Emerging Infections Program (EIP) Network Report
Healthcare-Associated Infection Community Interface Activity
Multi-site Gram-negative Surveillance Initiative
Carbapenem-Resistant Acinetobacter baumannii Complex Surveillance, 2017

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 2017.

Surveillance Catchment Areas:

Colorado (5 county Denver area); 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 15,543,478 persons.
Source: National Center for Health Statistics bridged-race vintage 2017 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 2017.

Incidence rates for incident CRAB cases were calculated using the 2017 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 9/10/2021 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. Specimen Sources for CRAB Cases by Organism, 2017 (N=124)

Organism	Total	Urine No.	Urine %	Blood[a] No.	Blood %	Other Sterile Sites No.	Other Sterile Sites %
Acinetobacter baumannii-calcoaceticus complex[b]	124	77	62.1	43	34.7	4	3.2

[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, 2017 (N=124)

Sex	No. of Cases	%	Incidence Rate[a]
Female	49	39.5	0.62
Male	75	60.5	0.99

Race	No. of Cases	%	Incidence Rate[a]
White	43	34.7	0.40
Black or African American	72	58.1	2.07
Other[b]	2	1.6	0.16
Unknown	7	5.6	-

Age groups, years	No. of Cases	%	Incidence Rate[a]
0–49	26	21	0.25
50–64	34	27.4	1.16
65–79	52	41.9	3.30
≥80	12	9.7	2.57
Invasive cases[c]	47	37.9	0.30
All cases	124	100	0.80

[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, 2017 (N=124)

Race/Ethnicity	No. of Cases	%
Hispanic, any race	1	0.8
Not known to be Hispanic[a] – White[b]	43	34.7
Not known to be Hispanic[a] – Black or African American[c]	72	58.1
Not known to be Hispanic[a] – Asian[d]	2	1.6
Not known to be Hispanic[a] – Unknown race[e]	6	4.8

[a] Records either indicated ethnicity was non-Hispanic, or ethnicity was not known
[b] 10 CRAB cases with unknown ethnicity
[c] 9 CRAB cases with unknown ethnicity
[d] 2 CRAB cases with unknown ethnicity
[e] Of cases with unknown race, 5 CRAB cases had unknown ethnicity

Table 4. Selected Characteristics of CRAB Cases, 2017 (N=124)

Location of patient on the 3rd calendar day before incident specimen collection	No. of Cases	%
Long-term care facility	45	36.3
Private residence	36	29.0
Acute-care hospital (inpatient)	33	26.6
Long-term acute care hospital	5	4.0
Unknown	5	4.0

Location of incident specimen collection	No. of Cases	%
Outpatient setting or emergency department	54	43.5
Acute care hospital	49	39.5
Long-term care facility/long-term acute care hospital	21	16.9

Infection types[a]	No. of Cases	%
Urinary tract infection	54	43.5
Bacteremia[b]	44	35.5
Septic shock	13	10.5
Other	12	9.7
None[c]	14	11.3
Unknown	8	6.5

[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, 2017[a] (N=124)

Charlson comorbidity index	No. of Cases	%
0	10	8.1
1	23	18.5
≥2	86	69.4
Unknown	5	4.0
Median (IQR)	3	1–4

Underlying conditions	No. of Cases	%
Skin condition	69	55.6
Cardiovascular disease[b]	54	43.5
Diabetes mellitus	50	40.3
Neurologic condition, any	49	39.5
Chronic pulmonary disease[c]	46	37.1
Urinary tract problems/abnormalities	35	28.2
Chronic renal disease	27	21.8
Gastrointestinal disease[d]	17	13.7
Malignancy (hematologic or solid organ)	14	11.3
Transplant (solid organ)	2	1.6
Unknown	5	4.0

[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, 2017[a] (N=124)

Healthcare facility stay in the year before the date of incident specimen collection	No. of Cases	%
Acute care hospitalization	107	86.3
Long-term care facility residence	86	69.4
Long-term acute care hospitalization	10	8.1

Exposure	No. of Cases	%
Surgery in the year before the date of incident specimen collection	51	41.1
Specimen collected ≥3 days after hospital admission	32	25.8
Chronic dialysis	20	16.1

Selected medical device(s) in place in the 2 calendar days before the date of incident specimen collection	No. of Cases	%
Urinary catheter	74	59.7
Central venous catheter	54	43.5
Other[b]	61	49.2

[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, 2017 (N=124)

Outcomes	No. of Cases	%
Hospitalized on the day of or in the 29 days after the date of incident specimen collection	98	79.0
ICU admission in the 6 days after the date of incident specimen collection	26	21.0

Discharge location among hospitalized	No. of Cases	%
Long-term care facility/long-term acute care hospital	42/98	42.9
Private residence or other discharge location	31/98	31.6
Died during hospitalization	25/98	25.5
Died within 30 days of incident specimen collection date	24	19.4
Cases with an incident sterile site specimen	16/47	34.0
Cases with an incident urine specimen	8/77	10.4

Summary:

Surveillance data from 2017 represent the sixth full year of population-based surveillance for CRAB through the Emerging Infections Program. The overall crude incidence rate of CRAB in 2017 was 0.80 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 was highest among persons aged 65–79 years.

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; 21.0% of cases required ICU admission. Overall, crude mortality was 19.4%, 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. 27th ed. CLSI supplement M100 (ISBN 1-56238-804-5 [Print]; ISBN 1-56238-805-3 [Electronic]). Clinical and Laboratory Standards Institute, 950 West Valley Road, Suite 2500, Wayne, Pennsylvania 19087 USA, 2017.

Citation:

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 (HAICViz) (https://www.cdc.gov/hai/eip/haicviz.html)