

Community-wide Surveillance for Carbapenemase Producing Organisms (CPO) Statistical Report for 2025 Quarter 1

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Cumulative Summary & Changes from Previous Quarter *

- CRO counts: 19
- CPO counts: 0
- CRO antibiotic resistance:
 - 3+ classes of antibiotics: 52.6%
 - 4+ classes of antibiotics: 47.4%
 - Pan resistance: 0

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	-	-	-	8
CRPA	11	-	-	-	11
CRAB	0	-	-	-	0
Unk*	0	-	-	-	0
Other CROs	0	-	-	-	0
Total	19	0	0	0	19

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

- For the current reporting quarter, 11 CROs were reported.
 - 8 CRE and 11 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	71 years	NA
	Minimum	48 years	NA
	Maximum	89 years	NA
Gender	Male	6	31.58%
	Female	13	68.42%
Race/Ethnicity	White, non-Hispanic	16	84.21%
	White, Hispanic	0	0.00%
	Asian	1	5.26%
	Black	0	0.00%
	American Indian/Alaskan Native	2	10.53%
	Other	0	0.00%
	Unknown	0	0.00%
Washoe County Resident	Yes	14	73.68%
	No	5	26.32%
	Unknown	0	0.00%
Specimen Type	Urine	13	68.42%
	Respiratory	2	10.53%
	Wound	2	10.53%
	Rectal	0	0.00%
	Invasive (e.g., blood, cerebrospinal fluid)	2	10.53%
	Other	0	0.00%
	Surgical	0	0.00%
	Unknown	0	0.00%
Facility Type	Inpatient	3	15.79%
	Outpatient	10	52.63%
	Long Term Acute Care	1	5.26%
	Intensive Care Unit	5	26.32%
	Skilled Nursing Facility	0	0.00%
Total		19	100.00

In summary, 2025 CRO cases were:

- 71 years (median age).
- Female (68.42%).
- White, non-Hispanic (84.21%).
- Washoe County residents (73.68%).
- Detected from urine specimens (68.42%), and at outpatient facilities (52.63%).

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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) peaked in February and March (4 cases each) and there were no cases in January.
- CRPA cases (orange) peaked in January and March (4 cases each) and there were 3 cases in February.

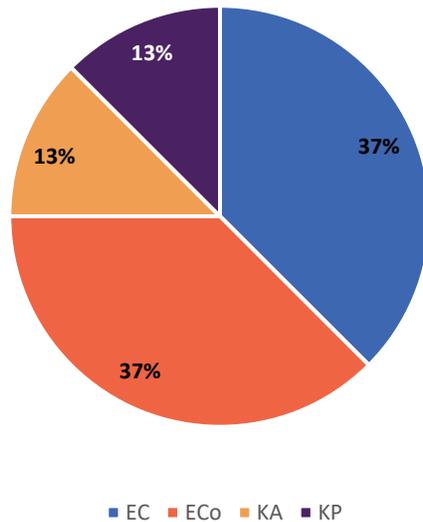
Table 2: Proportion of CROs that were CREs, Washoe County, 2021-2025

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	19	8	42.11

- Of the 19 CRO's reported, 42.11% (8/19) were CREs.

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Figure 2: CRE cases reported by organism (N=8), Washoe County, 2025



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

Of the 8 CREs reported,

- *Enterobacter cloacae* and *Escherichia coli* were the most reported (37% each).
- *Klebsiella aerogenes*, and *Klebsiella pneumoniae*, were the least reported (13% each).

Carbapenemase Producing Organisms (CPO)

Table 3: CPO cases reported, Washoe County, 2025

Table 2: Characteristics of reported CPO cases, Washoe County, 2025

Month/Year Reported	Resistance Mechanism	Organism	Clinical, Screening	Case notes
-	-	-	-	-

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

- No CPOs were reported in Q1.

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.

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- 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.

