

Community-wide Surveillance for Carbapenemase Producing Organisms (CPO) Statistical Report for 2025 Quarter 2

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Cumulative Summary & Changes from Previous Quarter *

- CRO counts: 42 (increased by 23)
- CPO counts: 2 (increased by 2)
- CRO antibiotic resistance:
 - 3+ classes of antibiotics: 59.5% (increased by 6.9 percentage points)
 - 4+ classes of antibiotics: 52.4% (increased by 5 percentage points)
 - Pan resistance: 1 (increased by 1)

Please note caution should be taken when comparing 2023 and onward data to previous years as case definition changes have affected case counts.

*For definition and specifics on metrics summarized, please refer to corresponding sections and the surveillance definitions at the end.

CRO Overview

Table 1: CRO cases reported by quarter, Washoe County, 2025

CRO Type	Q1	Q2	Q3	Q4	Total
CRE	8	10	-	-	18
CRPA	11	13	-	-	24
CRAB	0	0	-	-	0
Unk*	0	-	-	-	0
Other CROs	0	-	-	-	0
Total	19	23	0	0	42

* Unknown organism was detected via PCR screening swab that indicated the presence of a CRO, but failed to culture.

- For the current reporting quarter, 23 CROs were reported.
 - 10 CRE and 13 CRPA.

Data presented in this report is preliminary and may be updated in future reports as additional information is received throughout the year.

Table 1-1: Descriptive statistics for reported CRO cases, Washoe County, 2025

Characteristics		2025	
		No.	Percent (%)
Age	Median	65 years	NA
	Minimum	9 years	NA
	Maximum	89 years	NA
Gender	Male	15	35.71%
	Female	27	64.29%
Race/Ethnicity	White, non-Hispanic	32	76.19%
	White, Hispanic	2	4.76%
	Asian	1	2.38%
	Black	1	2.38%
	American Indian/Alaskan Native	3	7.14%
	Other	3	7.14%
	Unknown	0	0.00%
Washoe County Resident	Yes	32	76.19%
	No	10	23.81%
	Unknown	0	0.00%
Specimen Type	Urine	27	64.29%
	Respiratory	5	11.90%
	Wound	5	11.90%
	Rectal	0	0.00%
	Invasive (e.g., blood, cerebrospinal fluid)	4	9.52%
	Other	0	0.00%
	Surgical	1	2.38%
	Unknown	0	0.00%
Facility Type	Inpatient	12	28.57%
	Outpatient	21	50.00%
	Long Term Acute Care	3	7.14%
	Intensive Care Unit	6	14.29%
	Skilled Nursing Facility	0	0.00%
Total		42	100.00

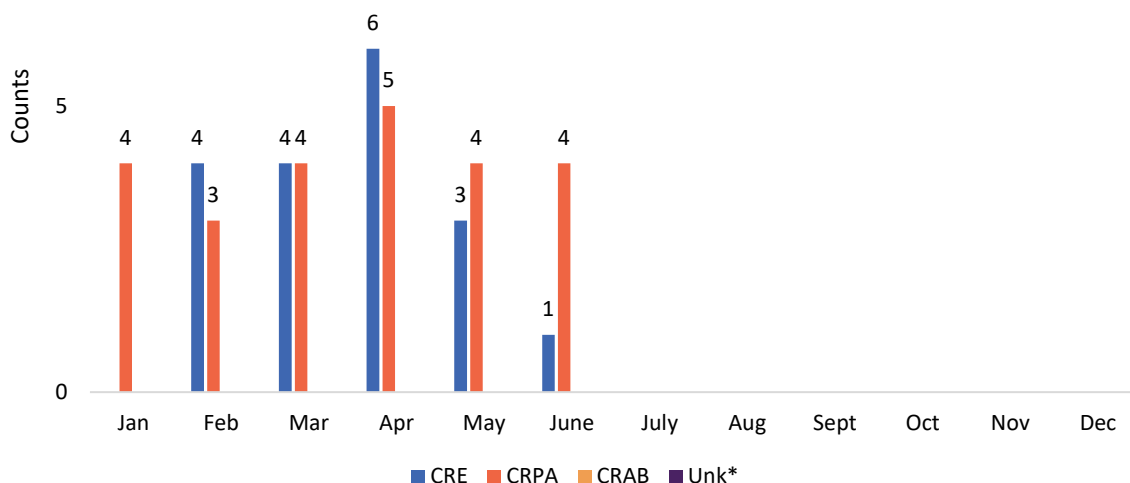
In summary, 2025 CRO cases were:

