Emerging Infections Program Network Report
Healthcare-Associated Infection Community Interface Multi-site Gram-negative Surveillance Initiative Carbapenem-Resistant *Acinetobacter baumannii* Complex (CRAB) Surveillance, 2015

EIP Areas:
Colorado (5 county Denver area); Georgia (8 county Atlanta area); Maryland (4 county Baltimore area); Minnesota (2 county Minneapolis-Saint Paul area); New Mexico (1 county Albuquerque area); New York (1 county Rochester area); Oregon (3 county Portland area); and Tennessee (8 county Nashville area).

Population:
The surveillance areas represent 15,226,087 persons.
Source: National Center for Health Statistics bridged-race vintage 2015 file.

Case Definition:
A carbapenem-resistant *Acinetobacter baumannii-calcoaceticus* complex (CRAB) case was included in this report if there was isolation of *Acinetobacter* that is part of the *A. baumannii-calcoaceticus* complex meeting the following criteria:

- Carbapenem-resistant (doripenem [using FDA criteria], imipenem, meropenem) using the current Clinical and Laboratory Standards Institute (CLSI) clinical breakpoints (1);
- Isolated from either a normally sterile site (e.g., blood, cerebrospinal fluid, pleural fluid, pericardial fluid, peritoneal fluid, joint/synovial fluid, bone, internal body site, muscle) or urine;
- Identified in residents of the surveillance area in 2015.

Methodology:
Case finding was active, laboratory-based, and population-based. Clinical laboratories that serve residents of the surveillance area were routinely contacted for case identification through a query of minimum inhibitory concentration (MIC) values from automated testing instruments. When possible, the MIC values obtained directly from the automated testing instruments were used to determine if an isolate met the phenotypic case definition. An incident CRAB case was defined as the first CRAB isolate meeting the case definition from a patient during a 30-day period.

A standardized case report form was completed for each incident case through review of medical records. Inpatient and outpatient medical records were reviewed for information on patient demographics, clinical syndrome, outcome of illness, and relevant healthcare exposures.

Isolates were not collected as part of this activity in 2015.

Incidence rates for CRAB cases were calculated using the 2015 US Census estimates of the surveillance area population as the denominator. Cases with unknown race (1.8% in 2015) were assigned race based on distribution of known age, race and gender by EIP site. Assessment of vital status in patients admitted to a hospital occurred at the time of discharge from the acute care hospital. For patients in a long-term care facility, long-term acute care facility, or in an outpatient dialysis center, vital status was assessed 30 days after culture collection. For all other patients, vital status was assessed using medical records from the healthcare facility encounter associated with the culture.

CRAB surveillance data underwent regular data cleaning to ensure accuracy and completeness. Patients with complete case report form data as of 4/9/2021 were included in this analysis. Because data can be updated as needed, analyses of datasets generated on a different date may yield slightly different results.

Results:

Table 1: Incidence Rates of CRAB Cases by Sex, Race and Age (n=167), 2015[a]

Sex	**Incidence Rate/100,000 Population**	**95% CI**
Female	0.72	0.69, 0.74
Male	1.50	1.47, 1.52

Race	**Incidence Rate/100,000 Population**	**95% CI**
White	0.67	0.65, 0.69
Black or African American	2.70	2.64, 2.76
Other[b]	0.42	0.28, 0.62

Age groups, years	**Incidence Rate/100,000 Population**	**95% CI**
0-49	0.90	0.90, 0.90
50-64	1.79	1.79, 1.79
65-79	2.44	2.44, 2.44
≥80	4.37	4.37, 4.37
Invasive cases[c]	0.30	0.29, 0.32
All cases	1.10	1.08, 1.11

[a]The number of cases is not included because of small numbers.
[b]Other race includes Asian, American Indian or Alaska Native.
[c]Invasive cases include cases with a sterile incident specimen source or an incident urine specimen with a subsequent non-incident sterile specimen collected on the date of incident specimen collection or in the 29 days after.

