

## Quarterly Update on Carbapenem-Resistant Enterobacteriaceae and Other Carbapenemase-Producing Organisms for Washington State

ISOLATES REPORTED TO THE DEPARTMENT OF HEALTH AND TESTED AT THE PUBLIC HEALTH LABORATORIES, BY DATE OF COLLECTION, **APRIL- JUNE 2017**

Washington State Department of Health has performed surveillance and testing for CRE since October 2012. This update summarizes reports of carbapenem-resistant Enterobacteriaceae (CRE) isolates and other carbapenemase-producing organisms (CPO) collected from April through June, 2017. We include all CRE and CPO isolates diagnosed in-state and isolates from Washington residents diagnosed out-of-state and reported to the department. Isolates were included if they were the first unique genus/species/carbapenemase profile reported from an individual patient since surveillance began in 2012. If an isolate produced more than one carbapenemase, it was counted once for each novel carbapenemase.

The CRE case definition since May 2015, is:

*E. coli*, *Klebsiella* spp., and *Enterobacter* spp. resistant to any carbapenem, according to Clinical Laboratory Standards Institute (CLSI) breakpoints: minimum inhibitory concentrations of  $\geq 4$  mcg/ml for meropenem, imipenem, and doripenem or  $\geq 2$  mcg/ml for ertapenem.

See the 2010-2015 CRE Surveillance Summary (<http://www.doh.wa.gov/portals/1/Documents/Pubs/420-163-CRE-Summary2015.pdf>) for details about the case definitions prior to May 2015.

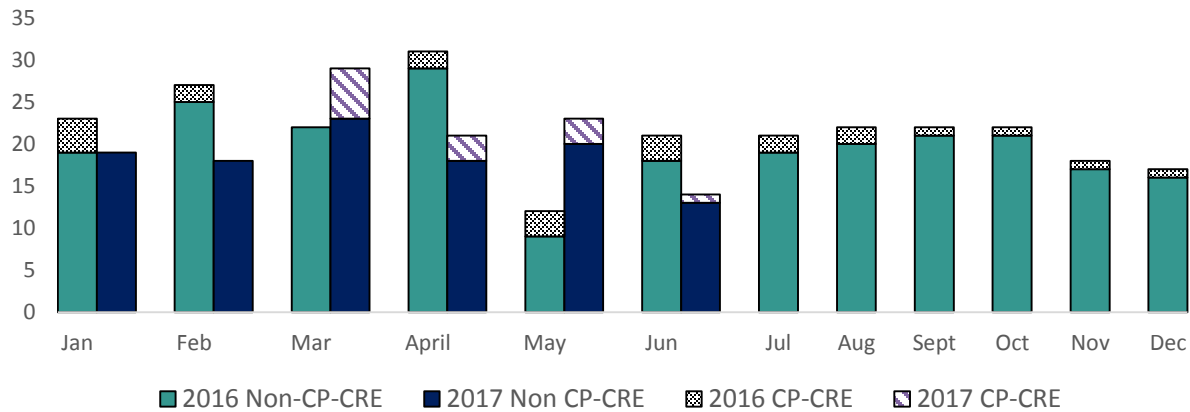
The Washington State Public Health Laboratories (PHL) test CRE isolates for the following carbapenemase genes:

- *Klebsiella pneumoniae* carbapenemase (KPC)
- New Delhi metallo- $\beta$ -lactamase (NDM)
- Oxacillin-hydrolyzing  $\beta$ -lactamase-48 (OXA-48)
- Verona integron-encoded metallo- $\beta$ -lactamase (VIM)
- Imipenem-hydrolyzing  $\beta$ -lactamase (IMP)

In addition, PHL solicits and tests other Gram-negative organisms. CR-*Pseudomonas* isolates are submitted by 22 sentinel laboratories in Washington. The department requests that CR-*Acinetobacter* isolates be submitted by all laboratories in the state. Other CR-genera within the family Enterobacteriaceae may be submitted and tested by special request. Carbapenem-resistance in other genera of bacteria is determined by CLSI breakpoints.

The bar graph shows CRE and carbapenemase-producing Enterobacteriaceae isolates collected in 2017, compared to those submitted and tested in 2016 (Figure 1).

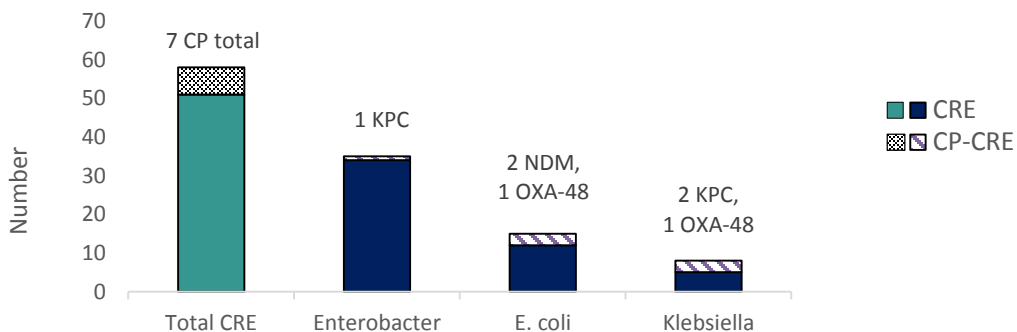
**Figure 1. Carbapenem-Resistant Enterobacteriaceae Isolates, Washington, 2016 and 2017**



