

A Seven-Year Analysis of CRAB and CRE Urinary Tract Infections in Tennessee

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Background

- Urinary tract infections (UTIs) are a widespread health issue impacting millions globally.
- The study aimed to assess demographics, prevalence, and clinical characteristics of patients with UTIs caused by Carbapenem-Resistant *Acinetobacter baumannii* complex (CRAB) and Carbapenem-Resistant *Enterobacteriales* (CRE).
- The research provides insights into the differences in UTIs caused by these two types of resistant bacteria.
- Data from the Tennessee Multi-site Gram-negative Surveillance Initiative (MuGSI) was used for a comparative study on UTIs caused by CRAB and CRE.

Figure 1: CRAB & CRE cases in 2016–2022

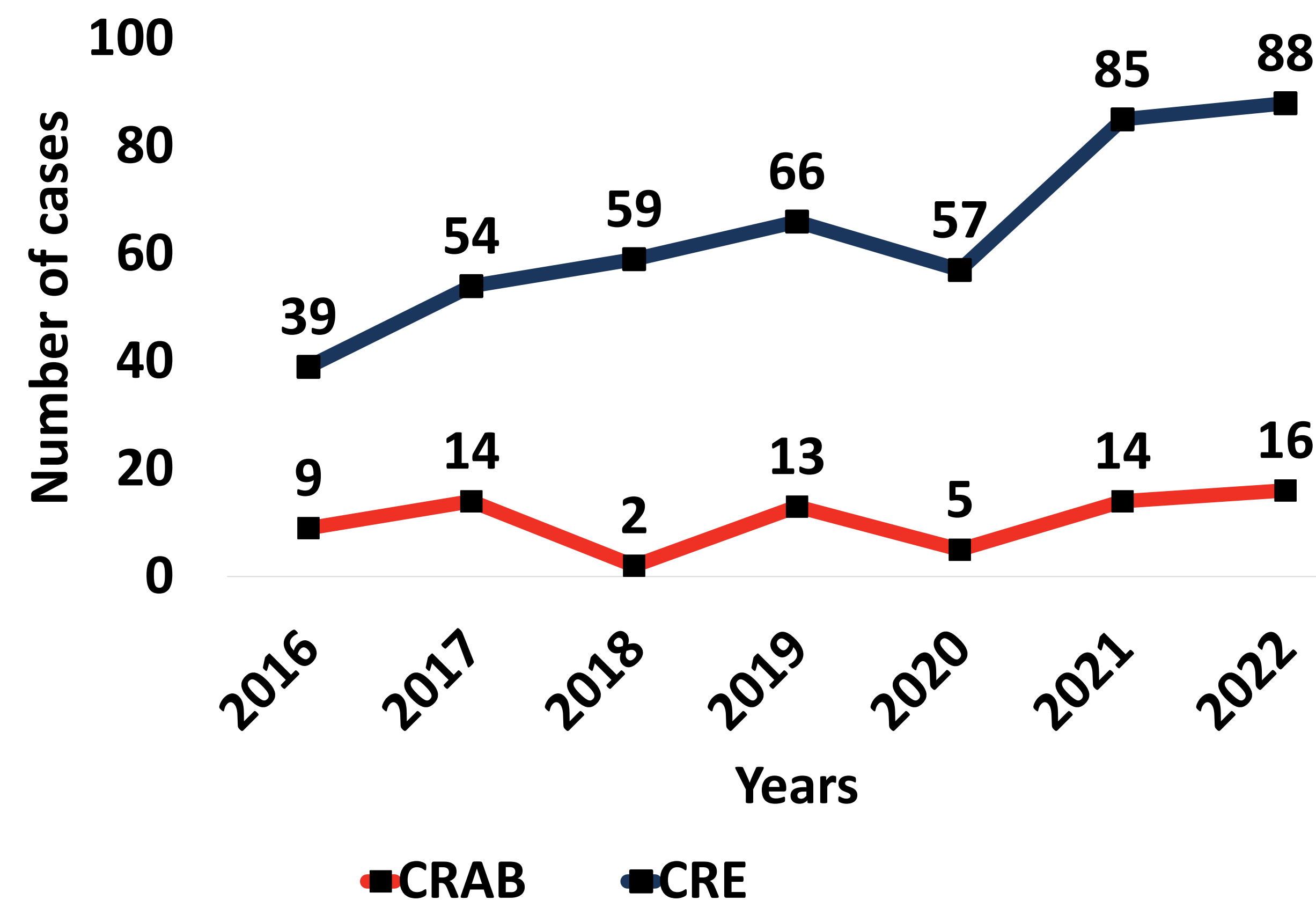
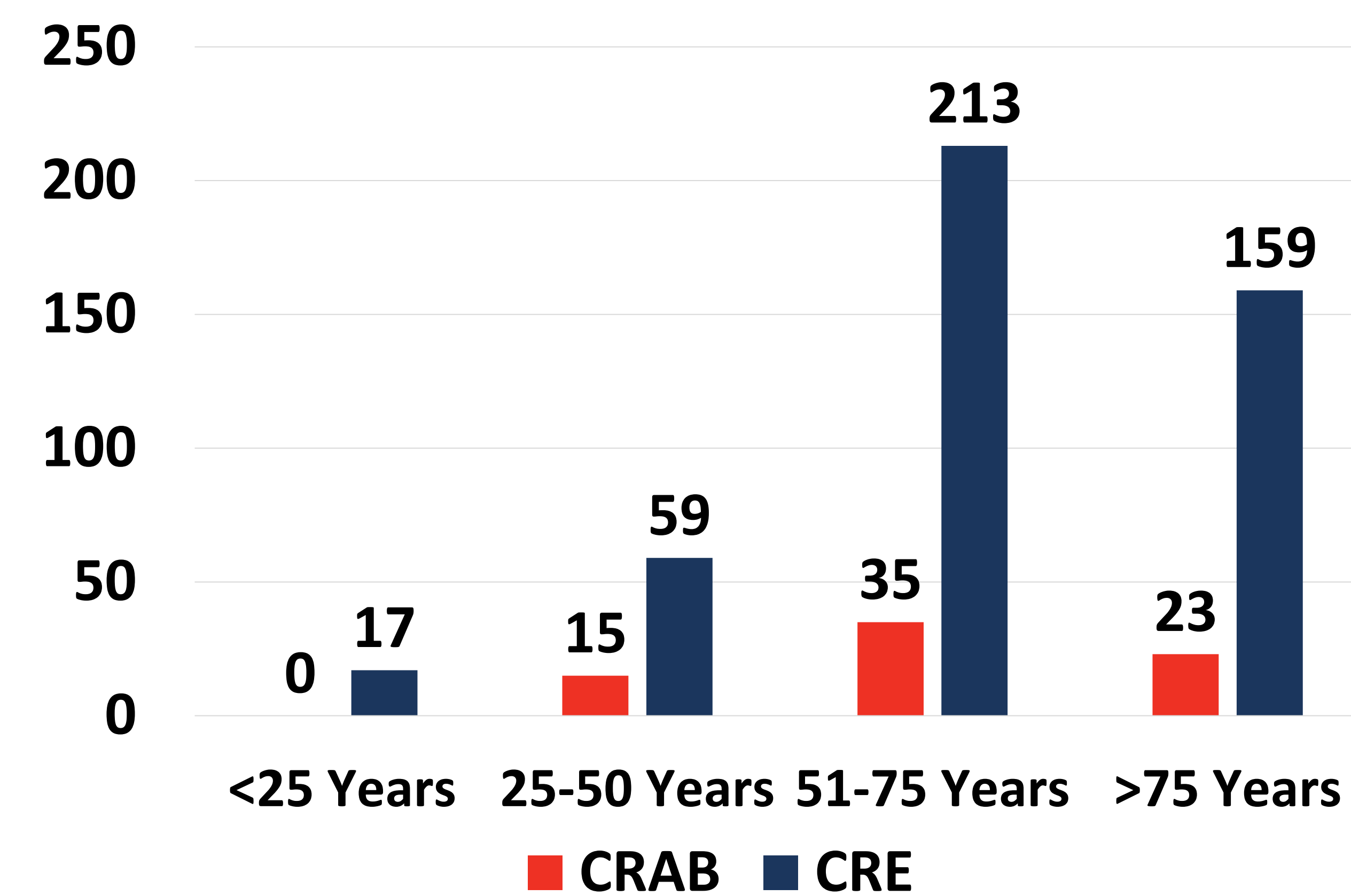