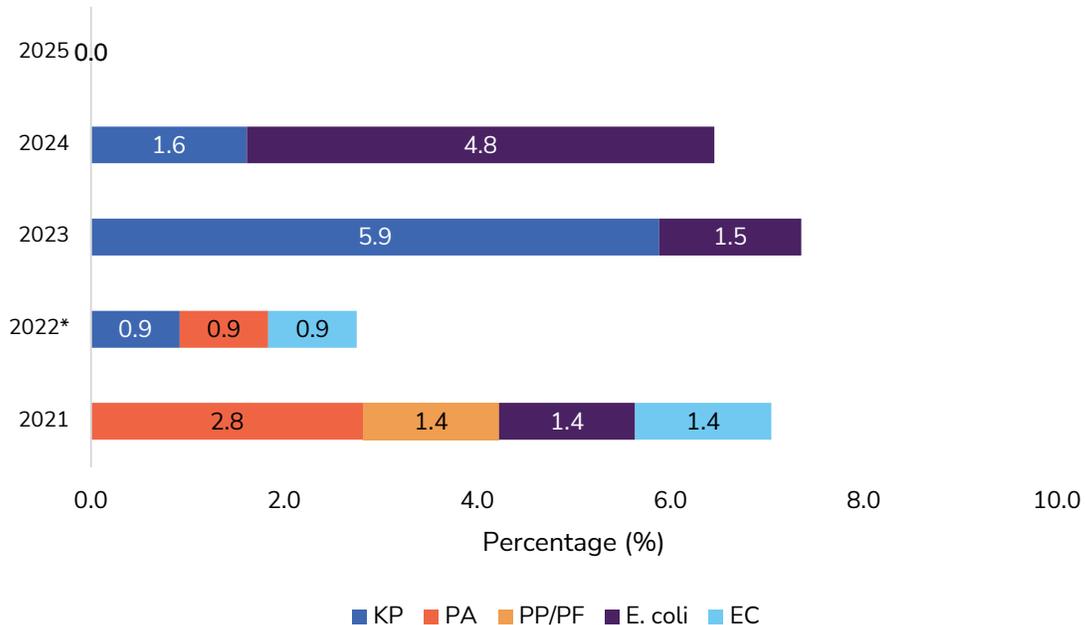
Table 4: Modified carbapenem inactivation method (mCIM) testing, Washoe County, 2021-2025

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	18	0	0.00
Total	328	14	4.27

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

- Out of the 18 specimens submitted for mCIM testing, 0 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*

- No organism tested mCIM positive for 2025's Q1.
- *Klebsiella pneumoniae* and *E. coli* have frequently tested mCIM positive in previous years.

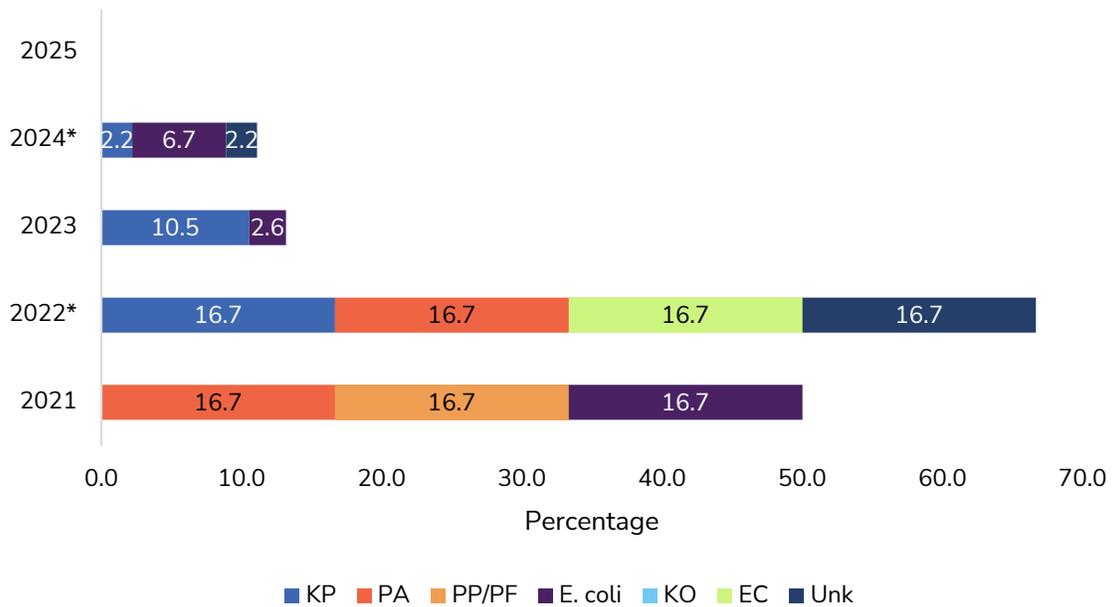
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Table 5: Polymerase chain reaction (PCR) testing, Washoe County, 2021-2025

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	11	0	0.0
Total	106	17	16.0

- Out of the 11 specimens submitted for PCR testing in 2025, 0 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*

