

Emerging Infections Program (EIP) Network Report Healthcare-Associated Infection Community Interface Multi-site Gram-negative Surveillance Initiative Carbapenem-Resistant *Acinetobacter baumannii* Complex (CRAB) Surveillance, 2016

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 area represents 15,370,591 persons.

Source: National Center for Health Statistics bridged-race vintage 2016 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 2016.

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 2016.

Incidence rates for CRAB cases were calculated using the 2016 US Census estimates of the surveillance area population as the denominator. Cases with unknown race (6.0% in 2016) 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=117), 2016^a

Sex	Incidence Rate/100,000 Population	95% CI
Female	0.39	0.37, 0.42
Male	1.15	1.12, 1.17

Race	Incidence Rate/100,000 Population	95% CI
White	0.37	0.35, 0.39)
Black or African American	2.20	2.15, 2.26
Other ^a	0.16	0.06, 0.44

Age groups, years	Incidence Rate/100,000 Population	95% CI
0-49	0.59	0.59, 0.59
50-64	0.99	0.99, 0.99
65-79	2.40	2.40, 2.40
≥80	2.58	2.60, 2.60
Invasive cases ^b	0.16	0.15, 0.18
All cases	0.76	0.75, 0.77

^aThe number of cases is not included because of small numbers.

^bOther race includes Asian, American Indian or Alaska Native.

^cInvasive 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=117), 2016^a

No. of Immunocompromised ^b Cases	%
6	5.1

Infection types	No. of Cases	%
Urinary tract infection ^c	56	47.9
Bacteremia or septic shock ^d	28	23.9
Pneumonia	6	5.1
Other infection types	11	9.4
None ^e	24	20.5
Unknown	12	10.3

^aPatients could have more than one type of infection reported.

^bImmunocompromised includes solid organ transplant recipients and patients with a documented diagnosis of AIDS or a hematologic malignancy.

^cAmong 56 cases with a documented urinary tract infection (UTI), 19 (33.9%) 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.

^dBacteremia includes case with a positive blood specimen (incident or non-incident) or a documented diagnosis of sepsis, septicemia, bacteremia, or blood stream infection.

^eNo infection types reported.

Table 3. Patient Location Before, During, and After Incident Specimen Collection Among Incident CRAB Cases (N=117), 2016

Residence before incident specimen collection	No. of Cases	%
Long-term care facility	49	41.9
Private residence	35	29.9
Acute care or long-term acute care hospital inpatient	29	24.8
Unknown	4	3.4

Collection location	No. of Cases	%
Outpatient setting or emergency department	48	41.0
Acute care or long-term acute care hospital	40	34.2
Long-term care facility	29	24.8

Hospitalized on the day of or in the 29 days after the date of incident specimen collection	No. of Cases	%
Hospitalized	79	67.5
Not hospitalized	35	29.9
Unknown	3	2.6

Discharge location among hospitalized patients (N=79)	No. of Cases	%
Long-term care facility	44	55.7
Private residence or other discharge location ^a	24	30.4
Died during hospitalization	10	12.7
Unknown	1	1.3

Table 4. Outcome of CRAB Cases (N=117), 2016

Outcome	No. of Cases	%
ICU admission in the 6 days after the date of incident specimen collection	20	17.1
Died ^a	11	9.4

^aA break down of sterile vs. urine sites among patients who died is not reported due to small numbers.

Table 5. Selected Characteristics of Incident CRAB Cases (N=117), 2016

Healthcare facility stay in the year before the date of incident specimen collection	No. of Cases	%
Acute care hospital	103	88.0
Long-term care facility	70	59.8
Long-term acute care hospital	7	6.0

Exposure	No. of Cases	%
Surgery in the year before the date of incident specimen collection	38	32.5
In ICU in the 7 days before the date of incident specimen collection	7	6.0
Specimen collected ≥ 3 days after hospital admission	24	20.5
Chronic dialysis	10	8.6
Selected medical devices in place in the 2 calendar days before the date of incident specimen collection	81	69.2
Urinary catheter	68	58.1
Central venous catheter	39	33.3
Other ^a	37	31.6

^aOther medical devices include endotracheal or nasotracheal tube, tracheostomy, gastrostomy tube, nephrostomy tube, nasogastric tube.

Summary:

In 2016, 117 incident cases of CRAB were identified, representing 114 unique case-patients. The overall crude incidence rate of CRAB was 0.76 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 17% requiring ICU admission. Overall, crude mortality was 9%, and higher in patients who had their CRAB isolates from a sterile site compared to a patient with a urine culture (numbers not shown because of small cell size).

Prior healthcare exposures were reported in all but 1% 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 susceptibility testing: twenty-sixth informational supplement. M100-S26. Wayne (PA): The Institute; 2016.

Citation:

Centers for Disease Control and Prevention. Emerging Infections Program, Healthcare-Associated Infections – Community Interface Carbapenem-Resistant *Acinetobacter baumannii* Complex (CRAB)

Surveillance Report, Multi-site Gram-negative Surveillance Initiative (MuGSI), 2016. Posted online on October 4, 2022. Available at: <https://www.cdc.gov/hai/eip/pdf/mugsi/2016-CRAB-Report-508.pdf>.