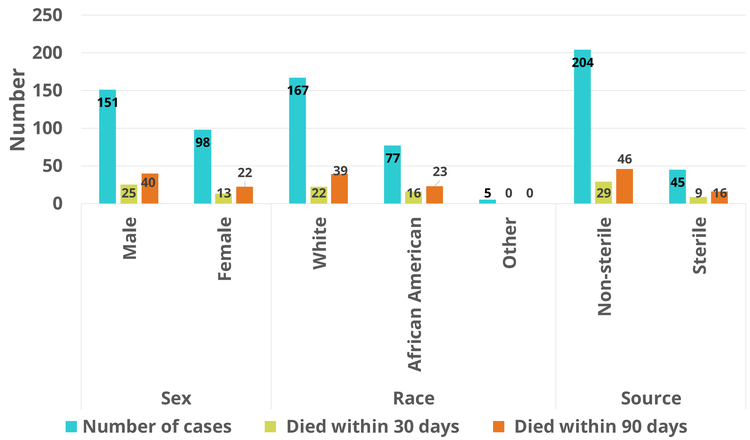


Table 1: 30-day Mortality of CRAB Cases by Demography and Specimen Source

Variable	Odds Ratio	95% Confidence Interval	P-value
Sex (Female vs Males)	0.73	0.35–1.56	0.41
Race (African American vs White)	1.65	0.99–2.45	0.09
Age in years	1.02	1.01–1.48	0.04
Sterile vs Non-sterile	1.66	0.71–3.96	0.25

Table 2: 90-day Mortality of CRAB Cases by Demography and Specimen Source

Variable	Odds Ratio	95% Confidence Interval	P-value
Sex (Female vs Males)	0.76	0.40–1.42	0.39
Race (African American vs White)	1.40	0.71–2.58	0.35
Age in years	1.03	1.01–1.55	0.03
Sterile vs Non-sterile	2.40	1.13–4.90	0.02

Conclusion

- In this study, older patients had a significantly higher risk of dying in 30 days and 90 days following CRAB isolation.
- African Americans may have an increased risk of dying within 30 days after specimen collection.
- The risk of dying within 90 days was much higher for invasive infections from a sterile source.
- There was no significant difference in death rate between males and females. However, males make up more than 60% of the cases and further study is warranted to explain why the males are at increased risk of acquiring CRAB infection.
- Understanding the risk factors associated with higher mortality is important to improve clinical outcomes among patients infected with CRAB.

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