- 65 years (median age).
- Female (64.29%).
- White, non-Hispanic (76.19%).
- Washoe County residents (76.19%).
- Detected from urine specimens (76.19%), and at outpatient facilities (50.00%).

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Figure 1: CRO cases reported by month, Washoe County, 2025

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* Unknown organism was detected via PCR screening swab that indicated the presence of a CRO, but failed to culture

- CRE cases (blue) increased in April (6 cases) and there were no cases reported in January.
- CRPA (orange) cases slightly increased in April (5 cases) and remained relatively steady.

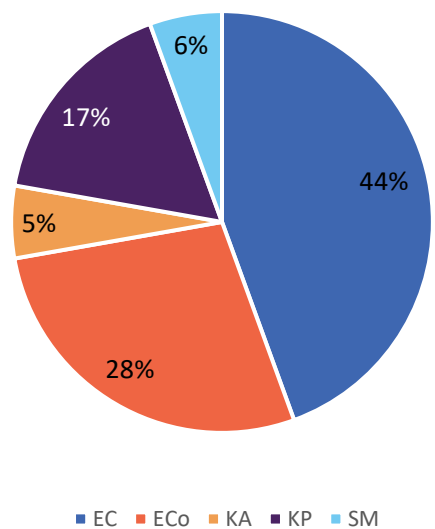
Table 2: Proportion of CROs that were CREs, Washoe County, 2021-2025

Year	CRO Total	CRE Total	Proportion (%)
2021	77	36	46.75
2022	145	62	42.76
2023	81	42	51.85
2024	75	28	37.33
2025	42	18	42.86

- Of the 42 CRO's reported, 42.86% (18/42) were CREs.

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Figure 2: CRE cases reported by organism (N=18), Washoe County, 2025



EC-*Enterobacter cloacae*, ECo-*Escherichia coli*, KA-*Klebsiella aerogenes*, KP-*Klebsiella pneumoniae*, SM-*Serratia marcescens*
Note values in pie chart are rounded.

- Of the 18 CREs reported,
- *Escherichia coli* was the most reported (44%).
 - *Serratia marcescens* and *Klebsiella aerogenes* were the least reported.

Carbapenemase Producing Organisms (CPO)

Table 3: CPO cases reported, Washoe County, 2025

Month/Year Reported	Resistance Mechanism	Organism	Clinical, Screening	Case notes
4/2025	NDM, OXA-48	<i>Klebsiella pneumoniae</i>	Clinical	Recent hospitalization in South Africa and chronic catheter use. No spread identified in Washoe acute care hospital.
4/2025	OXA-48	<i>E. coli</i>	Clinical	Case presented to urgent care with UTI symptoms. No high-risk factors within the previous 12 months identified (international travel or hospitalization). No contacts identified

KPC-*Klebsiella pneumonia* carbapenemase, NDM-New Delhi Metallo-β-lactamase, VIM-Verona Integron-encoded Metallo-β-lactamase

- Two CPOs have been reported so far.

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Tables 4 and 5 and Figures 3 and 4 present laboratory test data used to identify CPOs. The modified carbapenem inactivation method (mCIM) is a phenotypic (observable trait) test, while polymerase chain reaction (PCR) is a molecular test for carbapenemase genes. Please note the following when interpreting the data:

- Not all specimens are forwarded to the Nevada State Public Health Laboratory for mCIM testing.
- Some area hospitals perform PCR testing in-house.
- Though mCIM and PCR positive counts often match, in some instances, a specimen may only test positive for one of either tests.

