

Emerging Infections Program (EIP) Network Report
Healthcare-Associated Infection Community Interface Activity
Multi-site Gram-negative Surveillance Initiative
Carbapenem-Resistant *Acinetobacter baumannii* Complex Surveillance, 2018

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 a normally sterile body 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 2018.

Surveillance Catchment Areas:

Colorado (5 county Denver area); Connecticut (Statewide); Georgia (8 county Atlanta area); Maryland (4 county Baltimore area); Minnesota (2 county Minneapolis – St. 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 19,222,539 persons.
Source: National Center for Health Statistics bridged-race vintage 2018 file.

Methods:

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 for 2018.

Incidence rates for incident CRAB cases were calculated using the 2018 US Census estimates of the surveillance area population as the denominator. 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 2/2/2022 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. Specimen Sources for CRAB Cases by Organism, 2018 (N=121)

Organism	Total	Urine No.	Urine %	Blood ^a No	Blood %	Other Sterile Sites No.	Other Sterile Sites %
<i>Acinetobacter baumannii-calcoaceticus</i> complex ^b	121	80	66.1	37	30.6	4	3.3

^a Category includes cases with both a positive blood and urine specimen collected

^b Unable to distinguish between species in *Acinetobacter baumannii-calcoaceticus* complex

Table 2: Incidence Rates of CRAB Cases by Sex, Race and Age, 2018 (N=121)

Sex	No. of Cases	%	Incidence Rate ^a
Female	31	25.6	0.36
Male	90	74.4	0.96

Race ^b	No. of Cases	%	Incidence Rate ^a
White	50	41.3	0.36
Black or African American	61	50.4	1.54
Other ^c	3	2.5	0.20
Unknown	7	5.8	-

Age groups, years	No. of Cases	%	Incidence Rate ^a
0–49	28	23.1	0.22
50–64	37	30.6	1.00
65–79	38	31.4	1.82
≥80	18	14.9	2.81
Invasive cases^d	42	34.7	0.22
All cases	121	100.0	0.63

^a Cases per 100,000 population for EIP areas (crude rates)

^b Other race includes Asian, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, or ≥2 races reported

^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 3. CRAB Cases by Race and Ethnicity, 2018 (N=121)

Characteristics	No. of Cases	%
Hispanic, any race	5	4.1
Not known to be Hispanic ^a – White ^b	46	38.0
Not known to be Hispanic ^a – Black or African American ^c	61	50.4
Not known to be Hispanic ^a – Asian ^d	2	1.7
Not known to be Hispanic – Other or multiple races	1	0.8
Not known to be Hispanic ^a – Unknown race	6	5.0

^a Records either indicated ethnicity was non-Hispanic, or ethnicity was not known

^b 5 CRAB cases with unknown ethnicity

^c 11 CRAB cases with unknown ethnicity

Table 4. Selected Characteristics of CRAB Cases, 2018 (N=121)

Location of patient on the 3 rd calendar day before incident specimen collection	No. of Cases	%
Long-term care facility/ long-term acute care hospital	55	45.5
Private residence or other location	40	33.1
Acute-care hospital (inpatient)	23	19.0
Unknown	3	2.5

Location of incident specimen collection	No. of Cases	%
Outpatient setting or emergency department	53	43.8
Acute care hospital	39	32.2
Long-term care facility/ long-term acute care hospital	29	24.0

Infection types ^a	No. of Cases	%
Urinary tract infection	59	48.8
Bacteremia ^b	42	34.7
Septic shock	9	7.4
Other	12	9.9
None ^c	15	12.4
Unknown	4	3.3

^a Patients could have more than one type of infection reported

^b Bacteremia includes cases with a positive blood specimen (incident or non-incident) or a documented diagnosis of sepsis, septicemia, bacteremia, or blood stream infection

^c No infection types reported

Table 5. Selected Clinical Characteristics of CRAB Cases, 2018^a (N=121)

Charlson comorbidity index	No. of Cases	%
0	13	10.7
1	16	13.2
≥2	90	74.4
Unknown	2	1.7
Median (IQR)	3	2–4

