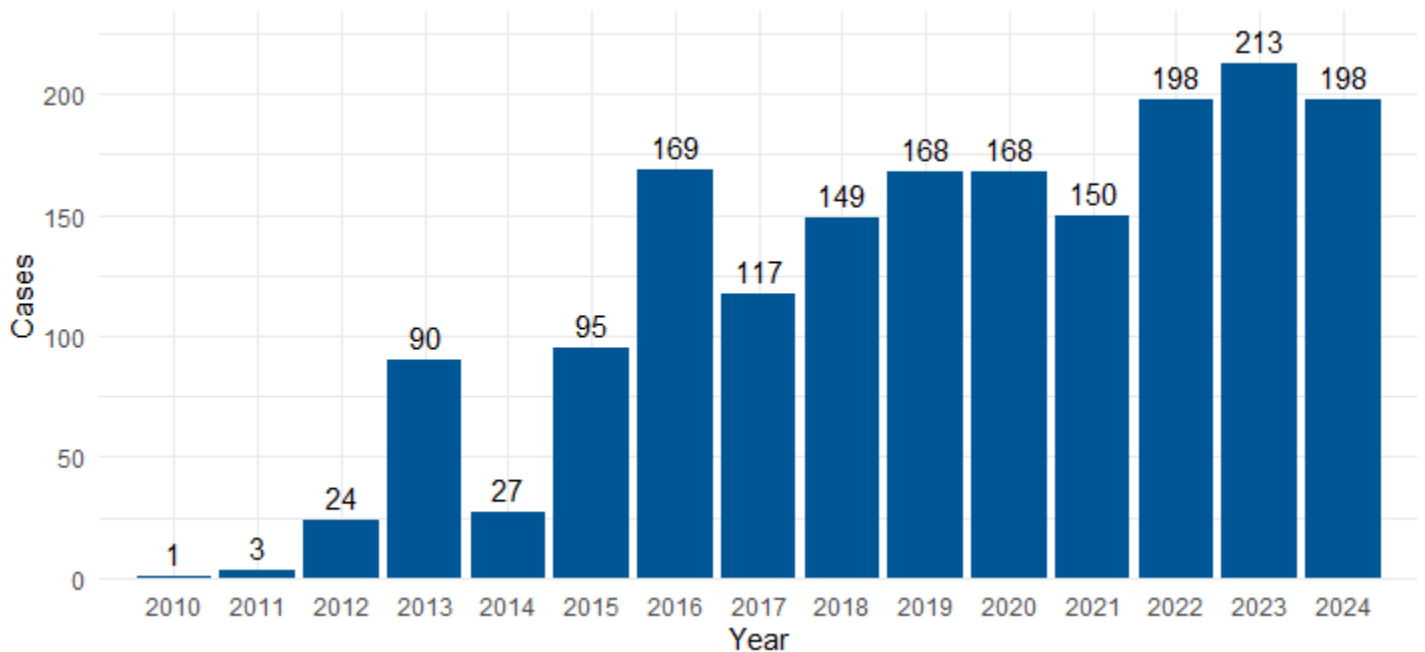


Laboratory-based surveillance for Carbapenem-resistant *Enterobacterales* (CRE)

Figure 1. CRE cases of infection or colonization in Oregon residents by year, Nov 2010 - Dec 2024



About carbapenem-resistant *Enterobacterales* (CRE)

Carbapenems are broad-spectrum antibiotics frequently used to treat severe infections caused by Gram-negative bacteria. Carbapenem resistance in the *Enterobacterales* order emerged as a public health concern over the past 15 years, as few treatment options remain for some severely ill patients.

CRE Resistance

Carbapenem resistance emerges through various mechanisms, including impaired membrane permeability and the production of carbapenemases (enzymes that break down the carbapenems). Carbapenemase-producing CRE (CP-CRE) are associated with rapid spread in health care settings and require the most aggressive infection control response; however, all CRE call for certain infection control measures, including contact precautions or enhanced barrier precautions, and should be considered a public health and infection prevention priority.

CRE Infection

CRE can cause a variety of infections including pneumonia, bloodstream infections, surgical site infections, urinary tract infections. Infections with CRE often require the use of very expensive antibiotics that may have toxic side effects.

While CP-CRE have spread rapidly throughout the United States, they are still not endemic in Oregon. We strive to prevent or delay their spread through surveillance and infection control.

CRE Definition

In July of 2015, Oregon Public Health Division changed its CRE surveillance definition. The current definition is: resistance to any carbapenem including doripenem, ertapenem, imipenem or meropenem using the current M100-ED34 CSLI breakpoints. The new definition has been applied to previously reported cases for this report.