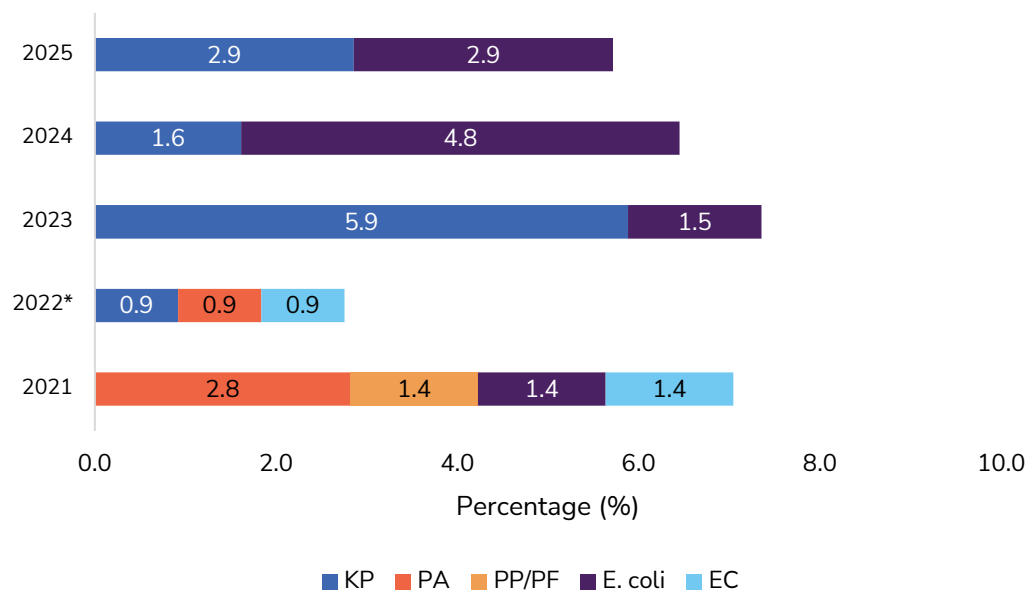
Table 4: Modified carbapenem inactivation method (mCIM) testing, Washoe County, 2021-2025

Year	N Tested	N Positive	Positivity (%)
2021	71	5	7.04
2022*	109	3	2.75
2023	68	2	2.94
2024*	62	4	6.45
2025	35	2	5.71
Total	345	16	4.64

* One CPO is not included in Table 4 as they were identified by PCR testing and were not mCIM tested.

- Out of the 35 specimens submitted for mCIM testing, 2 tested positive.

Figure 3: Percent mCIM positive by organism, Washoe County, 2021-2025



KP-Klebsiella pneumoniae, PA-Pseudomonas aeruginosa, PP/PF-Pseudomonas putida/fluorescens, EC-Enterobacter cloacae

