

Community Wide Surveillance for Carbapenem Resistant Organism (CRO) Statistical Report 2021

Surveillance Definitions: REPORT DATE (2021) For this report, the date of specimen collection is used for case counts by months.

Carbapenem Resistant Enterobacteriaceae (CRE)

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) *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
- 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) *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; AND/OR
- Demonstrates production of a carbapenemase by a recognized method (e.g. CarbaNP or PCR or other methods).

Carbapenem Resistant Organisms (CRO) Any organisms meeting the above definitions for CRE, CRPA, and CRA are considered CRO.

Carbapenemase Producing Organisms (CPO) Any organisms producing carbapenemase which is laboratory-confirmed are defined as CPO.

Carbapenemase:

- *Klebsiella pneumoniae* Carbapenemase (KPC)
- Imipenemase metallo-beta-lactamase (IMP)
- New Delhi metallo-beta-lactamase (NDM)
- Verona integron-encoded metallo-beta-lactamase (VIM)
- Oxacillin Carbapenemase (OXA)

DUPLICATES Duplicates are defined as isolates from same patient, same organism, and same source within same year.

PATIENT'S RESIDENCY Patients from out of jurisdiction (OOJ) are included in the surveillance report as long as isolates meet the above surveillance definition

Major Findings:

Table1: Reported CRO by Month, Nevada, 2021

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
CRE	39	47	33	45	32	31	21	36	23	19	14	20	360
CRPA	7	6	16	6	8	14	13	13	12	16	18	19	148
CRA	3	9	6	3	6	10	9	7	2	7	9	16	87
TOTAL	49	62	55	54	46	55	43	56	37	42	41	55	595

Figure 1: Reported CRO by Month, Nevada, 2021

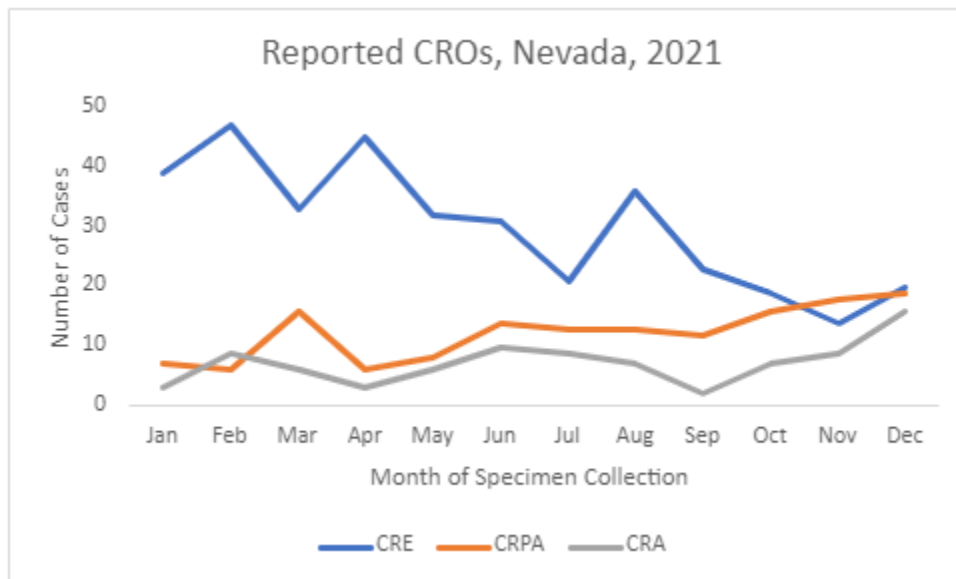


Table 1-1: Descriptive Statistics for Reported CRO Cases, Nevada, 2021

Characteristics		No.	Percent (%)
Age	Median	66	NA
	Minimum	1	NA
	Maximum	100	NA
Gender	Male	301	55.33%
	Female	243	44.67%
Specimen Type	Urine	172	33%
	Wound	102	19%
	Respiratory	77	15%