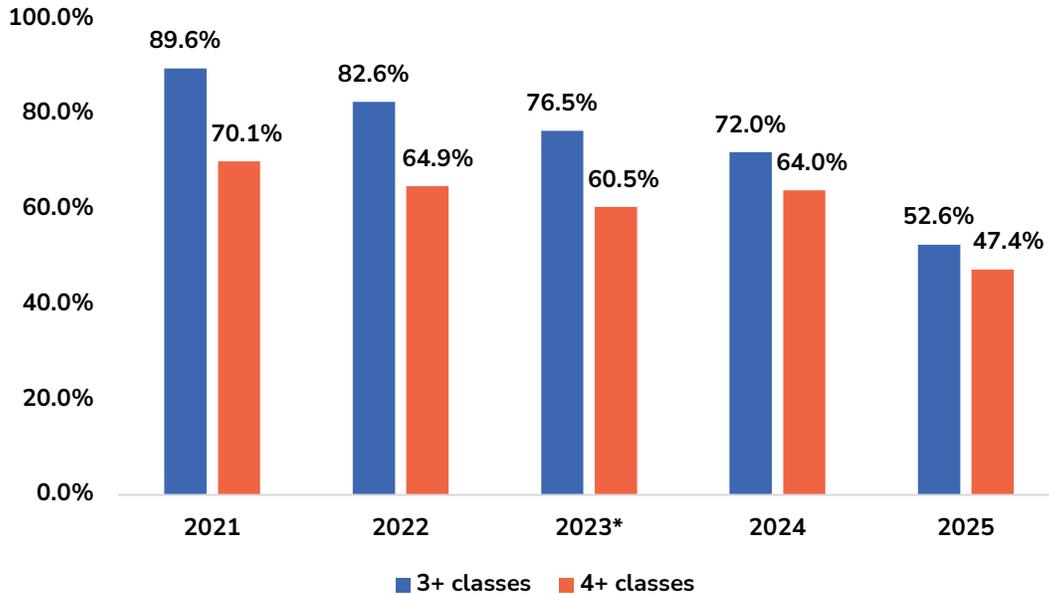
*1 screening specimen was PCR positive, but failed to culture an organism.

- No organisms tested PCR positive for 2025's Q1.
- From 2021-2024, the organisms that were PCR testing varied, however, *Klebsiella pneumoniae* and *E. coli* have frequently tested PCR 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 52.6% (10/19).
- four or more classes of antibiotics was 47.4% (9/19).
- 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	19	0	0.00	-

- Proportion pan-resistant*: 0% (0/19).

*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=8)			CRPA ¹ (n=11)			CRAB ¹ (n=0)		
	# Tested	# Susceptible	% Susceptible	# Tested	# Susceptible	% Susceptible	# Tested	# Susceptible	% Susceptible
Penicillins									
Ampicillin	11	0	0.00	1	0	0.00			0.00
Piperacillin				5	3	60.00			
Cephems									
Cefazolin	7	0	0.00	1	0	0.00			0.00
Cefepime	12	5	41.67	22	17	77.27			0.00
Cefotaxime	1	0	0.00			0.00			0.00
Ceftazidime	9	0	0.00	16	11	68.75			0.00
Ceftriaxone	14	0	0.00	1	1	100.00			0.00
Cefuroxime	4	0	0.00			0.00			0.00
β-Lactam/β-lactamase inhibitor combinations									
Amoxicillin-clavulanic acid	4	0	0.00			0.00			0.00
Ampicillin-sulbactam	12	0	0.00	1	0	0.00			0.00
Piperacillin-tazobactam	14	0	0.00	22	16	72.73			0.00
Fluoroquinolones									
Ciprofloxacin	14	14	100.00	22	9	22.00			0.00
Levofloxacin	14	14	100.00	16	8	50.00			0.00
Moxifloxacin	1	1	100.00			0.00			0.00

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Aminoglycosides									
Amikacin	9	9	100.00	20	20	100.00			0.00
Gentamicin	14	14	100.00	4	3	75.00			0.00
Tobramycin	13	13	100.00	16	16	100.00			0.00
Sulfonamides									
Trimethoprim-sulfamethoxazole	14	12	85.71	1	1	100.00			0.00
Monobactams									
Aztreonam	7	0	0.00	14	9	64.29			0.00
Tetracyclines									
Tetracycline	7	5	71.43	1	0	0.00			0.00
Tigecycline	4	4	100.00			0.00			0.00
Nitrofurans									
Nitrofurantoin	10	6	60.00	1	0	0.00			0.00
Carbapenems									
Imipenem			0.00	8	0	0.00			0.00
Meropenem	17	17	100.00	22	6	27.27			0.00
Ertapenem	14	0	0.00	1	0	0.00			0.00

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

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.