



## 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 2016

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) with specimen collection dates from January through March, 2016. This summary represents isolates from residents of Washington diagnosed in-state; residents of Washington diagnosed out-of-state and reported to the department; and residents of other states or countries diagnosed in Washington. 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  $\geq 4$  mcg/ml for meropenem, imipenem, and doripenem or  $\geq 2$  mcg/ml for ertapenem).

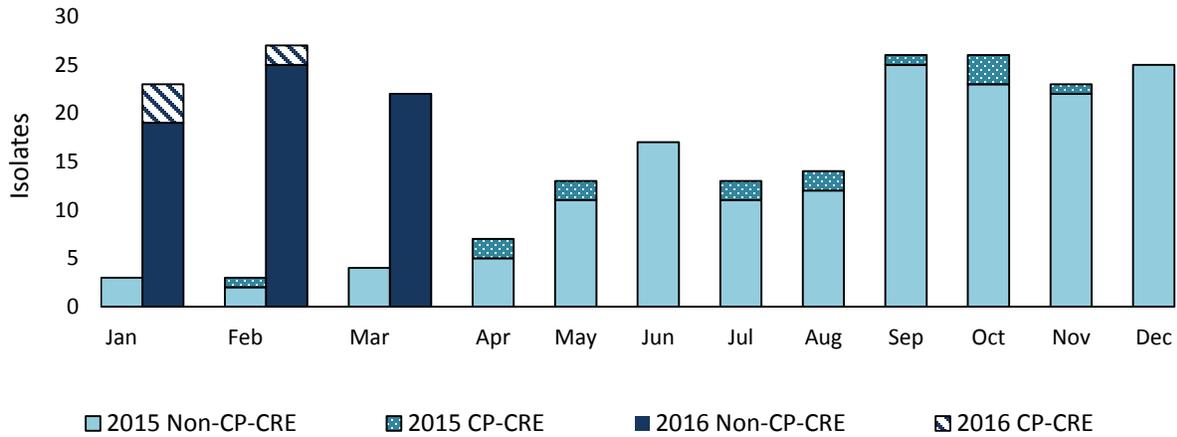
Please see the 2010-2015 CRE Surveillance Summary for details about the case definitions prior to May 2015.

The Washington State Public Health Laboratories (PHL) test submitted CRE isolates for the following carbapenemases, to confirm carbapenemase-producing (CP) genes:

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

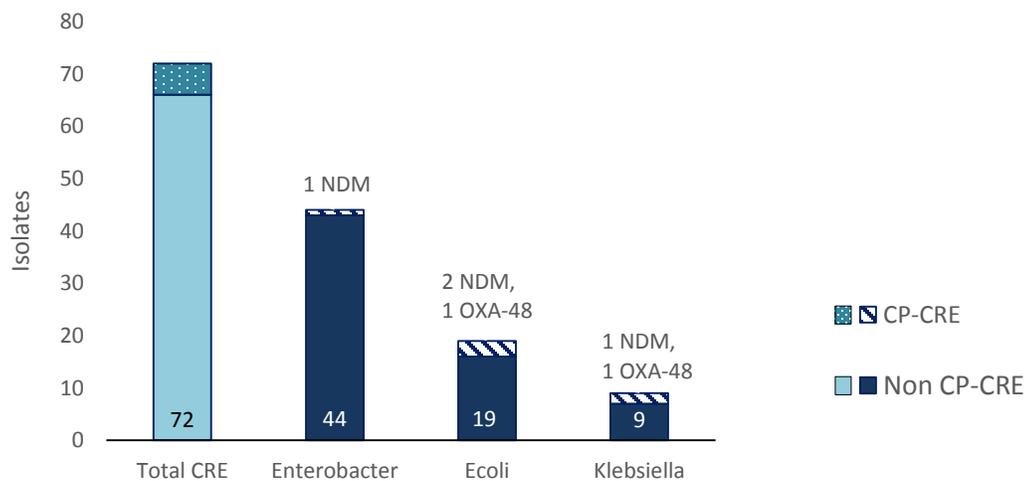
The bar graph shows reported CRE isolates submitted to and tested by PHL through collection date of March 31, 2016, compared to those submitted and tested in 2015 (Figure 1). Note that the new case definition was implemented in May 2015 which may explain some of the difference between total case counts in 2015 and 2016.

**Figure 1. Carbapenem-Resistant Enterobacteriaceae Isolates, Washington, 2015 and January through March 2016**



- A total of 72 CRE isolates have been reported statewide in the first quarter of 2016, compared to 10 reported during the same time period in 2015. The contrasting color at the top of each bar represents the number of total CRE isolates that were confirmed carbapenemase-producing (Figure 1).
- Of 72 CRE isolates, 44 (62%) were *Enterobacter* spp., 19 (26%) *E. coli*, and 9 (12%) *Klebsiella* spp. (Figure 2)
- Of 72 CRE isolates, 6 (8%) isolates from 6 individual patients tested positive for carbapenemase: 4 NDM and 2 OXA-48. (Figure 2)
- One of 44 (2%) *Enterobacter* isolates was carbapenemase-positive, whereas 3 of 19 (16%) *E. coli* and 2 of 9 (22%) *Klebsiella* isolates tested positive for carbapenemase.

**Figure 2. Submitted CRE isolates by genus and carbapenemases, Washington, January through March 2016**



- In addition to carbapenemases in Enterobacteriaceae, we identified two *Pseudomonas aeruginosa* isolates that tested positive for VIM from 2 individual patients (not shown in Figure 1 or 2).
- Of the 8 individual patients with any carbapenemase-producing organism (CP-CRE or other CPO), 5 (62%) had recent international healthcare or travel in Asia or Africa. The other 3 persons with carbapenemase-positive isolates had only in-Washington healthcare.
- Carbapenemases were identified in 4 Washington counties in quarter one of 2016 (Figure 3). We offer this breakdown of cases by county to inform local health, facilities and providers of recent carbapenemase activity in their region.

**Figure 3. Number of Patients with Carbapenemase-producing Organism(s) Reported in Washington, by Location of Residence, January through March 2016**



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

Since our surveillance has recently identified several carbapenemases in *Pseudomonas* isolates, we plan to adopt voluntary surveillance for carbapenem-resistant *Pseudomonas* spp. Please consider submitting any carbapenem-resistant *Pseudomonas* isolates to PHL for carbapenemase testing.

Please contact Marisa D'Angeli at 206-418-5500 or [marisa.dangeli@DOH.wa.gov](mailto:marisa.dangeli@DOH.wa.gov) for any questions or comments about this report.