	Rectal	65	12%
	Invasive (blood, cerebrospinal fluid)	41	8%
	Other	70	13%
	Unknown	2	0
Total		529	100%

Carbapenemase Producing Organisms (CPO)

Table 2: Total CPO cases, Nevada, 2021

Resistance Mechanism	No.
NDM	14
VIM	3
KPC	148
OXA-48	1
KPC/NDM	3
Total	169

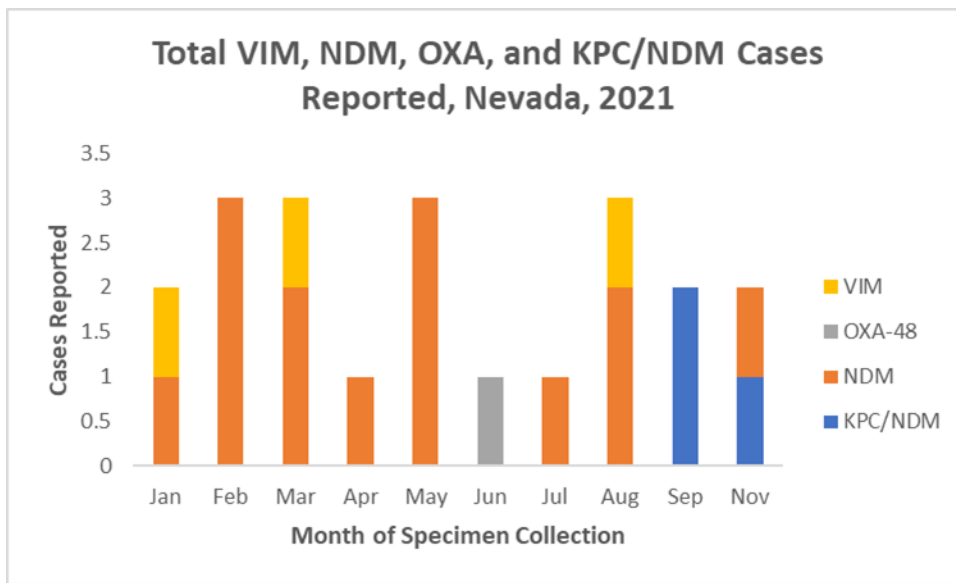
Table 2-1: Characteristics of Reported CPO Cases, VIM, NDM, and OXA-48, Nevada, 2021

Month/ Year Reported	Resistance Mechanism	Organism	Colonization/Clinical
January-21	VIM	<i>Pseudomonas putida</i>	Colonization
January-21	NDM	<i>Escherichia sp.</i>	Colonization/Clinical
February-21	NDM	<i>Klebsiella pneumoniae</i>	Clinical
February-21	NDM	<i>Klebsiella pneumoniae</i>	Clinical
February-21	NDM	<i>Klebsiella pneumoniae</i>	Clinical
March-21	VIM	<i>Pseudomonas aeruginosa</i>	Clinical
March-21	NDM	<i>Klebsiella pneumoniae</i>	Clinical
March-21	NDM	<i>Klebsiella pneumoniae</i>	Clinical
April-21	NDM	<i>Klebsiella pneumoniae</i>	Clinical - Clinical
May-21	NDM	<i>Escherichia coli</i>	Clinical
May-21	NDM	<i>Klebsiella pneumoniae</i>	Colonization
May-21	NDM	No organism listed	Clinical
June-21	OXA-48	<i>Escherichia sp.</i>	Clinical
July-21	NDM	<i>Klebsiella pneumoniae</i>	Clinical
August-21	VIM	<i>Pseudomonas aeruginosa</i>	Clinical
August-21	NDM	No organism listed	Colonization
August-21	NDM	No organism listed	Colonization
November-21	NDM	<i>Klebsiella pneumoniae</i>	Clinical

