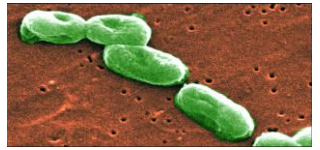
MASTR℠

NICL LABORATORIES



2021 MASTR MDRO* & Antimicrobial Susceptibility Test Report for the year 2020 - ~32,600 beds	Number of occurrences in 2019	Ampicillin/Sulfbactam		Ampicillin		Amoxacillin/Clavulanate		Piperacilin/Tazobactam [3]		Aztreonam		Amikacin		Gentamicin		Tobramycin		Cefazolin		Cefoxitin		Cefuroxime		Ceftriaxone [3]		Ceftazidime [3]		Cefotaxime [3]		Cefepime		Ciprofloxacin		Levofloxacin		Nitrofurantoin (for urines only)		Ertapenem		Imipenem		Meropenem		Trimethoprim/sulfamet		Tetracycline		Tigecycline	
GRAM NEGATIVE isolates - except urine		A/S		AM		AUG		P/T [3]		AZT		AK		GM		TO		CFZ		CFX		CRM		CAX [3]		CAZ [3]		CFT [3]		CPE		CP		LVX		FD		ETP		IMP		MER		T/S		TE		TGC	
Acinetobacter baumannii cplx	100	54	61	-	-	-	-	-	-	-	-	61	58	49	48	52	53	-	-	-	-	-	-	18	27	35	43	17	28	25	40	17	29	16	30	-	-	-	-	-	-	24	28	45	48	22	36	-	-
Enterobacter cloacae	69	0	0	0	0	0	0	80	86	72	77	99	100	88	90	86	89	0	0	-	0	-	0	61	72	71	75	68	72	87	97	86	86	93	91	-	-	87	96	-	100	100	100	81	82	83	80	-	-
Escherichia coli	131	46	51	37	45	82	77	98	92	96	99	99	99	85	90	85	88	86	84	-	96	-	90	91	98	97	99	98	98	99	99	53	64	55	64	-	-	99	99	-	98	100	99	67	73	66	70	-	-
Escherichia coli ESBL [4]	70	24	36	0	0	57	67	84	86	0	0	99	96	69	65	54	57	-	-	-	93	-	0	0	0	0	0	0	0	0	0	10	6	11	6	-	-	99	99	-	100	100	99	40	40	47	50	-	-
Klebsiella oxytoca [2]	25	72	68	0	0	96	89	96	92	96	95	100	100	96	100	100	100	48	55	-	95	-	91	96	95	100	100	100	100	100	100	96	97	96	95	-	-	100	100	-	100	100	100	92	100	92	92	-	-
Klebsiella pneumonia ESBL [4]	48	6	4	0	0	23	26	42	47	0	0	85	91	69	55	38	25	0	0	-	47	-	0	0	0	0	0	0	0	0	0	19	19	27	28	-	-	54	64	-	83	77	74	23	6	52	51	-	-
Klebsiella pneumonia	104	62	66	0	0	71	79	78	83	83	89	88	94	88	93	75	82	75	80	-	77	-	76	74	87	80	85	85	88	88	91	71	82	76	85	-	-	81	88	-	95	89	90	76	78	68	79	-	-
Morganella morganii	58	17	8	0	0	0	0	98	97	83	83	98	100	84	90	93	99	0	0	-	86	-	0	71	79	79	70	81	76	95	99	50	41	57	51	-	-	97	99	-	98	98	99	47	38	0	0	-	-
Pseudomonas aeruginosa	613	-	-	-	-	-	-	94	94	75	77	97	97	84	82	94	92	-	-	-	-	-	-	-	-	-	-	84	85	0	0	81	86	76	76	75	75	-	-	-	-	-	-	77	85	88	-	-	-	-	-
Proteus mirabilis	334	80	81	70	72	96	96	97	99	92	93	99	99	85	88	86	89	85	90	-	95	-	96	96	99	99	100	99	99	99	99	41	41	59	63	-	-	99	99	-	93	99	100	71	69	0	0	-	-
Proteus mirabilis ESBL [4]	80	60	69	0	0	95	93	96	99	0	0	90	92	59	62	60	62	0	0	-	94	-	0	0	0	0	0	0	0	0	0	11	16	32	26	-	-	100	100	-	92	100	100	45	38	0	0	-	-
Providencia stuartii	65	31	32	0	0	0	0	85	86	75	82	97	95	0	0	0	0	0	0	-	92	-	45	55	80	48	46	89	82	78	73	15	5	20	21	-	-	95	96	-	98	100	98	75	71	0	0	-	-
Serratia marcescens	49	0	0	0	0	0	0	86	78	84	75	100	100	92	98	80	78	0	0	-	0	-	0	73	73	84	75	82	75	100	97	73	88	92	93	-	-	98	98	-	100	100	100	96	98	22	32	-	-