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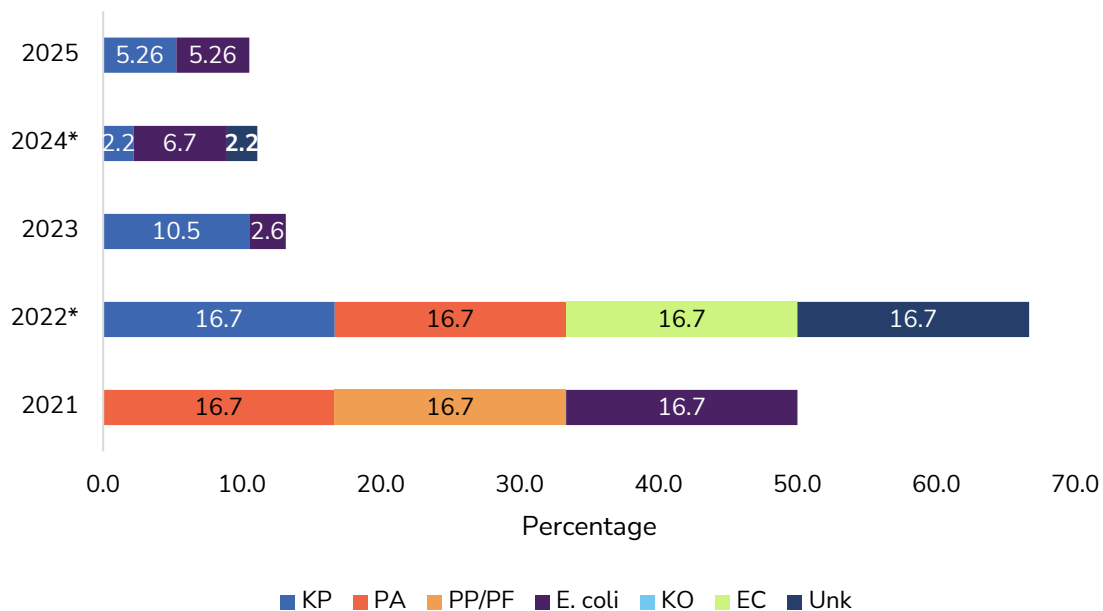
- *Klebsiella pneumonia* and *E. coli* tested mCIM positive in 2025.
- *Klebsiella pneumonia* and *E. coli* have frequently tested mCIM positive in previous years.

Table 5: Polymerase chain reaction (PCR) testing, Washoe County, 2021-2025

Year	N Tested	N Positive	Positivity (%)
2021	6	3	50.0
2022	6	4	66.7
2023	38	5	13.2
2024	45	5	11.1
2025	23	2	8.7
Total	118	19	16.1

- Out of the 23 specimens submitted for PCR testing in 2025, 2 tested positive.

Figure 4: Percent PCR positive by organism, Washoe County, 2021-2025



KP-*Klebsiella pneumoniae*, PA-*Pseudomonas aeruginosa*, PP/PR-*Pseudomonas fluorescens/putida*, EC-*Enterobacter cloacae*, KO-*Klebsiella oxytoca*

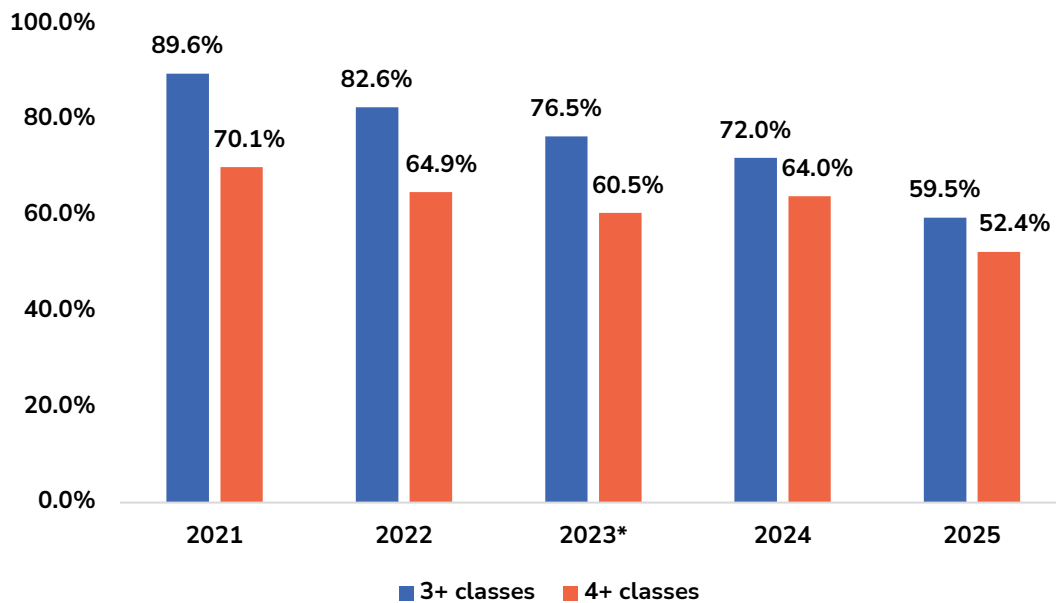
*1 screening specimen was PCR positive, but failed to culture an organism.

