



2012 MASTR MDRO* & Antimicrobial Susceptibility Test Report for the year 2011 ~30,000 beds	Number of occurrences 2011	Ampicillin/Sulbactam	Ampicillin	Augmentin	Oxacillin	Penicillin	Piperacillin/Tazobactam	Aztreonam	Amikacin	Gentamicin	Tobramycin	Erythromycin	Clindamycin	Cefazolin	Cefoxitin	Cefturoxime	Ceftriaxone	Ceftazidime	Cefotaxime	Cefepime	Cephalothin	Ciprofloxacin	Levofloxacin	Moxifloxacin	Nitrofurantoin	Ertapenem	Imipenem	Meropenem	Linezolid	Rifampin	Streptomycin Synergy	Synercid	Trimethoprim/sulfamet	Tetracycline	Vancomycin	Tigecycline
		A/S	AM	AUG	OX	P	PIT	AZT	AK	GM	TO	E	CD	CAX	CAZ	CFT	CPE	CP	LVX	MXF	FD	ETP	IMP	MER	LZD	RIF	STS	SYN	T/S	TE	VA	TGC				

Gram Positive isolates- all sources

	A/S	AM	AUG	OX	P	GM	E	CD	CAX	CP	LVX	MXF	FD	LZD	RIF	STS	SYN	T/S	TE	VA																					
Enterococcus faecalis	1589	-	99	99	-	99	99	-	19	14	-	-	34	38	38	44	-	97	99	94	98	77	73	69	72	2	-	-	-	19	21	99	99								
Enterococcus faecalis VRE	272	-	89	83	-	87	79	-	6	5	-	-	5	4	5	4	-	89	89	81	80	76	68	73	78	<1	<1	-	-	27	36	0	0								
Enterococcus faecium	124	-	31	30	-	31	27	-	26	53	-	-	16	15	22	23	-	50	39	90	94	27	25	64	69	74	75	-	-	38	41	99	98								
Enterococcus faecium VRE	564	-	5	2	-	6	2	-	2	1	-	-	<1	<1	1	<1	-	49	44	92	95	9	8	48	58	92	94	-	-	27	19	0	0								
Enterococcus raffinosus	58	-	20	45	-	13	29	-	8	22	-	-	7	16	7	19	-	86	96	91	100	86	81	12	29	10	21	-	-	51	38	36	29								
MRSA	1654	0	0	0	0	0	0	0	0	88	90	6	6	44	43	0	8	10	9	11	33	33	99	100	95	92	97	98	-	-	95	93	92	94	73	77	99	99			
Streptococcus agalactiae-GpB	639	-	-	-	-	93	96	-	-	-	-	-	89	93	-	-	-	87	98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Streptococcus pneumonia	11	-	-	-	-	71	78	-	-	-	-	-	94	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100					
Staphylococcus aureus	689	93	96	15	0	94	99	100	100	22	26	89	95	43	49	75	65	96	99	54	53	58	55	71	75	96	100	91	89	97	98	-	-	92	94	96	98	90	89	100	100
Staphylococcus auricularis	44	52	57	21	0	45	55	52	59	26	25	84	68	21	29	72	37	35	57	28	39	34	36	52	43	-	67	91	91	91	91	-	-	78	93	77	80	78	75	100	93
Staphylococcus bovis	42	-	-	-	-	85	95	-	-	-	-	-	62	81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	98		
Staphylococcus epidermidis	308	19	19	3	0	18	18	19	19	4	6	60	59	20	23	46	39	18	18	14	19	13	18	33	31	95	99	91	95	95	96	-	-	93	95	42	46	88	83	100	98
Staphylococcus haemolyticus	47	34	34	18	0	25	34	34	34	18	26	59	55	14	3	57	30	27	34	32	17	30	17	46	37	94	94	93	96	93	96	-	-	93	98	57	55	73	85	100	96
Staphylococcus hominis-hominis	84	26	37	10	0	22	36	27	38	12	18	66	68	11	12	52	32	20	36	17	40	22	38	35	46	82	100	95	94	96	96	-	-	90	94	51	53	58	65	100	96
Staphylococcus simulans	35	71	50	17	0	71	50	71	50	29	12	94	88	33	11	50	11	69	44	34	35	40	35	50	44	97	100	97	100	97	97	-	-	97	100	97	94	91	91	100	100