Table 2-2: Characteristics of Reported CPO Cases, Dual Mechanism, Nevada, 2021

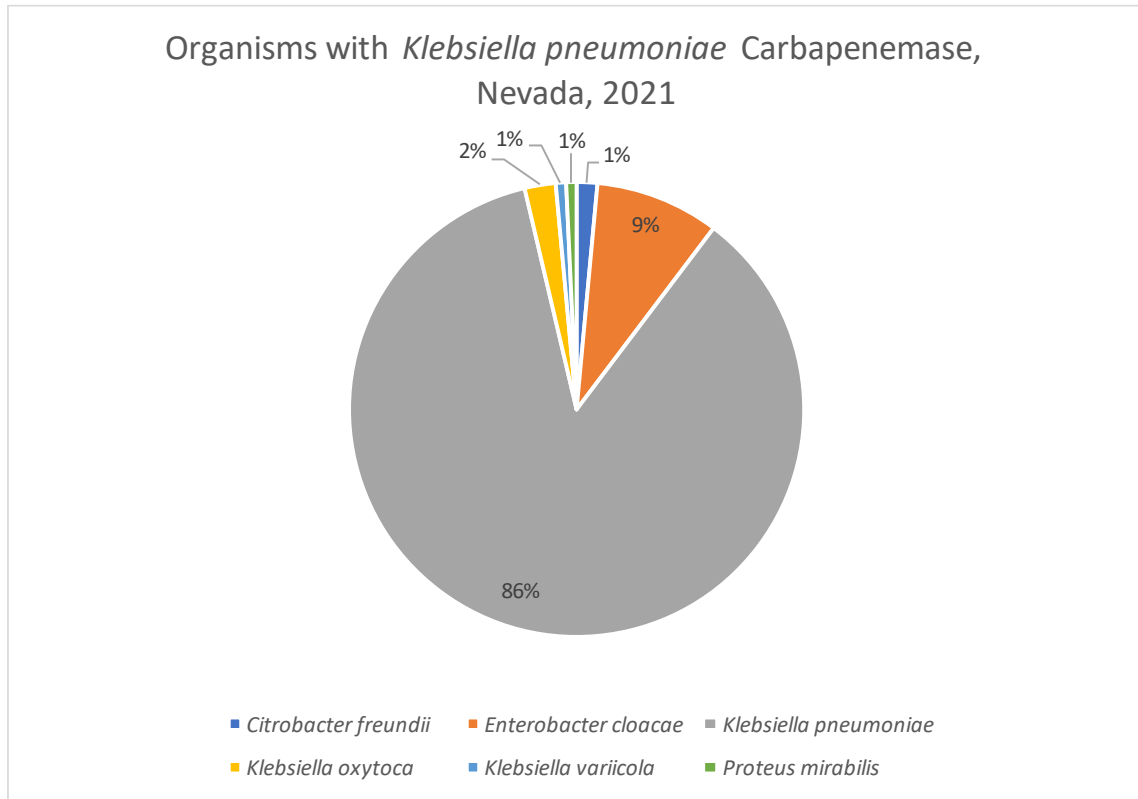
Month/Year Reported	Resistance Mechanism	Organism	Colonization/Clinical
November-21	KPC/NDM	No organism listed	Colonization
September-21	KPC/NDM	<i>Enterobacter cloacae</i>	Clinical
September-21	KPC/NDM	<i>Enterobacter cloacae</i>	Clinical

Figure 2.



VIM, OXA, NDM, and KPC/NDM cases reported 2021 = 21

Figure 2-1



KPC cases reported 2021=148. *KPC/NDM dual mechanism not included in figure/calculation.

