



2024 MASTR MDRO* & Antimicrobial Susceptibility Test Report for the year 2023 -33,500 beds	Number of occurrences in 2023	Ampicillin/Sulfactam	Ampicillin	Amoxicillin/Clavulanate	Piperacillin/Tazobactam	Aztreonam	Amikacin	Gentamicin	Tobramycin	Cefazolin	Cefotetan	Ceftriaxone <sup>2</sup>	Ceftazidime <sup>2</sup>	Cefotaxime <sup>2</sup>	Cefepime	Ciprofloxacin	Levofloxacin	Nitrofurantoin (for urine only)	Ertapenem	Meropenem	Minocycline	Trimethoprim/sulfamet	Tetracycline <sup>3</sup>																							
		A/S	AM	AUG	P/T	AZT	AK	GM	TO	CFZ	CTN	CAX <sup>2</sup>	CAZ <sup>2</sup>	CFT <sup>2</sup>	CPE	CP	LVX	FD	ETP	MER	MIN	T/S	TE <sup>3</sup>																							
<b>GRAM NEGATIVE Isolates - except urine</b>																																														
Acinetobacter baumannii cplx	105	75	56	-	-	-	-	64	66	46	53	49	55	-	-	0	0	20	22	31	34	20	15	27	29	22	21	23	26	-	-	-	-	40	48	90	85	44	50	-	-					
Enterobacter cloacae	53	0	0	0	0	0	77	75	65	75	98	100	86	96	79	96	0	0	60	72	67	77	65	74	77	89	88	89	93	92	-	-	86	91	100	100	86	85	79	92	72	77				
Escherichia coli	127	53	57	48	50	85	84	95	94	97	98	99	100	88	85	89	88	89	87	96	97	95	95	96	98	97	98	97	99	68	68	68	68	-	-	97	99	98	99	86	83	75	62	69	65	
Escherichia coli ESBL	81	18	31	0	0	60	63	92	89	0	0	97	100	68	69	65	51	-	-	97	95	0	0	0	0	0	0	0	0	13	10	15	12	-	-	98	94	100	99	87	90	42	38	47	41	
Klebsiella pneumonia ESBL	66	10	9	0	0	29	35	56	59	0	0	90	92	66	77	37	58	0	0	85	88	0	0	0	0	0	0	0	0	41	38	49	58	-	-	68	68	76	89	78	76	10	21	49	41	
Klebsiella pneumonia	93	70	78	0	0	86	86	92	90	94	94	95	98	92	94	90	91	86	90	93	96	93	92	94	95	94	96	94	97	90	90	93	95	-	-	93	96	94	97	84	86	82	87	78	80	
Morganella morganii	64	10	9	0	0	0	0	87	95	72	70	97	100	74	92	85	92	0	0	95	98	59	72	69	70	62	75	92	100	49	50	59	56	-	-	95	98	97	100	21	38	49	56	0	0	
Pseudomonas aeruginosa	571	-	-	-	-	-	95	94	79	76	-	-	-	-	96	95	-	-	-	-	-	-	-	88	86	-	-	88	86	82	83	80	85	-	-	-	93	94	-	-	-	-	-	-	-	-
Proteus mirabilis	371	81	83	71	76	96	95	98	99	83	94	99	99	88	89	88	90	86	88	99	99	99	99	100	100	99	100	99	43	52	65	65	-	-	100	99	100	100	17	16	73	76	0	0		
Proteus mirabilis ESBL	67	69	67	0	0	90	94	84	91	0	0	92	94	78	72	76	69	0	0	100	100	0	0	0	0	0	0	0	0	14	10	25	25	-	-	100	100	100	100	39	24	75	61	0	0	
Providencia stuartii	48	33	17	0	0	0	0	88	88	67	75	90	96	0	0	0	0	0	0	94	98	61	67	45	56	71	71	73	73	16	25	27	35	-	-	96	100	98	100	0	6	78	85	0	0	
Serratia marcescens	45	0	0	0	0	0	76	69	71	67	93	96	98	98	76	89	0	0	0	0	94	98	61	67	62	62	64	67	90	98	93	93	100	93	-	-	100	100	100	95	98	100	100	36	13	

Numbers with the blue background represent 2022 non-urine susceptibilities Numbers with the green and white background represent 2023 non-urine susceptibilities

