

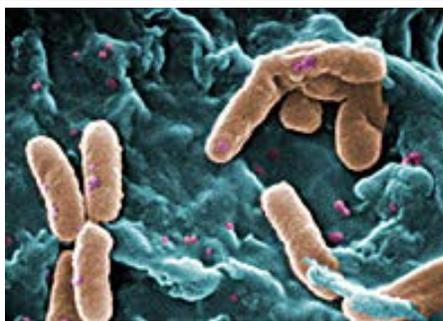
*epi*TRENDS

A Monthly Bulletin on Epidemiology and Public Health Practice in Washington

Antibiotic Resistance

Antibiotic resistance is a growing health care and public health challenge. Infections with resistant organisms can be difficult to treat and may be transmitted person-to-person or from non-human environmental sources. Laboratory support is essential to identify specimens from individual patients as highly antibiotic resistant organisms, to screen exposed persons in support of outbreak investigations in healthcare facilities, and to track trends in Washington for highly resistant organisms. Organisms of particular concern for displaying antibiotic resistance are Enterobacteriaceae, *Pseudomonas*, *Acinetobacter*, and *Candida*.

Antibiotic Resistance Laboratory Network



Pseudomonas aeruginosa
www.cdc.gov/

In the past, the Washington State Department of Health has been involved with surveillance for antibiotic-resistant organisms including methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant Enterococci. The Washington State Public Health Laboratories (PHL) are a proud recipient of newly-announced funding from U.S. Centers for Disease Control and Prevention (CDC) to address

antibiotic resistance. PHL will serve as a regional laboratory within the new Antibiotic Resistance Laboratory Network (ARLN) established by CDC in autumn, 2016. ARLN funding will provide infrastructure and laboratory capacity for seven regional laboratories across the United States to detect and support response to antibiotic-resistant organisms obtained from human samples. As part of the ARLN, PHL will perform testing for antibiotic resistance for the western United States, including for Alaska, California, Hawaii, Nevada, Oregon, and Washington:

Vol. 22 No. 1

2017



*epi*TRENDS
P.O. Box 47812
Olympia, WA 98504-7812

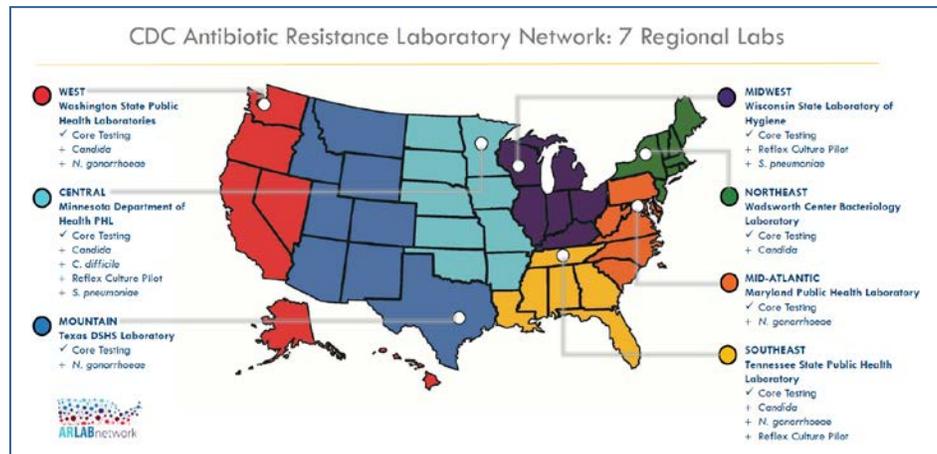
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Washington State Department of Health has conducted ongoing surveillance for carbapenem-resistant Enterobacteriaceae (CRE) since 2012. CRE are highly antibiotic resistant bacteria that have been deemed an “urgent threat” due to the associated high morbidity and mortality and their ability to spread readily in healthcare settings. CRE can develop resistance to carbapenems by a variety of mechanisms; most concerning among these mechanisms is the ability to produce carbapenemase because the genes involved are located on mobile pieces of DNA called plasmids that can easily spread to other bacterial species and genera.

Since surveillance began, CRE cases have generally been increasing in Washington and carbapenemase-producing Enterobacteriaceae (CP-CRE) are no longer considered rare. PHL receives around 15-30 CRE specimens per month, and almost 12% are found by laboratory testing to produce a carbapenemase. Detailed CRE surveillance summary data are available on the Department’s CRE Surveillance webpage (see Resources). DOH will continue to monitor CRE based on Clinical and Laboratory Standards Institute (CLSI) antibiotic resistance criteria.