Figure 2: Age groups of CRAB & CRE cases



Results

- **73 CRAB and 448 CRE cases with UTIs** were reported from 2016–2022 (Figure 1).
- Mean ages for CRAB and CRE cases are 64 and 67 years, respectively.
- **Incidence rate** of CRAB was higher in non-white populations (8.59 per 100,000) compared to white populations (3.27 per 100,000) ($p < 0.0001$).
- 98.6% of CRAB and 67.2% of CRE cases were healthcare-associated infections.
- **CRAB mortality** was **6.9%** compared to CRE at 2.0% ($p = 0.0178$).

Methods

- We analyzed the CRE and CRAB incident cases reported to the MuGSI project from 2016–2022. Case definitions are as follows:
- **CRE case** “the isolation of *Escherichia coli*, *Enterobacter* species and *Klebsiella* species from normally sterile site or urine, and resistant to ≥ 1 carbapenem.”
- **CRAB case** “the isolation of Carbapenem-resistant *A. baumannii* complex from a normally sterile site or urine (2016-2020). In 2021, lower respiratory tract and wound cultures were added.”
- **Incident case** “report of the first case in 30 days.”

Figure 3: Sex and race of CRAB & CRE cases

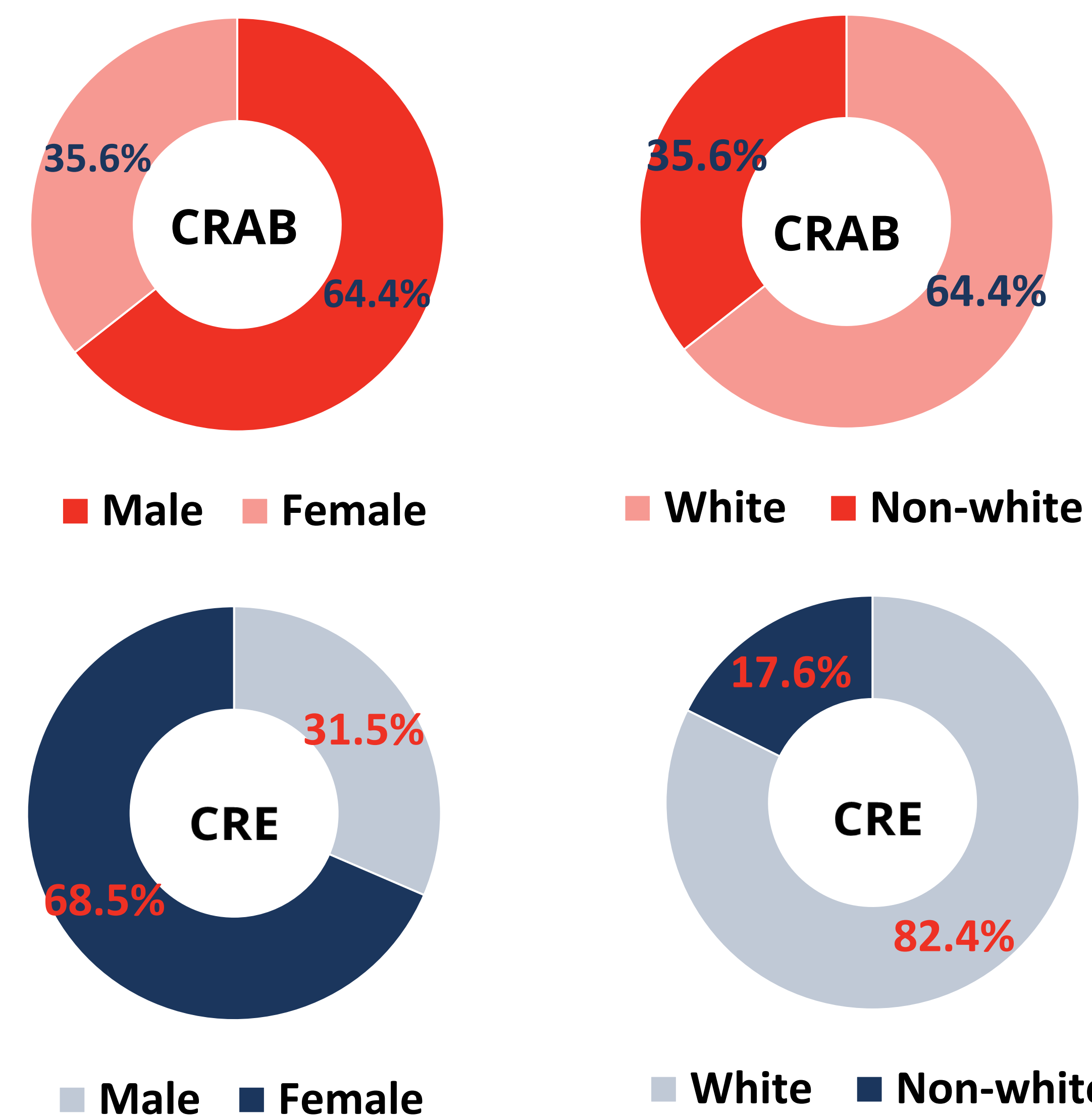


Table 1: Clinical conditions of CRAB & CRE

Clinical conditions	CRAB	CRE	p Value
Admitted in Intensive Care Unit	23.3%	10.5%	<0.0020*
Urinary catheter	68.5%	27.5%	<0.0001*
Smoker	16.4%	16.1%	0.9370
Alcohol	4.1%	4.0%	0.9705
Diabetes	47.9%	35.5%	<0.0412*
Heart conditions	49.3%	38.8%	0.0906
Neurological conditions	67.1%	37.3%	<0.0001*
Renal conditions	42.5%	24.6%	0.0014*
Obesity	26.0%	22.8%	0.5408

Conclusion

- This study is the first multi-year evaluation of TN patients with CRE and CRAB UTIs.
- **CRAB patients frequently required ICU admission and often had indwelling catheters, neurological and renal conditions, and diabetes.**
- The link between ICU patient severity and CRAB infection needs further investigation.
- Significant race and sex disparities were observed between CRAB and CRE-infected patients, warranting additional research.

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