Underlying conditions	No. of Cases	%
Skin condition	73	60.3
Neurologic condition, any	55	45.5
Diabetes mellitus	51	42.1
Cardiovascular disease ^b	48	39.7
Urinary tract problems/abnormalities	46	38.0
Chronic pulmonary disease ^c	36	29.8
Malignancy (hematologic or solid organ)	23	19.0
Chronic renal disease	17	14.0
Gastrointestinal disease ^d	11	9.1
Transplant (solid organ)	1	0.8
Unknown	2	1.7

^a Patients could have more than one underlying condition reported

^b Defined as myocardial infarction, congestive heart failure, congenital heart disease, stroke, transient ischemic attack, or peripheral vascular disease

^c Defined as cystic fibrosis or any chronic respiratory condition resulting in symptomatic dyspnea

^d Defined as peptic ulcer disease or liver disease

Table 6. Selected Healthcare Exposures or Risk Factors of CRAB Cases, 2018^a (N=121)

Healthcare facility stay in the year before the date of incident specimen collection	No. of Cases	%
Acute care hospitalization	101	83.5
Long-term care facility residence	82	67.8
Long-term acute care hospitalization	7	5.8

Exposure	No. of Cases	%
Surgery in the year before the date of incident specimen collection	41	33.9
Specimen collected ≥3 days after hospital admission	22	18.2
Chronic dialysis	12	9.9
Surgery in the year before the date of incident specimen collection	41	33.9

Selected medical device(s) in place in the 2 calendar days before the date of incident specimen collection	No. of Cases	%
Urinary catheter	73	60.3
Central venous catheter	42	34.7
Other ^b	44	36.4

^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

Table 7. Outcomes of Incident CRAB Cases, 2018 (N=121)

Outcomes	No. of Cases	%
Hospitalized on the day of or in the 29 days after the date of incident specimen collection	86	71.1
ICU admission in the 6 days after the date of incident specimen collection	24	19.8

Discharge location among hospitalized	No. of Cases	%
Private Residence or other discharge location	27/86	31.4
Long-term care facility	43/86	50.0
Died during hospitalization	16/86	18.6
Died within 30 days of incident specimen collection date	17	14.0
Cases with an incident sterile site specimen	13/41	31.7
Cases with an incident urine specimen	4/80	5.0

Summary:

Surveillance data from 2018 represent the seventh full year of population-based surveillance for CRAB through the Emerging Infections Program. The overall crude incidence rate of CRAB in 2018 was 0.63 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. Underlying conditions were commonly reported, with most CRAB cases having a Charlson comorbidity index of ≥ 2 . Most cases required hospitalization with 19.8% requiring ICU admission. Overall, crude mortality was 14.1 %, and higher in patients who had CRAB isolated from a sterile site compared to those with CRAB isolated from urine.

The most common prior healthcare exposures reported included hospitalization in the prior year, presence of an indwelling medical device, and prior long-term care facility residency.

References:

1. Clinical and Laboratory Standards Institute (CLSI). Performance Standards for Antimicrobial Susceptibility Testing. 28th ed. CLSI supplement M100 (ISBN 1-56238-838-X). Clinical and Laboratory Standards Institute, 950 West Valley Road, Suite 2500, Wayne, Pennsylvania 19087 USA, 2018.

Citation:

Centers for Disease Control and Prevention. 2023. Emerging Infections Program, Healthcare-Associated Infections – Community Interface Surveillance Report, Multi-site Gram-negative Surveillance Initiative (MuGSI), Carbapenem-Resistant *Acinetobacter baumannii* Complex Surveillance, 2018. Available at: <https://www.cdc.gov/hai/eip/pdf/mugsi/2018-CRAB-Report-508.pdf>

For more information, visit our web sites:

- Multi-site Gram-negative Surveillance Initiative (MuGSI) (<https://www.cdc.gov/hai/eip/mugsi.html>)
- Healthcare-Associated Infections - Community Interface Data Visualization (<https://www.cdc.gov/hai/eip/haicviz.html>)