Antibiotic Resistance Laboratory Network

As part of the ARLN, Washington will be expanding its antibiotic resistance organism surveillance in January 2017 to include

- Carbapenem-resistant *Pseudomonas* species
- Carbapenem-resistant *Acinetobacter* species
- Colistin-resistant *E. coli*, *Klebsiella*, *Enterobacter*, *Pseudomonas* and *Acinetobacter*
- Select *Candida* species

Sentinel Surveillance for Carbapenem-resistant *Pseudomonas* and Carbapenem-resistant *Acinetobacter*

Carbapenem-resistant (CR) *Pseudomonas* and CR-*Acinetobacter* are concerning causes of healthcare-associated infections. Multidrug-resistant *P. aeruginosa* and *Acinetobacter* have been deemed “serious threats” by CDC. Similar to CRE, these bacteria can produce carbapenemases; in fact, since surveillance for CRE began in 2012, PHL has identified 4 patients with carbapenemase-producing *Pseudomonas* and/or *Acinetobacter*. Two of the patients had only in-Washington healthcare, raising concern that these organisms are circulating in our state.

Beginning in 2017, DOH will conduct sentinel surveillance for CR-*Pseudomonas* and CR-*Acinetobacter* from select clinical laboratories throughout the state. Participation by laboratories in this effort is encouraged, but is voluntary. Participating laboratories should submit non-mucoid CR-*Pseudomonas* specimens from non-cystic fibrosis patients and CR-*Acinetobacter* specimens resistant to carbapenems by CLSI criteria.

Surveillance for Plasmid-Mediated Colistin Resistance (*mcr-1*)

Over the past year, plasmid-mediated colistin resistance, *mcr-1*, has been identified in Enterobacteriaceae infecting humans and animals in many countries and continents. The CDC issued a Health Advisory in June 2016 to alert U.S. healthcare facilities that the first *mcr-1* gene in *E. coli* was found in a person in this country (see Resources). Colistin is a last-resort antibiotic for Enterobacteriaceae, *Pseudomonas*, and *Acinetobacter* infections. Plasmid-mediated colistin-resistance is particularly worrisome because in combination with plasmid-mediated carbapenem-resistance, untreatable bacteria may emerge. As of November 2016, *mcr-1* has not been identified in Washington. Currently, there is national surveillance for *mcr-1* in *E. coli* and *Salmonella* via the National Antibiotic Resistance Monitoring System (NARMS).

Laboratories that test for colistin resistance are asked to submit to PHL any *E. coli*, *Klebsiella*, *Enterobacter*, *Pseudomonas*, or *Acinetobacter* specimens resistant to colistin by CLSI criteria. At this time, colistin-resistant specimens will be forwarded to CDC for *mcr-1* testing. PHL will begin testing colistin-resistant Enterobacteriaceae for *mcr-1* in the near future.

Drug-resistant *Neisseria gonorrhoeae*

As part of ARLN, in 2017 PHL will be performing antimicrobial susceptibility determination of confirmed *N. gonorrhoeae* specimens in addition to identification confirmation. This will not change current specimen submission criteria.

Statewide Surveillance for Drug-resistant *Candida*

In recent years, multidrug resistant *Candida auris* has emerged as a cause of invasive fungal infections with high potential to cause outbreaks in healthcare facilities, including in the United States (see Resources for the CDC Clinical Alert). *C. auris* is difficult to identify with standard laboratory methods and is often misidentified as other *Candida* species.



Any laboratory that identifies *C. auris*, *C. haemulonii*, or *C. glabrata* should submit these specimens to PHL. *Candida* species that cannot be identified by the laboratory **after** performing species identification (i.e. species not in the database) should also be submitted. *C. albicans*, *C. dubliniensis*, *C. krusei*, *C. parapsilosis*, *C. lusitaniae* and *C. tropicalis* are excluded from surveillance because they occur commonly and are not currently associated with emerging resistance.

Details on the expanded laboratory surveillance and resistance criteria for specimen submission can be found in the recently-published PHL newsletter Elaborations (see Resources). The change in state surveillance for antibiotic resistant organisms mirrors a shift in national antibiotic resistant organism surveillance. Concerted efforts by multiple levels of healthcare and public health will be most effective in preventing the spread of antibiotic resistant organisms in Washington.

Resources

CDC Antibiotic Resistance Laboratory Network

<https://www.cdc.gov/drugresistance/solutions-initiative/ar-lab-networks.html>

CDC antimicrobial resistance

<https://www.cdc.gov/drugresistance/about.html>

CDC *mcr-1* health advisory

<http://health.mo.gov/emergencies/ert/alertsadvisories/pdf/cdc-advisory61316.pdf>

CDC *Candida auris* clinical alert

<https://www.cdc.gov/fungal/diseases/candidiasis/candida-auris-alert.html>

DOH CRE surveillance

<http://www.doh.wa.gov/DataandStatisticalReports/DiseasesandChronicConditions/CommunicableDiseaseSurveillanceData/CRESurveillance>

DOH Elaborations newsletter

<http://www.doh.wa.gov/Portals/1/Documents/2700/505068-2016NovDec.pdf>