GRAM NEGATIVE Isolates - URINE ONLY	A/S	AM	AUG	P/T	AZT	AK	GM	TO	CFZ	CTN	CAX <sup>2</sup>	CAZ <sup>2</sup>	CFT <sup>2</sup>	CPE	CP	LVX	FD	ETP	MER	MIN	T/S	TE <sup>3</sup>																								
A. baumannii cplx	140	51	53	-	-	-	-	-	-	-	73	66	60	49	68	56	0	0	0	0	23	23	48	39	20	19	42	34	41	24	45	26	-	-	-	48	49	76	76	56	52	22	21			
Citrobacter amalonaticus	39	-	38	-	8	-	59	-	100	-	62	-	100	-	100	-	8	-	100	-	56	-	100	-	100	-	85	-	95	-	95	-	97	-	15	-	100	-	100	-	90	-	87	-	92	
Citrobacter freundii	257	0	0	0	0	0	92	95	77	79	99	100	96	93	96	93	0	0	0	66	72	72	75	75	78	97	98	88	88	92	91	89	91	99	100	99	100	100	78	84	87	87	74	79		
Citrobacter freundii complex	159	0	0	0	0	0	93	94	70	72	100	100	98	94	98	96	0	0	0	58	58	81	79	70	70	89	87	79	74	81	75	78	77	99	99	100	100	84	84	81	79	76	72			
Citrobacter koseri	133	89	93	0	0	94	93	99	97	92	95	99	98	99	98	99	98	94	95	94	95	97	95	95	95	85	89	85	91	64	62	99	98	100	99	95	95	87	95	92	94					
Enterobacter cloacae	400	0	0	0	0	0	69	72	60	62	100	100	93	94	94	91	0	0	0	49	52	60	61	58	58	82	86	87	88	92	92	24	23	81	87	100	100	82	82	81	81	75	78			
Escherichia coli <sup>1</sup>	5805	65	66	59	59	87	87	99	98	99	99	99	99	92	93	93	94	92	91	99	99	98	98	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	
Escherichia coli ESBL	1755	31	32	0	0	67	68	94	93	0	0	98	98	70	68	62	62	0	0	97	98	0	0	0	0	0	0	0	0	14	14	14	14	87	86	98	99	99	99	99	86	85	47	46	40	40
Klebsiella aerogenes	202	0	0	0	0	0	86	83	82	70	100	99	99	95	98	98	0	0	0	64	51	74	64	75	64	92	82	92	86	94	87	30	33	97	97	99	98	91	83	91	82	86	78			
Klebsiella oxytoca	357	68	77	0	0	93	91	95	93	96	97	100	99	99	99	99	99	59	68	99	99	95	96	99	99	99	99	97	97	97	91	92	99	99	100	99	96	93	93	94	91	89				
Klebsiella oxytoca ESBL	41	11	10	0	0	46	41	84	83	0	0	97	100	38	49	35	37	0	0	100	100	0	0	0	0	0	0	0	0	46	68	65	80	65	90	100	98	100	100	76	83	22	24	27	34	
Klebsiella pneumonia	1992	82	87	0	0	94	96	96	97	98	99	99	99	98	99	97	98	96	97	98	99	97	98	96	99	98	99	95	96	97	97	54	61	98	99	98	99	99	87	87	92	93	84	84		
Klebsiella pneumonia ESBL	514	9	12	0	0	38	44	78	81	0	0	95	96	60	67	44	49	0	0	93	96	0	0	0	0	0	0	0	0	0	34	37	59	57	30	39	85	87	92	93	79	77	18	17	37	36
Morganella morganii	401	10	13	0	0	0	96	95	68	73	99	99	85	88	95	94	0	0	97	98	64	69	66	70	70	76	96	96	66	57	74	65	0	0	99	99	99	99	42	39	62	64	0	0		
Pseudomonas aeruginosa	1497	-	-	-	-	-	97	97	83	85	97	98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Proteus mirabilis	3329	88	88	79	79	95	96	99	99	91	97	99	99	89	89	90	90	90	90	99	99	98	98	99	99	99	99	99	99	57	56	69	69	0	0	99	99	99	99	14	14	80	80	0	0	
Proteus mirabilis ESBL	326	69	72	0	0	88	88	95	97	0	0	97	97	72	73	74	75	0	0	91	98	0	0	0	0	0	0	0	0	11	15	25	27	0	0	99	98	99	100	21	25	59	57	0	0	
Proteus rettgeri	93	59	49	0	0	0	83	81	50	49	100	100	92	99	95	100	0	0	98	99	91	84	44	45	94	90	95	97	87	89	90	89	0	0	97	100	98	100	28	20	87	91	0	0		
Providencia stuartii	518	36	29	0	0	0	92	92	84	81	99	99	0	0	0	0	0	0	96	96	76	70	65	60	87	80	85	84	15	14	28	23	0	0	98	98	99	99	4	3	91	89	0	0		
Proteus vulgaris	108	78	81	0	0	89	90	99	99	59	70	100	100	96	97	96	98	-	-	98																										