Numbers with the purple background represent 2020 urine susceptibilities

Numbers with the orange and white background represent 2019 susceptibilities

GRAM NEGATIVE isolates - URINE ONLY		A/S		AM		AUG		P/T [3]		AZT		AK		GM		TO		CFZ		CFX		CRM		CAX [3]		CAZ [3]		CFT [3]		CPE		CP		LVX		FD		ETP		IMP		MER		T/S		TE		TGC	
A. baumannii cmplx	74	66	57	-	-	-	-	-	-	-	-	66	66	55	59	61	71	0	0	-	0	-	0	23	30	38	53	23	24	38	52	23	47	28	51	-	-	0	-	-	-	32	48	54	52	27	43	-	-
Citrobacter freundii	216	0	0	0	0	0	0	94	95	80	80	99	99	93	95	94	96	0	0	-	0	-	0	71	75	76	78	78	79	97	97	89	89	91	92	94	91	99	99	-	99	99	99	84	86	82	80	-	97
Citrobacter freundii complex	122	0	0	0	0	0	0	93	96	70	74	100	100	97	94	96	97	0	0	-	0	-	0	58	70	80	80	70	75	90	92	79	83	80	84	79	80	97	100	-	100	100	100	80	84	73	81	-	100
Citrobacter koseri	130	86	91	0	0	90	96	98	97	93	99	100	100	98	95	99	96	88	94	-	90	-	77	91	98	92	99	95	98	96	99	83	85	83	89	72	66	100	100	-	100	100	100	87	90	88	93	-	100
Klebsiella(Enterobacter) aerogenes	140	0	0	0	0	0	0	74	82	72	76	99	100	96	98	97	100	0	0	-	0	-	0	59	64	66	69	69	76	90	93	91	93	93	93	29	18	95	98	-	100	98	100	93	91	84	94	-	100
Enterobacter cloacae	388	0	0	0	0	0	0	76	74	67	62	99	99	94	96	93	95	0	0	-	0	-	0	57	52	66	61	65	56	87	90	87	88	90	91	21	22	86	91	-	100	100	99	83	81	79	79	-	94
Escherichia coli [1]	5265	63	61	56	55	87	87	98	98	99	99	99	99	91	92	92	92	91	91	91	94	93	93	98	98	99	99	99	99	99	99	67	67	68	67	96	96	99	99	99	99	99	99	76	76	73	73	100	99
Escherichia coli ESBL [4]	1366	31	29	0	0	65	69	93	95	0	0	98	98	66	67	56	59	0	0	90	88	0	0	0	0	0	0	0	0	0	0	11	11	11	12	90	89	99	99	99	100	99	99	43	41	43	41	100	99
Klebsiella oxytoca	293	79	72	0	0	94	91	96	95	97	97	99	99	98	97	99	97	60	53	-	97	-	90	96	96	100	99	99	99	100	99	96	93	98	95	94	91	99	99	-	99	100	99	94	91	89	91	-	99
Klebsiella oxytoca ESBL [2,4]	27	11	19	0	0	44	48	74	71	0	0	96	100	48	57	48	57	0	0	-	100	-	0	0	0	0	0	0	0	0	0	44	71	67	76	74	76	85	100	-	100	96	100	30	43	37	48	-	100
Klebsiella pneumonia	1662	86	84	0	0	95	93	96	95	97	97	98	99	98	98	96	95	95	94	-	91	-	90	96	96	97	96	97	97	98	97	93	93	95	94	56	52	97	96	-	97	98	97	91	90	84	85	-	98
Klebsiella pneumonia ESBL [4]	307	10	6	0	0	38	39	71	67	0	0	93	96	61	66	42	43	0	0	-	74	-	0	0	0	0	0	0	0	0	0	26	32	47	48	34	33	81	82	-	91	90	86	20	20	43	48	-	91
Morganella morganii	328	17	13	0	0	0	0	98	98	78	82	99	99	85	81	93	93	0	0	-	74	-	0	73	83	72	69	80	75	95	94	46	47	56	60	0	0	99	99	-	94	100	99	49	0	0	0	-	0
Pseudomonas aeruginosa	1212	-	-	-	-	-	-	97	97	82	82	97	97	85	85	95	95	0	0	-	0	-	0	0	0	90	92	0	0	88	91	84	83	84	84	-	-	-	-	-	-	87	93	92	-	-	-	-	-	-
Proteus mirabilis	2613	88	87	80	79	97	97	99	99	95	96	99	99	87	87	88	88	91	89	-	98	-	98	99	99	99	99	99	99	99	99	48	46	61	60	0	0	99	99	-	98	99	99	75	70	0	0	-	-
Proteus mirabilis ESBL	376	77	78	0	0	96	94	95	99	0	0	98	95	80	74	81	76	0	0	-	92	-	0	0	0	0	0	0	0	0	0	15	16	24	23	0	0	100	99	-	92	100	100	68	41	0	0	-	-
Proteus rettgeri	63	56	52	0	0	0	0	83	89	63	76	100	100	97	97	95	95	0	0	-	97	-	73	94	98	57	58	94	98	97	98	81	89	86	92	0	0	100	100	-	97	100	100	83	92	0	0	-	-
Providencia stuartii	419	35	32	0	0	0	0	94	95	84	85	98	96	0	0	0	0	0	0	-	93	-	45	72	82	63	61	89	88	85	85	13	12	25	25	0	0	99	98	-	99	100	99	88	83	0	0	-	-
Proteus vulgaris	57	81	74	0	0	84	91	98	100	74	71	100	98	95	95	100	97	0	0	-	92	-	0	46	41	96	95	75	60	98	93	79	88	79	88	0	0	100	98	-	95	100	100	86	88	0	0	-	-
Serratia marcescens	62	0	0	0	0	0	0	79	73	71	77	100	100	97	97	87	92	0	0	-	0	-	0	61	84	79	76	74	78	98	100	82	91	95	93	0	0	98	97	-	96	100	99	90	99	16	14	-	98

