



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, **JANUARY-MARCH 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 January through March, 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 breakpoints: minimum inhibitory concentrations of ≥ 4 mcg/ml for meropenem, imipenem, and doripenem or ≥ 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.

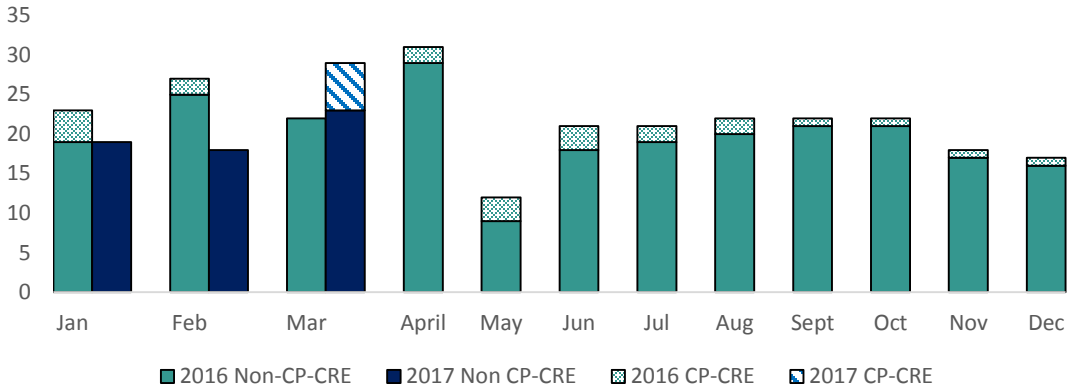
The Washington State Public Health Laboratories (PHL) test CRE isolates for the following carbapenemase genes:

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

In addition, PHL tests other Gram-negative organisms. CR-Pseudomonas isolates are submitted by 22 sentinel laboratories in Washington. The department requests that CR-Acinetobacter are submitted by all laboratories in the state. Other CR-genera within the family Enterobacteriaceae are submitted and tested on special request.

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

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



Quarter 1 2017

- Sixty-six CRE isolates were reported statewide in the first 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 66 CRE isolates, 39 (59%) were *Enterobacter* spp., 18 (27%) *E. coli*, and 9 (14%) *Klebsiella* spp. (Figure 2).
- Of 66 CRE isolates, 6 (9%) isolates from 6 individual patients tested positive for carbapenemase: 4 KPC and 2 NDM. (Figure 2)
- Five of nine (56%) *Klebsiella* isolates were carbapenemase-positive, whereas 1 of 18 (6%) *Enterobacter* isolates, and zero *E. coli* isolates tested positive for carbapenemase. (Figure 2)
- The four KPC cases are likely associated with healthcare received in Washington State.
- Both NDM cases had history of international healthcare identified as the suspected source of transmission.
- Six carbapenemases were diagnosed in two Washington counties in quarter one of 2017 (Figure 4). Two cases were diagnosed outside of the patient’s county of residence. We offer this breakdown of cases by county to inform local health, facilities and providers of recent carbapenemase activity in their region. The quarter one map is shown in Figure 4 below.
- Forty-five CR-*Pseudomonas* and three CR-*Acinetobacter* isolates were submitted for carbapenemase testing in the first quarter of 2017, and none tested positive for carbapenemase production (Figure 3).

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

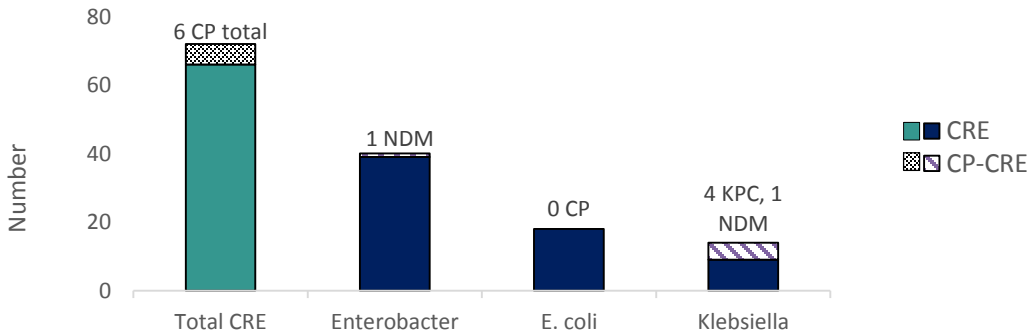


Figure 3. Submitted CRO isolates by genus and carbapenemases, Washington, January through March 2017

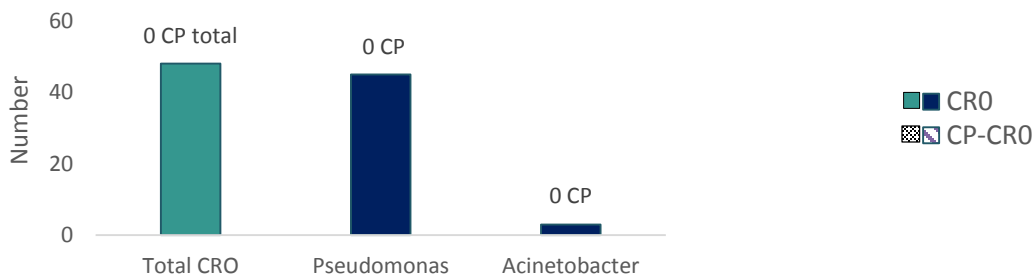


Figure 4. Number of Patients with Carbapenemase-producing Organism(s) Reported in Washington, by Location of Residence, January through March 2017 (Quarter One)

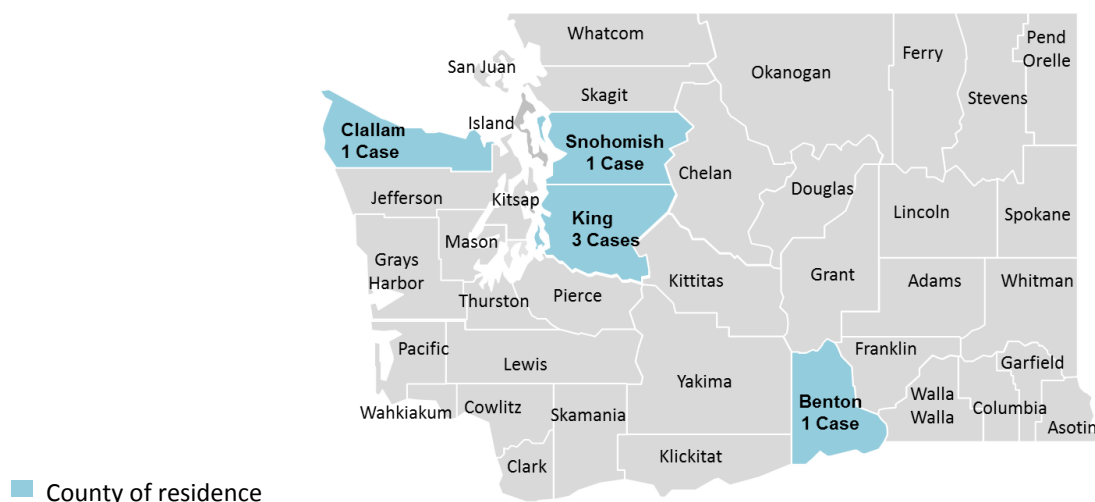


Table 1. Carbapenemases Identified and Likely Source, Washington State, Quarter 1

Carbapenemase	Number of cases	Likely Source
KPC	4	Healthcare in Washington
NDM	2	International Healthcare (Pakistan, India)

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 for any questions or comments about this report, or for information on becoming a sentinel lab.