2024 MASTR MDRO* & Antimicrobial Susceptibility Test Report for the year 2023 ~33,500 beds	Number of occurrences in 2023	Ampicillin/Sulfbactam	Ampicillin	Amoxicillin/Clavulanate	Oxacillin	Penicillin <sup>5</sup>	Gentamicin <sup>5</sup>	Daptomycin <sup>6</sup>	Erythromycin	Clindamycin	Ceftazoxime	Ciprofloxacin	Levofloxacin	Moxifloxacin	Nitrofurantoin (for urines only)	Linezolid	Rifampin <sup>7</sup>	Streptomycin Synergy	Synercid	Trimethoprim/sulfameth	Tetracycline <sup>9</sup>	Vancomycin																					
GRAM POSITIVE Isolates- ALL except urine	A/S	AM	AUG	OX	P	GM	DAP	E	CD	CAX	CP	LVX	MXF	FD	LZD	RIF	STS	SYN	T/S	TE <sup>10</sup>	VA																						
<i>Enterococcus faecalis</i>	143	-	99	100	-	-	-	98	100	-	-	99	100	17	24	-	-	67	70	69	74	-	-	-	-	98	100	69	63	89	92	-	-	-	-	19	26	100	100				
<i>Enterococcus faecalis</i> VRE <sup>1</sup>	21	-	-	100	100	-	-	-	100	100	-	-	100	0	0	-	-	-	-	6	19	6	19	-	-	-	-	100	100	65	81	65	67	-	-	-	-	6	5	0	0		
<i>Enterococcus faecium</i> VRE <sup>1</sup>	12	-	-	0	0	-	-	-	0	0	-	-	100	100	0	0	-	-	0	0	0	0	-	-	-	-	100	100	0	0	42	42	-	-	-	-	26	17	0	0			
MRSA <sup>2</sup>	728	0	0	0	0	0	0	0	0	94	94	99	99	10	10	43	43	0	0	6	6	6	7	-	-	-	100	99	99	99	-	-	99	99	87	85	67	65	100	99			
<i>Staphylococcus aureus</i>	306	99	99	0	0	98	99	99	99	<1	97	96	99	99	44	49	65	62	98	99	56	55	52	57	-	-	-	99	99	99	99	-	-	95	100	96	99	83	88	100	99		
<i>Streptococcus pneumoniae</i> <sup>1,3</sup>	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Streptococcus agalactiae</i> -GpB	115	-	-	-	-	-	-	-	100	100	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	99

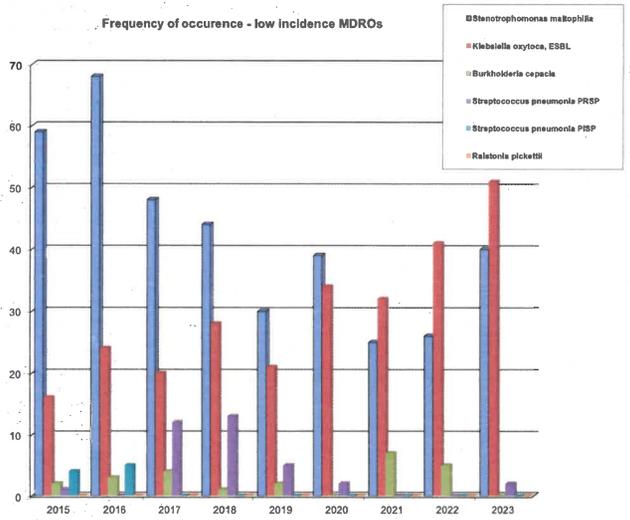
GRAM POSITIVE Isolates- URINES ONLY	A/S	AM	AUG	OX	P	GM	DAP	E	CD	CAX	CP	LVX	MXF	FD	LZD	RIF	STS	SYN	T/S	TE <sup>10</sup>	VA																							
<i>Enterococcus faecalis</i> <sup>4</sup>	780	-	-	99	99	-	-	-	99	99	-	-	100	100	-	-	68	65	70	69	-	-	8	9	8	7	-	-	100	95	100	100	69	77	65	68	-	-	-	-	10	9	0	0
<i>Enterococcus faecium</i>	86	-	-	25	24	-	-	-	27	23	-	-	97	93	-	-	23	10	24	19	-	-	23	10	24	19	-	-	73	72	100	98	15	12	73	63	-	-	-	-	41	28	99	100
<i>Enterococcus faecium</i> VRE	182	-	-	<1	<1	-	-	-	<1	<1	-	-	99	98	-	-	0	<1	0	<1	-	-	0	<1	0	<1	-	-	66	73	100	100	<1	2	61	54	-	-	-	-	11	5	0	0
<i>Staphylococcus aureus</i>	94	100	100	0	0	100	100	100	0	0	97	99	100	99	-	-	99	100	41	43	43	43	-	-	100	99	100	99	99	98	-	-	100	99	98	100	88	86	100	100				
MRSA	200	0	0	0	0	0	0	0	0	95	93	100	100	-	-	0	0	3	2	4	2	-	-	99	99	100	100	99	99	-	-	99	100	83	83	70	63	100	100					
<i>Staphylococcus epidermidis</i>	48	20	35	0	0	20	35	20	35	4	8	81	88	100	100	-	-	20	35	24	38	26	40	-	-	100	98	100	100	98	98	-	-	94	98	51	67	85	94	100	100			
<i>Streptococcus agalactiae</i> -GpB	97	-	-	-	-	-	-	-	100	100	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92	