Numbers with the purple background represent 2020 susceptibilities

Numbers with the orange and white background represent 2019 urine susceptibilities

[1] Fosfomycin may be considered for treatment of certain Esherichia coli urinary tract infections.

[2] Note that susceptibility patterns for organism quantities less than 30 are not considered ideal for these calculations.

[3] Enterobacter, Klebsiella aerogenes, Citrobacter, and Serratia may develop resistance during prolonged therapy, therefore isolates may become resistant within 3 to 4 days after initiation of therapy. Repeat testing may be warranted.

[4] It is unclear whether treatment of an ESBL-producing isolate with a beta-lactam/beta lactamase combinatino will be effective in vivo.

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.

Gradimir B. Vuckovic, M.D., Medical Director 847 509-9779

MASTR℠

NICL LABORATORIES

2021 MASTR MDRO[a] & Antimicrobial Susceptibility Test Report for the year 2020 - ~32,600 beds

	Number of occurrences in 2019	Ampicillin/Sulfbactam		Ampicillin		Amoxacillin/Clavulanate		Oxacillin		Penicillin [a]		Gentamicin [5]		Daptomycin [6]		Erythromycin		Clindamycin		Ceftriaxone		Ciprofloxacin		Levofloxacin		Moxifloxacin		Nitrofurantoin (for urines only)		Linezolid		Rifampin [7]		Streptomycin Synergy		Synericid		Trimethoprim/sulfamet		Tetracycline		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		VA	
Enterococcus faecalis	117	-	-	100	100	-	-	-	-	100	100	-	-	100	100	15	20	-	-	-	-	57	55	57	58	-	-	-	-	100	100	67	64	83	81	-	-	-	-	21	27	100	100
Enterococcus faecalis VRE [1]	21	-	-	95	86	-	-	-	-	95	81	-	-	95	90	5	0	-	-	-	-	14	10	14	10	-	-	-	-	86	86	81	71	81	76	-	-	-	-	14	10	0	0
Enterococcus faecium VRE	27	-	-	0	0	-	-	-	-	0	0	-	-	96	100	0	0	-	-	-	-	0	0	0	0	-	-	-	-	100	100	0	7	81	59	-	-	-	-	19	22	0	0
MRSA[2]	606	0	0	0	0	0	0	0	0	0	0	95	92	98	99	6	8	34	37	0	0	5	5	6	5	13	12	-	-	98	99	97	98	-	-	98	98	92	94	69	72	100	98
Staphylococcus aureus	308	98	97	0	0	98	99	99	99	<1	<1	98	94	99	99	44	49	62	67	98	99	51	54	52	56	58	62	-	-	99	97	99	98	-	-	99	97	99	98	89	93	100	99
Staphylococcus epidermidis	87	23	15	0	0	23	15	23	15	6	8	66	59	100	100	25	33	37	50	23	15	25	22	26	23	48	38	-	-	99	100	92	94	-	-	95	98	51	40	85	77	100	100
Streptococcus agalactiae-GpB	106	-	-	-	-	-	-	-	-	100	96	-	-	100	99	-	-	-	-	-	-	-	-	87	77	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-