- *Klebsiella pneumonia* and *E. coli* tested PCR positive in 2025.
- From 2021-2024, the organisms that were PCR positive varied, however, *Klebsiella pneumonia* and *E. coli* have frequently tested positive in previous years.

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Severity of Antibiotic Resistance

Figure 5: Percent of CRO cases resistant to classes of antibiotics, Washoe County, 2021-2025



* Caution should be taken when comparing 2023 data to previous years as case definition change affected case counts.

In 2025, the proportion of reported CROs resistant to at least

- three or more classes of antibiotics was 59.5% (25/42).
- four or more classes of antibiotics was 52.4% (22/42).
- Between 2021-2024, antibiotic resistance had a downward trend.

Table 6: Pan-resistance rate, Washoe County, 2021-2025

Year	Total N Cases	No. Pan-resistance	Proportion (%)	Organisms (No. pan-resistant)
2021	76	0	0.00	-
2022	145	1	0.69	<i>Pseudomonas aeruginosa</i>
2023	81	1	1.23	<i>Acinetobacter baumannii</i>
2024	75	0	0.00	-
2025	42	1	2.38	<i>Klebsiella pneumoniae</i>

- Proportion pan-resistant*: 2.38% (1/42).

*Pan-resistance is defined as non-susceptible to all tested drugs at the clinical lab.

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Table 7. Antibiotic Susceptibility for CRE, CRPA and CRAB 2025

Antimicrobial Class or Subclass	CRE (n=18)			CRPA ¹ (n=24)			CRAB ¹ (n=0)		
	# Tested	# Susceptible	% Susceptible	# Tested	# Susceptible	% Susceptible	# Tested	# Susceptible	% Susceptible
Penicillins									
Ampicillin	28	0	0.00	2	0	0.00			
Piperacillin									
Cephems									
Cefazolin	19	0	0.00	2	0	0.00			
Cefepime	29	10	34.48	43	29	67.44			
Ceftazidime	17	0	0.00	33	24	72.73			
Ceftriaxone	31	0	0.00	2	1	50.00			
Cefuroxime	11	0	0.00			0.00			
Cephalothin				1	0	0.00			
β-Lactam/β-lactamase inhibitor combinations									
Amoxicillin-clavulanic acid	10	0	0.00						
Ampicillin-sulbactam	30	0	0.00	2	0	0.00			
Piperacillin-tazobactam	32	1	3.13	43	29	67.44			
Fluoroquinolones									
Ciprofloxacin	32	26	81.25	43	24	55.81			
Levofloxacin	32	26	81.25	33	18	54.55			

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Antimicrobial Class or Subclass	CRE (n=18)			CRPA ¹ (n=24)			CRAB ¹ (n=0)		
	# Tested	# Susceptible	% Susceptible	# Tested	# Susceptible	% Susceptible	# Tested	# Susceptible	% Susceptible
Moxifloxacin	3	2	66.67						
Aminoglycosides									
Amikacin	19	18	94.74	38	38	100.00			
Gentamicin	32	28	87.50	8	7	87.50			
Tobramycin	29	24	82.76	33	31	93.94			
Sulfonamides									
Trimethoprim-sulfamethoxazole	31	21	67.74	2	1	50.00			
Monobactams									
Aztreonam	14	0	0.00	26	14	53.85			
Tetracyclines									
Tetracycline	14	8	57.14	2	0	0.00			
Tigecycline	9	9	100.00						
Nitrofurans									
Nitrofurantoin	24	9	37.50	2	0	0.00			
Carbapenems									
Imipenem	2	1	50.00	14	0	0.00			
Meropenem	39	33	84.62	43	11	25.58			
Ertapenem	28	0	0.00	2	0	0.00			

* 1 Pseudomonas aeruginosa and Acinetobacter have intrinsic resistance to Ertapenem.

