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## Update on Carbapenem-Resistant Enterobacteriaceae in Alaska, 2018

### Background

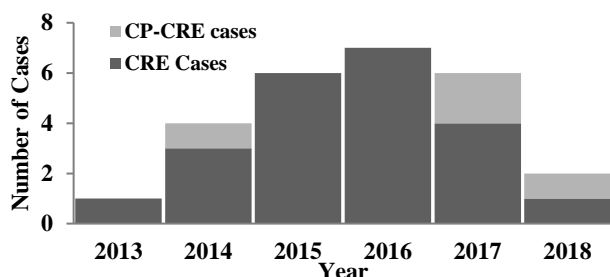
Carbapenem-resistant Enterobacteriaceae (CRE) are a family of bacteria that exhibit high levels of resistance to certain antibiotics. Most CRE infections occur in healthcare settings, where bacteria are spread through contact with infected or colonized people, particularly contact with wounds or stool. CRE can cause a variety of infections, such as urinary tract infections and pneumonia, and contribute to death in up to 50% of infected patients.<sup>1</sup> Some people are colonized with CRE and have no symptoms. Additional CRE background information can be found in a previous *Bulletin*.<sup>2</sup>

In 2013, CRE became a reportable condition in Alaska; in 2018, some types of CRE will become nationally reportable.<sup>3</sup> The CRE case definition has evolved over time; the current Alaska definition is available on the Section of Epidemiology (SOE) Healthcare-Associated Infections (HAI) Program website.<sup>4</sup>

### Epidemiology of CRE in Alaska 2013–2018

Since 2013, SOE has recorded 26 confirmed cases of CRE; four were carbapenemase-producing (CP) CRE (Figure). The mean age of CRE patients was 65 years (range: 22–92 years); 16 (61%) were female. Cases were reported in persons from all Alaska regions. Most isolates (n=18, 69%) were cultured from urine. Many cases were in persons who had received health care outside of Alaska, and likely represent imported cases.

Figure. CRE Case Counts by Year — Alaska, 2013–2018\*



\*2018 cases only represent the first three months of the year.

### Microbiology

*Enterobacter cloacae* was the most commonly reported CRE species, followed by *Klebsiella pneumoniae* and *Escherichia coli*. All CP-CRE cases were *K. pneumoniae* isolates carrying the KPC gene, the most common carbapenemase gene in the U.S.

### Alaska-specific Risk Factors

All four patients with CP-CRE reported having been hospitalized outside of Alaska at some point prior to their CRE diagnosis; two appear to have carried CP-CRE for more than a year. At least nine patients were identified from outpatient visits related to urinary tract infections (UTI); several of these patients had been treated repeatedly for UTIs.

### Joining the Antibiotic Resistance Lab Network in 2016

The Alaska State Public Health Laboratory (ASPHL) in Anchorage is a member of the Antibiotic Resistance Laboratory Network (ARLN), created by the Centers for Disease Control and Prevention (CDC) in 2016. The goal of the ARLN is to support the ability of laboratories to rapidly detect antibiotic resistance in the community.

ASPHL has validated the Xpert® Carba-R Assay on the Cepheid GeneXpert Instrument System to perform mechanism testing on CRE isolates. This assay can determine whether an *Enterobacteriaceae* isolate possesses one of the five common classes of carbapenem resistance genes. This FDA-approved

assay utilizes automated real-time polymerase chain reaction (PCR) for detection and differentiation of the *blaKPC*, *blaNDM*, *blaVIM*, *blaOXA-48*, and *blaIMP* gene sequences associated with carbapenem-non-susceptibility. This infection control aid enables ASPHL to assist partner organizations (ARLN and SOE) to rapidly detect and respond to outbreaks involving antibiotic resistant bacteria.

### Principles of CRE Prevention and Control

Minimizing exposure to antibiotics is an important component of CRE prevention. Health care providers are strongly encouraged to engage in antimicrobial stewardship work to prevent the development and spread of multidrug resistant organisms (MDRO) like CRE.

If CRE is identified in a patient in a hospital or long-term care facility, sound infection control practices are needed to prevent its spread to other patients. Hand hygiene and observation of full contact precautions are crucial. Additional guidelines for MDRO investigations are available from CDC.<sup>5</sup> SOE's HAI Program is available to assist with investigations.

### Recommendations

1. Health care providers and laboratories (7 AAC 27.005 and .007) should notify SOE of suspected or confirmed cases of CRE at 907-269-8000.
2. All requests for CRE testing must be referred to SOE at 907-269-8000 prior to submission and testing at ASPHL.
3. Providers should consider CRE risk in patients with chronic urologic issues and catheter use, and minimize antibiotic and catheter exposure.<sup>6</sup>
4. Healthcare facilities should promptly implement the following infection control measures for every suspected or confirmed CRE case:<sup>7</sup>
  - place patient in a private room or cohort with other CRE-infected patients;
  - initiate contact precautions and reinforce good hand hygiene;
  - initiate enhanced surveillance or screening for additional cases;
  - educate health care personnel about preventing transmission; and
  - inform other healthcare facilities involved in the care or transfer of the patient.
5. Healthcare facilities should support and promote antimicrobial stewardship programs in order to slow the development and spread of antibiotic resistance. More information is available at: <https://www.cdc.gov/antibiotic-use/index.html>

### References

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3. CDC. Carbapenemase Producing Carbapenem-Resistant Enterobacteriaceae (CP-CRE) Case Definition. <https://wwwn.cdc.gov/nndss/conditions/carbapenemase-producing-carbapenem-resistant-enterobacteriaceae/case-definition/2018/>
4. SOE HAI Program. CRE Case Definition. Available at: <http://dhss.alaska.gov/dph/Epi/id/SiteAssets/Pages/HAI/default/CRE%20case%20definition.pdf>
5. CDC. Interim Guidance for a Public Health Response to Contain Novel or Targeted Multidrug-resistant Organisms (MDROs). Available at: <https://www.cdc.gov/hai/outbreaks/docs/Health-Response-Contain-MDRO.pdf>
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7. CDC. 2012 CRE Toolkit: Guidance for Control of CRE. Available at: <http://www.cdc.gov/hai/organisms/cre/cre-toolkit/index.html>