<sup>1</sup>Note that susceptibility patterns for organism quantities less than 30 are not considered ideal for these calculations, thus are noted in gray.  
<sup>2</sup>Ceftaroline may be used only for treatment of certain cases of *Staphylococcus aureus* or *MRSA* skin and soft tissue infections.  
<sup>3</sup>The susceptibility percentages do NOT include the breakpoint value adjustments for meningitis.  
<sup>4</sup>Fosfomycin may be considered for treatment of certain *Enterococcus faecalis* urinary tract infections.  
<sup>5</sup>Gentamicin should not be used as a single agent for treatment of *MRSA* or *Staphylococcus aureus*, that are susceptible.  
<sup>6</sup>Daptomycin should not be used for isolates from the respiratory tract.  
<sup>7</sup>Rifampin should not be used alone for antimicrobial therapy for *Staphylococcus* species.  
<sup>8</sup>Penicillin susceptible staphylococci are also susceptible to other beta-lactam agents with established efficacy for staphylococcus infections. Methicillin (oxacillin) resistant staphylococcus are resistant to all currently available beta-lactam agents with the exception of ceftaroline.  
<sup>9</sup>Ampicillin susceptibility should be used to predict amoxicillin activity; amoxicillin-clavulanate, ampicillin-sulfbactam, and piperacillin/tazobactam in non beta-lactam producing enterococci; and can be used to predict imipenem susceptibility in *Enterococcus faecalis*.  
<sup>10</sup>Organisms that are susceptible to Tetracycline are also considered susceptible to doxycycline and minocycline. However, those that are intermediate or resistant to Tetracycline may be susceptible to doxycycline, minocycline or both.

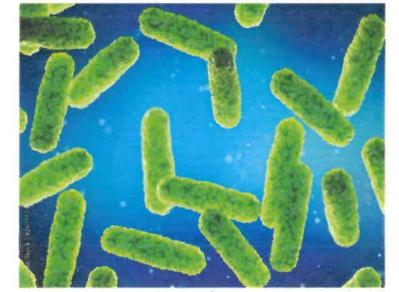
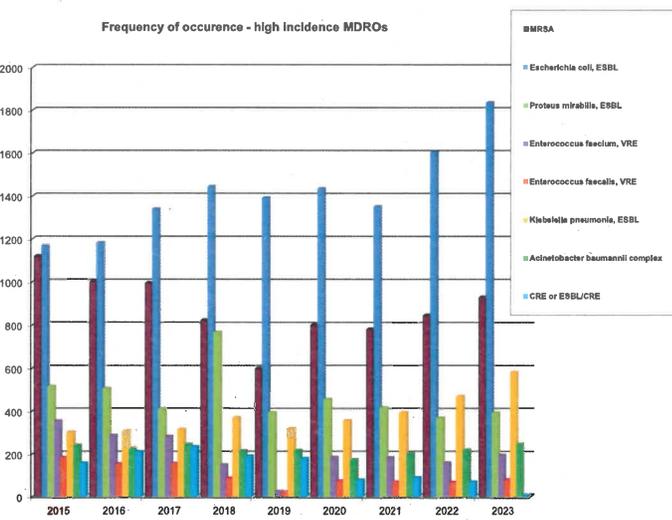
As stated by the Centers for Disease control, "For epidemiologic purposes, MDROs are defined as microorganisms, predominantly bacteria, that are resistant to one or more classes of antimicrobial agents."  
 Each row indicates an organism, categorized gram positive or gram negative, quantity isolated, and the percent susceptible to the antimicrobial (columns-see the legend on top).  
**REMARKS:** The contents of this report may be used as a benchmark. The data includes NICL Laboratories client base for the given time period.

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Frequency of occurrence - low incidence MDROs



Frequency of occurrence - high incidence MDROs



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Break the chain of infection. Practice proper hand hygiene.