Streptococcus pneumonia [1,3]	4	-	-	-	-	-	-	-	-	50	33	-	-	-	-	0	33	75	67	100	100	-	-	75	67	-	-	-	-	-	-	-	-	-	-	50	67	75	67	100	100		
		Numbers with the purple background represent 2020 susceptibilities																						Numbers with the orange and white background represent 2019 susceptibilities																			
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		VA	
Enterococcus faecalis [4]	750	-	-	100	99	-	-	-	-	99	99	-	-	99	99	-	-	-	-	-	-	61	59	63	61	-	-	99	99	99	99	64	66	87	85	-	-	-	-	24	20	100	>99
Enterococcus faecalis VRE	52	-	-	96	94	-	-	-	-	96	95	-	-	96	96	-	-	-	-	-	-	2	8	2	8	-	-	98	95	96	95	85	81	67	60	-	-	-	-	10	14	0	0
Enterococcus faecium	71	-	-	24	23	-	-	-	-	23	20	-	-	94	97	-	-	-	-	-	-	20	16	25	17	-	-	52	58	100	98	21	27	82	75	-	-	-	-	20	28	87	100
Enterococcus faecium VRE	167	-	-	<1	0	-	-	-	-	<1	0	-	-	98	96	-	-	-	-	-	-	0	<1	<1	<1	-	-	48	71	99	99	4	5	83	78	-	-	-	-	10	14	0	0
Staphylococcus aureus	126	98	100	0	0	98	100	98	100	<1	0	96	96	99	100	-	-	-	-	98	99	36	38	38	39	-	-	98	100	99	100	100	99	-	-	98	100	96	99	96	92	100	100
MRSA	194	0	0	0	0	0	0	0	0	0	0	89	91	99	99	-	-	-	-	0	0	3	3	3	3	-	-	99	99	99	99	99	99	-	-	99	98	91	93	80	77	100	>99
Staphylococcus epidermidis	42	24	27	0	0	24	27	24	27	2	5	88	88	100	100	-	-	-	-	24	27	43	38	43	38	0	0	100	98	100	100	100	100	-	-	98	100	69	70	83	91	100	100
Streptococcus agalactiae-GpB	111	-	-	-	-	-	-	-	-	100	98	-	-	100	100	-	-	-	-	-	-	-	-	98	96	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-
		Numbers with the purple background represent 2020 urine susceptibilities																						Numbers with the orange and white background represent 2019 urine susceptibilities																			

[1] Note that susceptibility patterns for organism quantities less than 30 are not considered ideal for these calculations.

[2] Ceftaroline may be used for treatment of certain cases of MRSA skin and soft tissue infections.

[3] The susceptibility percentages represented here do NOT include the breakpoint value adjustments for menigitis. The susceptibility patterns for organism quantities less than 30 are not considered ideal for these calculations, thus are noted in gray.

[4] Fosfomycin may be considered for treatment of certain Enterococcus faecalis urinary tract infections.

[5] Gentamicin should not be used as a single agent for treatment of MRSA or Staphylococcus aureus.