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Surveillance Definitions (Years Updated)

Report Date (2025)

For this report, the date of specimen collection is used for case counts by months.

Carbapenemase-Producing Organisms (CPO) (2023)

Any specimen that meets confirmatory laboratory evidence:

- Positive phenotypic test for carbapenemase production **OR**
- Molecular test detecting a carbapenemase gene **OR**
- Next generation sequencing detecting a carbapenemase gene.

CPO cases will be classified as either clinical case (collected for diagnosing/treating disease), or as screening case (collected for detecting colonization), however since reason for collecting specimens is not reported, the specimen site denotes CPO case classification. Typically, a CPO identified through a rectal, peri-rectal, axilla, groin, or stool specimen would be considered screening.

Duplicates (2023)

Duplicates are defined as the same organism/carbapenemase combination regardless of collection source and date. A screening case can be counted as a new clinical case if, for example, they developed a blood stream infection, found to be due to the same organism/carbapenemase combination, but a clinical case cannot be counted as a new screening case with same organism/carbapenemase combination.

Carbapenem Resistant *Enterobacteriaceae* (CRE) (2022)

Enterobacteriaceae that meets the following criteria:

- Resistant to ANY carbapenem antimicrobial (i.e., MIC of ≥ 4 mcg/ml for doripenem, meropenem, or imipenem OR ≥ 2 mcg/ml for ertapenem) **OR**
- Documented to produce carbapenemase

In addition:

- For bacteria that have intrinsic imipenem nonsusceptibility (i.e., *Morganella morganii*, *Proteus spp.*, *Providencia spp.*), resistant to carbapenems other than imipenem is required.

Carbapenem Resistant *Pseudomonas aeruginosa* (CRPA) (2022)

Pseudomonas aeruginosa isolated from any body site* that meets the following criteria:

- Resistant to imipenem, meropenem, or doripenem based on current Clinical and Laboratory Standards Institutes Standards (CLSI) M100 standards (≥ 8 mcg/mL);
AND/OR

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- Demonstrates production of a carbapenemase by a recognized method (e.g., CarbaNP or Polymerase chain reaction (PCR) or other methods).

**Excluding isolates from patients with cystic fibrosis (CF).*

Carbapenem Resistant *Acinetobacter* (CRA) (2022)

Acinetobacter isolated from any body site that meets the following criteria:

- Resistant to imipenem, meropenem, or doripenem based on current Clinical and Laboratory Standards Institutes Standards (CLSI) M100 standards (≥ 8 mcg/mL);
AND/OR
- Demonstrates production of a carbapenemase by a recognized method (e.g., CarbaNP or PCR or other methods).

Carbapenem Resistant Organisms (CRO) (2017)

Any organisms meeting the above definitions for CRE, CRPA, and CRA are considered CRO.

Carbapenemase Producing Organisms (CPO) (2017)

Any organisms producing carbapenemase which is laboratory-confirmed are defined as CPO.

Multi-Drug Resistant Bacilli – Carbapenem Resistant (MDRB-CR) (2010-2016)

A case is defined as an infection with an MDRB-CR organism of one patient per hospitalization per year regardless of resident status. Infection with a second species of MDRB-CR organism in the same patient is counted as a separate case. Infections with those Gram-negative bacilli that are constitutively resistant to carbapenems, specifically *Stenotrophomonas*, *Aeromonas* & *Chryseobacterium*, are not counted as cases.

MDRB-CR organisms refer to Gram negative bacilli that are resistant to three or more classes of antibiotics, one of which must be Carbapenem.

Patient's Residency (since 2010)

Patients from out of jurisdiction (OOJ) are included in the surveillance report as long as isolates meet the above surveillance definitions and were identified at a Washoe County health facility.