Table 2. Clinical Characteristics and Infection Types for Incident CRAB Cases (N=167), 2015[a]

No. of Immunocompromised[b] Cases	**%**
7	4.2

Infection types	No. of Cases	%
Urinary tract infection[c]	98	58.7
Bacteremia[d]	44	26.3
Septic shock	18	10.8
Pneumonia	9	5.4
Chronic or decubitus skin ulcer	6	3.6
Other infection types	21	12.6
None[e]	16	9.6
Unknown	9	5.4

[a]Patients could have more than one type of infection reported.
[b]Immunocompromised includes solid organ transplant recipients and patients with a documented diagnosis of AIDS or a hematologic malignancy.
[c]Among 98 cases with a documented urinary tract infection (UTI), 46 (46.9%) had signs and symptoms associated with a UTI documented in the medical record. Reported signs and symptoms included fever, dysuria, frequency, urgency, costovertebral angle pain or tenderness, and suprapubic tenderness.
[d]Bacteremia includes cases with a positive blood specimen (incident or non-incident) or a documented diagnosis of sepsis, septicemia, bacteremia, or blood stream infection.
[e]No infection types reported.

Table 3. Patient Location Before, During, and After Incident Specimen Collection Among Incident CRAB Cases (N=167), 2015

Residence before incident specimen collection	No. of Cases	%
Long-term care facility	77	46.1
Private residence	49	29.3
Acute care hospital (inpatient)	29	17.4
Long-term acute care hospital	11	6.6
Unknown	1	0.6

Collection location	No. of Cases	%
Outpatient setting or emergency department	76	45.5
Acute care hospital	55	32.9
Long-term care facility	29	17.4
Long-term acute care hospital	7	4.2

Hospitalized on the day of or in the 29 days after the date of incident specimen collection	No. of Cases	%
Hospitalized	125	74.9
Not hospitalized	41	24.6
Unknown	1	0.6

Discharge location among hospitalized patients (N=125)	No. of Cases	%
Long-term care facility	55	44.0
Private residence	37	29.6
Died during hospitalization	19	15.2
Long-term acute care hospital	12	9.6
Unknown	2	1.6

Table 4. Outcome of CRAB Cases (N=167), 2015

Outcome	No. of Cases	%
ICU admission in the 6 days after the date of incident specimen collection	42	25.1
Died	24	14.4
Cases with a positive incident sterile site specimen (N=46)	14	30.4
Cases with a positive incident urine specimen (N=121)	10[a]	8.3

[a]One case had a subsequent non-incident blood specimen collected on the date of incident specimen collection or in the 29 days after.

Table 5. Selected Characteristics of Incident CRAB Cases (N=167), 2015[a]

Healthcare facility stay in the year before the date of incident specimen collection	No. of Cases	%
Acute care hospital	138	82.6
Long-term care facility	107	64.1
Long-term acute care hospital	23	13.8

Exposure	No. of Cases	%
Surgery in the year before the date of incident specimen collection	55	32.9
In ICU in the 7 days before the date of incident specimen collection	14	8.4
Specimen collected ≥3 days after hospital admission	30	18.0
Chronic dialysis	12	7.2
Selected medical device(s) in place in the 2 calendar days before the date of incident specimen collection	136	81.4
Urinary catheter	114	68.3
Central venous catheter	55	32.9
Other[b]	58	34.7

[a]Patients could have more than one prior healthcare risk factor reported.
[b]Other medical devices include endotracheal or nasotracheal tube, tracheostomy, gastrostomy tube, nephrostomy tube, nasogastric tube.

Summary:

In 2015, 167 incident cases of CRAB were identified, representing 150 unique case-patients. The overall crude incidence rate of CRAB was 1.10 cases per 100,000 persons, with higher incidence in men than women, and higher incidence in persons of Black or African American race compared to other races. The incidence rate of CRAB increased with age.

Urinary tract infections were the most common infection type reported. Isolates were most commonly collected while a patient was in an outpatient setting or emergency department, and patients were most commonly located in the long-term care setting prior to their incident specimen collection.

Most cases required hospitalization with 25% requiring ICU admission. Overall, crude mortality was 14%, and higher in patients who had their CRAB isolates from a sterile site compared to a patient with a urine culture.

Prior healthcare exposures were reported in all but 2% of cases, with hospitalization in the prior year, presence of an indwelling medical device, and prior long-term care facility residency being the most common exposures.

References:

1. Clinical and Laboratory Standards Institute. Performance standards for antimicrobial susceptiblity testing: twenty-fifth informational supplement. M100-S25. Wayne (PA): The Institute; 2015.

Citation:

Centers for Disease Control and Prevention. 2022. Emerging Infections Program, Healthcare-Associated Infections – Community Interface Carbapenem-Resistant Acinetobacter baumannii Complex (CRAB) Surveillance Report, Multi-site Gram-negative Surveillance Initiative (MuGSI), 2015. Available at: https://www.cdc.gov/hai/eip/pdf/mugsi/2015-CRAB-Report-508.pdf