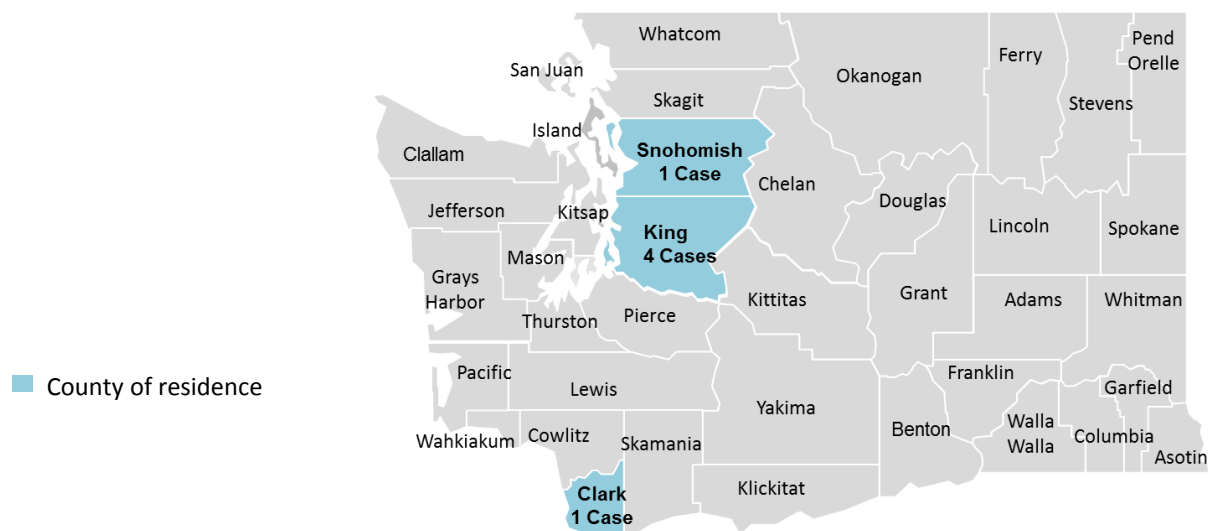
**Quarter 2 2017**

- Fifty-eight (58) CRE isolates were reported statewide in the second quarter of 2017. The contrasting color/pattern at the top of each bar represents the number of CRE isolates that were confirmed by PCR testing to carry a carbapenemase gene (Figure 1).
- Of 58 CRE isolates, 35 (60%) were *Enterobacter* spp., 15 (26%) *E. coli*, and 8 (14%) *Klebsiella* spp. (Figure 2).
- Of 58 CRE isolates, 7 (12%) isolates from 6 individual patients tested positive for carbapenemase: 3 KPC, 2 OXA-48, and 2 NDM. (Figure 2)
- One of 35 (3%) *Enterobacter* isolates was carbapenemase-positive, as were 3 of 15 (20%) *E. coli* isolates and 3 of 8 (38%) *Klebsiella* isolates. (Figure 2)
- The likely source of acquisition for 5 of the 6 patients with CP-CRE was healthcare in Washington. The remaining 6th case likely acquired the carbapenemase during international travel or healthcare. (Table 1)
- During quarter 2 of 2017, 5 carbapenemase cases were diagnosed in King county, two of whom are residents in another county. One case, a resident of Clark county, was diagnosed in Oregon. (Figure 4). We offer this breakdown of cases by county to inform local health, facilities, and providers of recent carbapenemase activity in their region. The quarter two map of cases by county of residence is shown in Figure 3 below.
- CRPA/CRA surveillance testing: Fifty-eight CR-*Pseudomonas* and twelve CR-*Acinetobacter* isolates were submitted for carbapenemase testing in the second quarter of 2017, and none tested positive for carbapenemase production.

**Figure 2. Submitted CRE isolates by genus and carbapenemases, Washington, January through March 2017**



**Figure 3. Number of Patients with Carbapenemase-producing Organism(s) Reported in Washington, by County of Residence, April through June 2017 (Quarter Two)**



**Table 1. Carbapenemases Identified and Likely Source, Washington State, Quarter 2, 2017**

Carbapenemase	Number of cases	Likely Source
KPC	3	Healthcare in Washington
NDM and OXA-48	1	International Healthcare (India)
NDM	1	Healthcare in Washington
OXA-48	1	Foreign born, suspect healthcare in Washington

The Public Health Laboratories accepts and tests other carbapenem-resistant Gram-negative organisms, such as other genera in the family Enterobacteriaceae, upon request, or if specialized screening tests (e.g., RAPIDEC® Carba-NP or Rosco Diagnostica Neo-Sensitabs) indicate suspicion for carbapenemase production.

Please contact Kelly Kauber at 206-418-5500 or [kelly.kauber@doh.wa.gov](mailto:kelly.kauber@doh.wa.gov) for any questions or comments about this report, or for information on becoming a sentinel lab.