Carbapenem Resistant Enterobacteriaceae (CRE)

Table 3: Carbapenem Resistant Enterobacteriaceae (CRE), Nevada, 2021

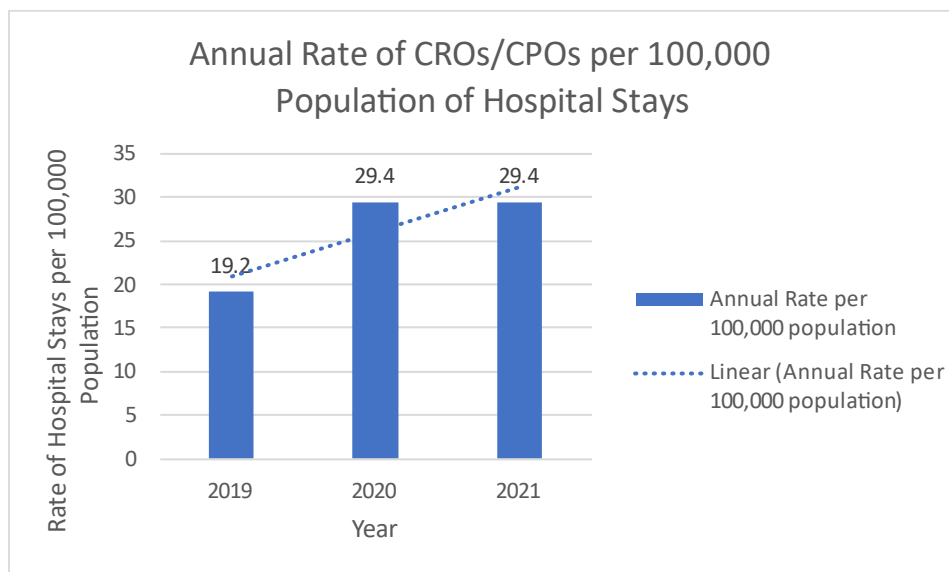
CRE Organisms	No. cases
<i>Averyella</i>	1
<i>Citrobacter sp.</i>	3
<i>Citrobacter freundii</i>	4
<i>Escherichia coli</i>	20
<i>Enterobacter hormaechei</i>	1
<i>Enterobacter sp.</i>	3
<i>Enterobacter cloacae</i>	74
<i>Escherichia sp.</i>	4
<i>Klebsiella aerogenes</i>	16
<i>Klebsiella oxytoca</i>	5
<i>Klebsiella pneumoniae</i>	205

<i>Klebsiella variicola</i>	2
<i>Kluyvera</i>	1
<i>Proteus mirabilis</i>	7
<i>Proteus vulgaris</i>	1
<i>Providencia stuartii</i>	5
<i>Serratia</i>	7
<i>Salmonella enterica</i>	1
Total	360

Reported Annual Rate of CPO/ CRO in Hospitals (2021):

The reported annual rate of CRO/CPO infections in hospitals for 2021 was 29.4 per 100000 persons

Annual Rate of CROs/CPOs per 100,000 Population of Hospital Stays 2019-2021:



SOURCE: Nevada Department of Health and Human Services - Hospital Discharge Data - [100% of the State of Nevada Hospitals]

Infection prevention practices to prevent transmission of MDROs:

- Follow **Standard Precautions** during all patient encounters in all settings in which healthcare is delivered.
- Implement **Contact Precautions** routinely for all patients infected with target MDROs and for patients that have been previously identified as being colonized with target MDROs.
- Please review additional guidelines provided by the Centers for Disease Control and Prevention on implementation of infection control based on the facility type, patient admission and placement, and enhanced environmental measures at <https://www.cdc.gov/infectioncontrol/guidelines/mdro/recommendations.html>

Reporting of MDROs

- MDRO cases can be reported to outbreak@health.nv.gov.

Acknowledgments

This report was written and compiled by Hermella Misiker, MPH and edited by Chidinma Njoku, MHA and Kimisha Causey, MPH, MSW with the Division of Public & Behavioral Health (DPBH) – Office of Public Health Investigations and Epidemiology (OPHIE) Healthcare Associated Infection (HAI) Program.

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