[6] Daptomycin should not be used for isolates from the respiratory tract.

[7] Rifampin should not be used alone for antimicrobial therapy for Staphylococcus species.

Penicillin susceptible staphylococci are also susceptible to other beta-lactam agents with estabilised efficacy for staphylococcus infections. Methicillin (oxacillin) resistant staphylococcus are resistant to all currently available beta-lactam agents with the exception of cefteroline.

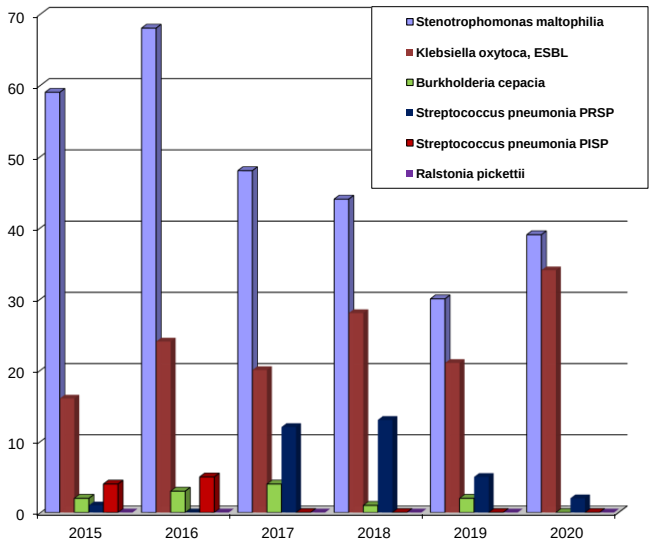
As stated by the Centers for Disease control, "For epidemiologic purposes, MDROs are defined as microorganisms, predominantly bacteria, that are resistant to one or more classes of antimicrobial agents."

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).

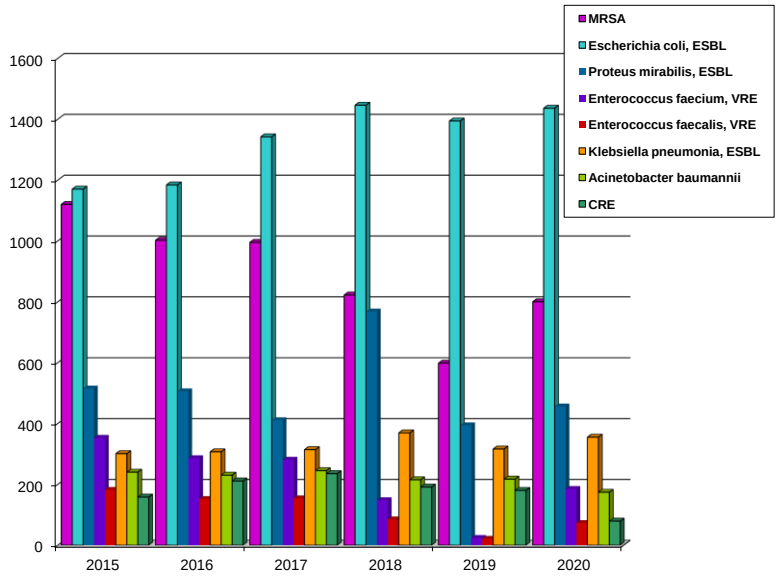
REMARKS: The contents of this report may be used as a benchmark. The data includes NICL Laboratories client base for the given time period.

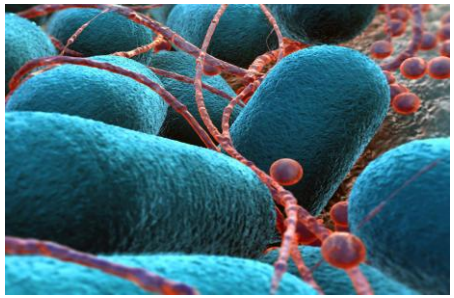
Gradimir B. Vuckovic, M.D., Medical Director 847 509-9779

Frequency of occurence - low incidence MDROs



Frequency of occurence - high incidence MDROs





NICL Laboratories

306 Era Drive
Northbrook, IL 60062
847 509-9779

www.nicl.com

Break the chain of infection. Practice proper hand hygiene.