Emerging Infections Program (EIP) Network Report Healthcare-Associated Infection Community Interface Multi-site Gram-negative Surveillance Initiative Carbapenem-Resistant *Acinetobacter baumannii* Complex (CRAB) Surveillance, 2014

EIP Areas:
Colorado (5 county Denver area); Georgia (8 county Atlanta area); Maryland (4 county Baltimore area); Minnesota (2 metro Twin Cities counties); New Mexico (1 county Albuquerque area); New York (1 county Rochester area); Oregon (3 county Portland area); and Tennessee (8 county Nashville area). Tennessee was a new surveillance area in 2014.

Population
The surveillance areas represent 15,012,292 persons.
Source: National Center for Health Statistics bridged-race vintage 2014 postcensal 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 2014.

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 2014.

Incidence rates for CRAB cases were calculated using the 2014 US Census estimates of the surveillance area population as the denominator. Cases with unknown race (4.5% in 2014) 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=156), 2014[a]

Sex	Incidence Rate/100,000 Population	95% CI
Female	0.68	0.65, 0.70
Male	1.42	1.39, 1.45

Race	Incidence Rate/100,000 Population	95% CI
White	0.62	0.60, 0.64
Black or African American	2.69	2.63, 2.75
Other[b]	0.17	0.07, 0.47
Invasive cases[c]	0.33	0.31, 0.34
All cases	1.04	1.03, 1.05

[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=156), 2014[a]

No. of Immunocompromised[b] Cases	%
10	6.4

Infection types	No. of Cases	%
Urinary tract infection[c]	76	48.7
Bacteremia[d]	50	32.1
Septic Shock	20	12.8
Pneumonia	11	7.1
Chronic or decubitus skin ulcer	3	1.9
Other infection types	19	12.2
None[e]	17	10.9
Unknown	15	9.6

[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 76 cases with a documented urinary tract infection (UTI), 27 (35.5%) 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=156), 2014

Residence before incident specimen collection	**No. of Cases**	**%**
Long-term care facility	64	41.0
Acute care hospital (inpatient)	41	26.3
Private residence	39	25.0
Long-term acute care hospital	11	7.1
Unknown	1	0.6

Collection location	**No. of Cases**	**%**
Outpatient setting or emergency department	64	41.0
Acute care hospital	50	32.1
Long-term care facility	31	19.9
Long-term acute care hospital	11	7.1

Hospitalized on the day of or in the 29 days after the date of incident specimen collection	**No. of Cases**	**%**
Hospitalized	112	71.8
Not hospitalized	36	23.1
Unknown	8	5.1

Discharge location among hospitalized patients (N=112)	**No. of Cases**	**%**
Long-term care or Long-term acute care facility	46	41.1
Private residence	37	33.0
Died during hospitalization	28	25.0
Unknown	1	0.9

Table 4. Outcome of CRAB Cases(N=156), 2014

Outcome	No. of Cases	%
ICU admission in the 6 days after the date of incident specimen collection	39	25.0
Died	30	19.2
Cases with a positive incident sterile site specimen (N=49)	21	42.9
Cases with a positive incident urine specimen (N=107)	9[a]	8.4

[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=156), 2014[a]

Healthcare facility stay in the year before the date of incident specimen collection	No. of Cases	%
Acute care hospital	129	82.7
Long-term care facility	97	62.2
Long-term acute care hospital	27	17.3

Exposure	No. of Cases	%
Surgery in the year before the date of incident specimen collection	54	34.6
In ICU in the 7 days before the date of incident specimen collection	20	12.8
Specimen collected ≥3 days after hospital admission	32	20.5
Chronic dialysis	22	14.1
Selected medical devices in place in the 2 calendar days before the date of incident specimen collection	126	80.8
Urinary catheter	91	58.3
Central venous catheter	62	39.7
Other[b]	65	41.7

[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 2014, 156 incident cases of CRAB were identified, representing 143 unique case-patients. The overall crude incidence rate of CRAB was 1.04 cases per 100,000 persons, with higher incidence in men than women, and higher in 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. Isolate were most commonly collected while a patient was in the outpatient setting or emergency department, and patients were most commonly located in the long-term care facility prior to their incident specimen collection.

Most cases required hospitalization with 25% requiring ICU admission. Overall, mortality was 18%, and higher in patients who had their CRAB isolated from a sterile site source compared with patients with a CRAB isolated from a urine specimen source.

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. Performance standards for antimicrobial susceptiblity testing: twenty-fouth informational supplement. M100-S24. Wayne PA: The Institute; 2014.

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, 2014. Available at: https://www.cdc.gov/hai/eip/pdf/mugsi/2014-CRAB-Report-508.pdf