Numbers with the lilac background represent 2010 susceptibilities

Numbers with the blue and white background represent 2011 susceptibilities

Gram Negative isolates - all sources

	A/S	AM	AUG	PIT	AZT	AK	GM	TO	CFZ	CFX	CRM	CAX	CAZ	CFT	CPE	CP	LVX	FD	ETP	IMP	MER	T/S	TE	TGC																										
Acinetobacter Iwofii	75	78	65	-	-	-	-	-	-	94	95	94	95	94	99	-	-	-	-	-	75	67	82	76	74	60	77	65	82	64	83	87	-	-	-	-	-	79	73	86	79	88	87	-	-					
Acinetobacter baumann/haemolyticus	294	28	40	-	-	-	-	-	42	40	34	32	38	38	-	-	11	16	36	36	8	14	20	25	14	14	14	-	-	-	-	-	-	-	-	20	18	26	27	25	29	-	-							
Citrobacter amalonaticus	52	52	56	14	19	71	67	97	94	68	62	97	98	89	90	84	87	27	29	84	77	25	27	76	94	100	89	83	97	92	86	71	86	73	40	41	97	98	98	100	100	83	83	79	81	-	98			
Citrobacter freundii complex	425	42	0	25	0	12	0	93	95	83	82	98	98	92	92	92	91	4	0	5	0	40	0	83	83	82	83	84	85	97	97	86	83	89	87	93	94	98	99	99	100	95	96	85	82	82	78	-	99	
Citrobacter koseri	166	54	0	<1	0	56	0	91	91	92	89	98	98	94	93	93	89	88	86	75	74	68	64	94	93	94	93	92	95	91	93	65	61	67	63	71	62	99	98	100	99	100	96	67	64	91	93	-	100	
Enterobacter aerogenes	146	18	0	4	0	5	0	80	73	79	71	91	95	92	93	90	88	5	0	4	0	24	0	75	66	72	68	80	65	88	83	84	82	86	84	11	14	95	90	95	94	82	89	84	80	77	-	95		
Enterobacter cloacae	383	12	0	5	0	3	0	74	80	65	65	96	97	88	89	87	86	1	0	2	0	13	0	60	65	64	68	60	65	83	81	78	76	84	83	22	19	94	96	99	98	98	100	77	74	74	68	-	90	
Escherichia coli	6418	50	51	45	46	80	80	95	96	98	97	99	99	85	87	83	85	86	85	90	90	90	89	99	99	99	99	99	99	99	99	48	50	49	51	96	95	99	99	99	99	99	100	99	65	65	68	68	-	99
Escherichia coli ESBL	894	16	19	0	0	43	47	82	82	0	0	89	89	73	76	45	50	0	0	74	77	0	0	0	0	0	0	0	0	0	0	10	8	11	8	91	89	97	97	99	99	100	99	44	39	38	36	-	99	
Klebsiella oxytoca	211	60	70	1	0	91	94	94	94	89	88	99	99	97	97	96	94	34	31	95	95	77	73	96	94	98	98	98	99	99	92	91	96	96	83	78	98	98	99	98	100	96	94	94	91	91	-	99		
Klebsiella oxytoca ESBL	20	6	25	0	0	18	25	41	30	0	0	82	90	76	85	59	65	0	0	82	75	0	0	0	0	0	0	0	0	0	0	71	65	71	65	69	68	100	90	94	95	100	100	59	65	76	80	-	90	
Klebsiella pneumonia ESBL	284	11	6	0	0	32	26	35	32	0	0	57	57	63	69	17	17	0	0	52	44	0	0	0	0	0	0	0	0	0	15	8	23	11	13	8	63	56	81	70	69	52	17	13	66	62	-	92		
Klebsiella pneumonia	1894	82	82	<1	0	91	90	93	92	95	94	95	96	97	97	93	93	90	89	87	87	88	88	96	95	96	95	96	95	96	95	89	90	91	90	41	37	95	95	97	96	89	85	88	88	83	83	-	95	
Morganella morganii	468	16	15	4	0	12	0	94	95	75	72	96	98	72	75	80	84	6	0	65	65	12	0	83	83	55	56	64	66	89	92	32	32	41	43	<1	0	98	98	92	86	98	95	30	34	28	34	-	50	
Pseudomonas aeruginosa	1756	-	-	-	-	-	88	90	66	64	90	90	69	68	84	83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Proteus mirabilis	2348	78	78	70	69	94	94	97	98	87	87	96	99	79	78	78	79	78	77	95	96	97	97	98	99	98	99	97	98	35	35	51	51	<1	0	98	99	96	94	99	99	61	56	<1	<1	-	-			
Proteus penneri	17	34	29	3	0	79	71	97	82	69	65	97	94	69	76	66	76	7	0	90	82	28	35	55	53	93	76	7																						

	2008		2009		2010		2011	
	MDRO	% of Total Isolates	MDRO	% of Total Isolates	MDRO	% of Total Isolates	MDRO	% of Total Isolates
MRSA	2626	9.31%	1932	7.52%	1615	7.00%	1654	7.46%
Escherichia coli, ESBL*	1041	3.69%	786	3.06%	762	3.30%	894	4.03%
Proteus mirabilis, ESBL*	695	2.46%	624	2.43%	610	2.64%	534	2.41%
Enterococcus faecium, VRE	458	1.62%	409	1.59%	475	2.06%	564	2.55%
Enterococcus faecalis, VRE	298	1.06%	268	1.04%	239	1.04%	272	1.23%
Klebsiella pneumonia, ESBL*	257	0.91%	269	1.05%	296	1.28%	284	1.28%
Acinetobacter baumannii/haemolyticus**	229	0.81%	226	0.88%	184	0.80%	204	0.92%
Stenotrophomonas maltophilia	55	0.19%	74	0.29%	56	0.24%	52	0.23%
Klebsiella oxytoca, ESBL	20	0.07%	22	0.09%	17	0.07%	20	0.09%
Burkholderia cepacia	11	0.04%	12	0.05%	13	0.06%	10	0.05%
Enterococcus faecium group, VRE	1	0.00%	0	0.00%	0	0.00%	0	0.00%
Streptococcus pneumonia PRSP	1	0.00%	1	0.00%	1	0.00%	2	0.01%
Ralstonia pickettii	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Streptococcus pneumonia PISP	0	0.00%	6	0.02%	4	0.02%	3	0.01%
	28207		25676		23083		22158	