Epidemiology of CRE in Oregon

Laboratories have reported 1,770 cases of infection or colonization with CRE in Oregon residents between November 2010 and December 2024. Of these 1,770 cases, 787 (44.5%) were hospitalized at the time of culture collection; 935 (52.8%) were outpatients and specimens were collected in a variety of locations including clinics, emergency departments, long-term care facilities or home health settings. The setting for specimen collection was unknown for 48 (2.7%).

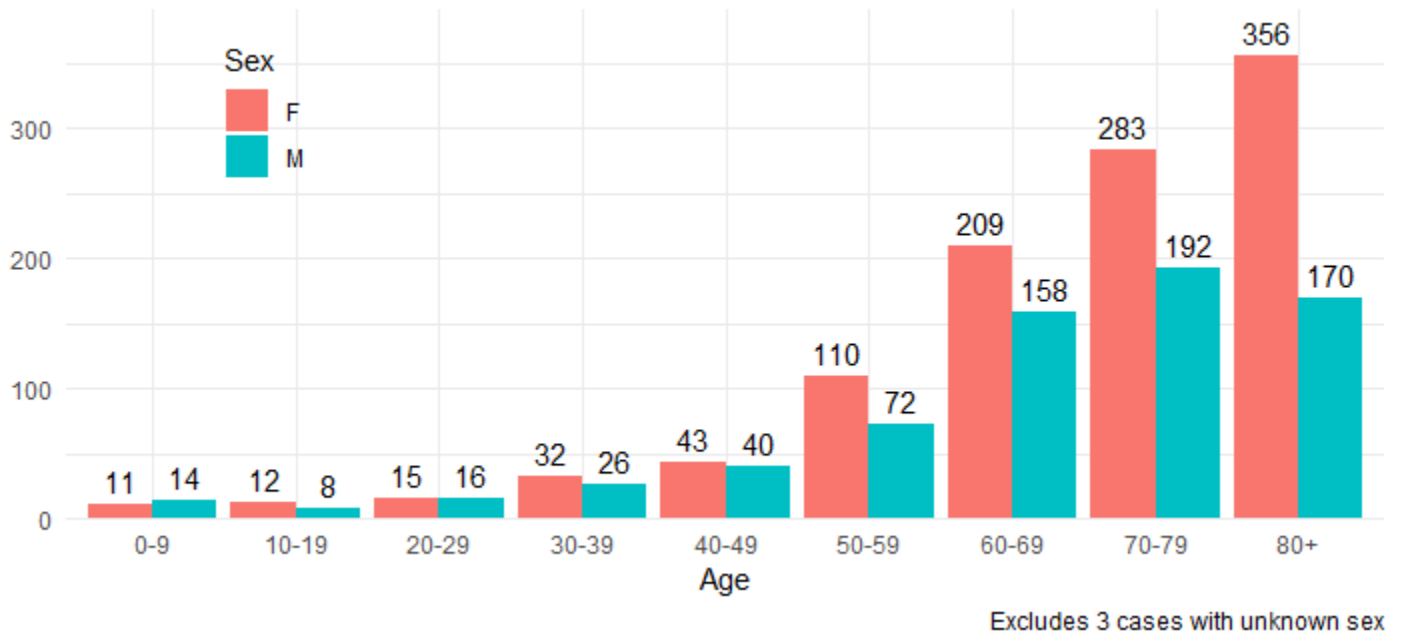
Table 1 displays the frequencies of each organism type (genus and species) and anatomical site of culture among these cases.

CRE have been isolated from clinical cultures collected from residents of 35 Oregon counties. Figure 2 shows case numbers by age and sex.

Table 1. Organism and anatomical site of culture, Oregon CRE cases

Organism	Specimen Source					Total
	Blood	Respiratory	Urine	Wound	Other	
<i>Enterobacter cloacae</i>	23	59	689	109	34	914
<i>Escherichia coli</i>	16	7	189	19	10	241
<i>Klebsiella aerogenes</i>	6	16	144	12	10	188
<i>Klebsiella pneumoniae</i>	8	9	143	12	7	179
Other	4	7	113	29	8	161
<i>Serratia marcescens</i>	4	16	58	7	2	87
Total	61	114	1,336	188	71	1,770

Figure 2. Oregon CRE cases by age group and sex, Nov 2010 - Dec 2024



Carbapenemase-producing CRE

101 carbapenemase-producing CRE (CP-CRE) have been identified by Oregon labs (Figure 3). 94 (93.1%) were from Oregon residents: 23 (24.5%) *Klebsiella pneumoniae* carbapenemase (KPC), 44 (46.8%) New Delhi metallo- β -lactamase (NDM), 21 (22.3%) Oxacillinase-48 (OXA-48), 2 (2.1%) Imipenemase metallo- β -lactamase (IMP), and 4 (4.3%) with more than one type of carbapenemase.

Figure 3. CP-CRE identified by Oregon laboratories by year, Nov 2010 - Dec 2024