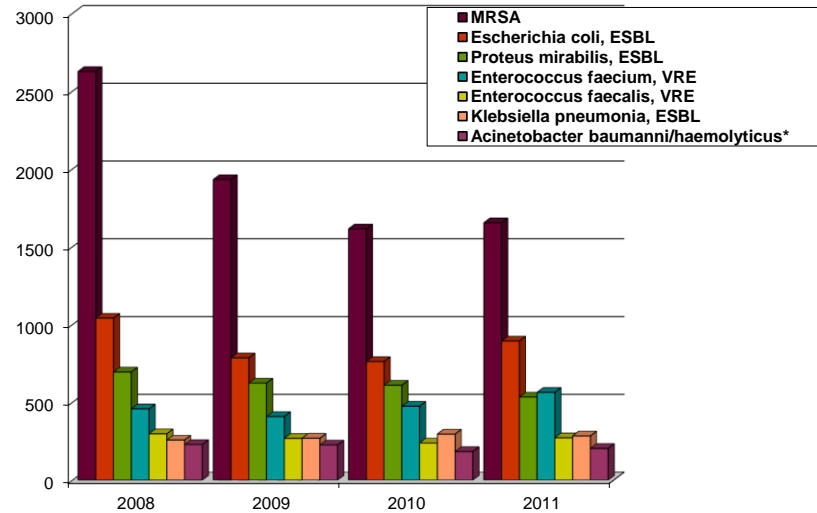
* These 2011 numbers include a total of 243 Carbapenem Resistant Enterobacteriaceae.

**Resistant to all antimicrobials, or all but imipenem.

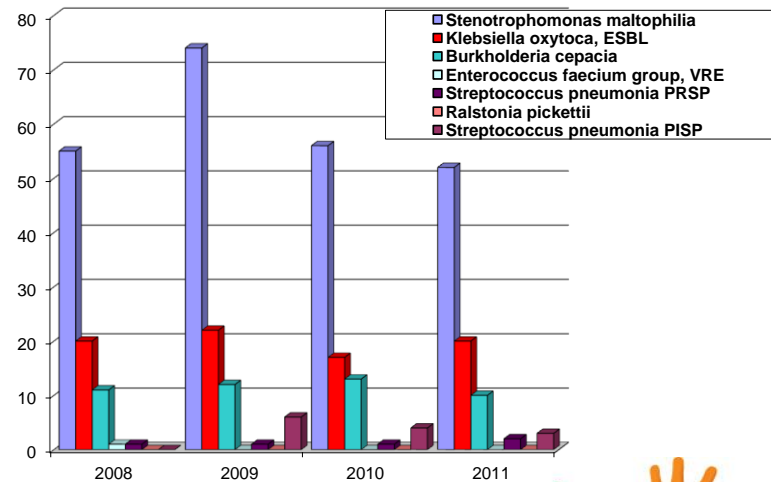
Center for Disease Control guidelines for the definition of Multiple Drug Resistant Organisms (MDROs) reads, "For epidemiologic purposes, MDROs are defined as microorganisms, predominantly bacteria, that are resistant to one or more classes of antimicrobial agents. Although the names of certain MDROs describe resistance to only one agent (e.g., MRSA, VRE), these pathogens are frequently resistant to most available antimicrobial agents. These highly resistant organisms deserve special attention in healthcare facilities..." These organisms are:

- > Methicillin Resistant *Staphylococcus aureus* (MRSA),
- > Vancomycin Resistant *Enterococci* (VRE any species),
- > Extended Spectrum Beta Lactamases (ESBLs, which are found in *Klebsiella pneumonia*, *Klebsiella oxytoca*, *Escherichia coli*, and *Proteus mirabilis*),
- > *Acinetobacter baumannii*, and *Acinetobacter baumannii/haemolyticus* resistant to all antimicrobials, or all but imipenem,
- > *Stenotrophomonas maltophilia*,
- > *Burkholderia cepacia*, and
- > *Ralstonia pickettii*.
- > *Streptococcus pneumoniae* that are resistant to penicillin and other broad-spectrum agents (MDRSP), are considered MDRO in residential settings.
- > Strains of *Staphylococcus aureus* that have intermediate (VISA) or are resistant (VRSA) to Vancomycin have also been isolated.

Frequency of occurrence - high incidence MDROs



Frequency of occurrence - low incidence MDROs



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Break the chain of infection. Practice proper hand hygiene.