

**ANTIBIOGRAM FOR SELECTED BACTERIA
 OF PUBLIC HEALTH AND CLINICAL IMPORTANCE
 ISOLATED BY CLINICAL LABORATORIES IN MONTANA
 JANUARY – DECEMBER, 2011**

The Montana Department of Public Health and Human Services has conducted antimicrobial susceptibility surveillance and provided a statewide antibiogram since 2005. Thirty two Montana laboratories provided antimicrobial susceptibility data from testing performed January 1, 2011 through December 31, 2011, for over 37,000 bacterial isolates. These data were compiled to create a statewide antibiogram using the methodology described by the Clinical and Laboratory Standards Institute (CLSI), in document M39-A3, *Analysis and Presentation of Cumulative Antimicrobial Susceptibility Test Data; Approved Guideline*.¹

Rare and improbable susceptibility patterns continue to be reported. In some cases, the occurrence of even one of these susceptibility patterns would be of public health significance. These results raise a concern over possible errors in methodology, a concern that is exacerbated by the fact that none of the isolates were referred for confirmatory testing. It is important that laboratorians understand the potential significance of unusual resistance patterns so deviations from the expected will be recognized and reported. This can be accomplished by reviewing intrinsic resistance tables in CLSI document M-100, *Performance Standards for Antimicrobial Susceptibility Testing*² and by consulting statewide data. Invalid results may have significant impact on treatment of individual patients and on public health outcomes. In most instances, unexpected or improbable data do not affect the average percentage rates for the state-wide antibiogram, but they do convey potentially erroneous susceptibility data to local providers

Of greatest concern is the continued reporting of vancomycin-resistant *Staphylococcus aureus*. Although twelve *S. aureus* isolates were reported as vancomycin resistant in 2011, none were referred to the public health laboratory for confirmation and further testing. Other improbable results included 84 isolates of *Klebsiella pneumoniae* reported as ampicillin-susceptible, 237 *Pseudomonas aeruginosa* isolates reported as cefepime-resistant, and susceptibility levels for specific antimicrobial agents that were significantly different from the state average.

Since 2006, the statewide proportion of methicillin resistant *Staphylococcus aureus* (MRSA) isolates has steadily decreased from 40% to 33% of total *Staphylococcus aureus*. (Figure 1) Data from both 2010 and 2011 indicate a significantly higher than average occurrence of MRSA across the northern region of the state. (Figure 2)

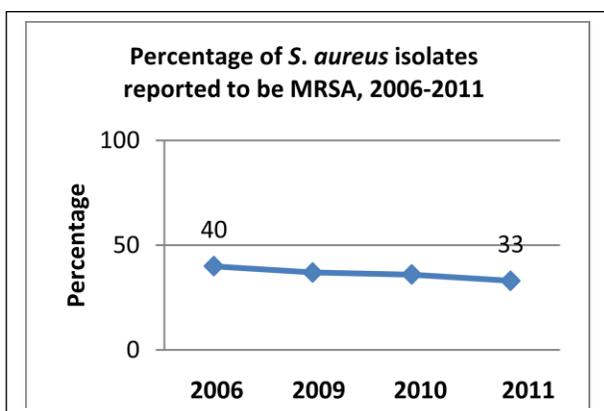


Figure 1

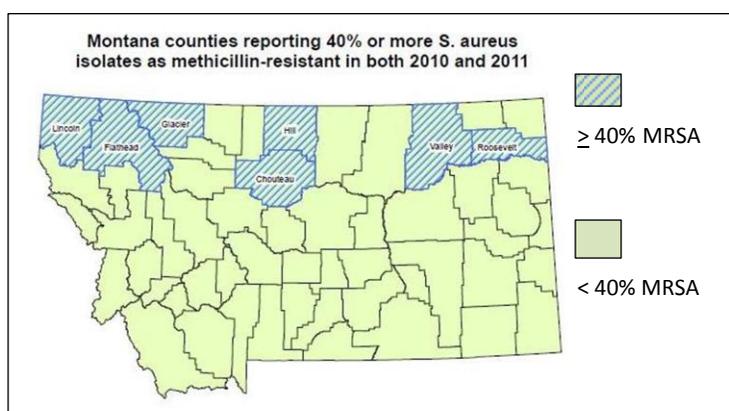


Figure 2

The state antibiogram is presented for surveillance purposes only and should not be used as the primary basis for determining antimicrobial therapy for individual patients.

The following tables summarize the susceptibility patterns for select bacteria of public health and clinical importance. An asterisk (*) following a number indicates that data were received from five or fewer laboratories. Data received from a single laboratory are not included. Agents tested against fewer than 100 isolates are not included. Red numbers reflect total isolates tested against each agent.

¹CLSI, *Analysis and Presentation of Cumulative Antimicrobial Susceptibility Test Data; Approved Guideline-Third Edition*. CLSI document M39-A3. Wayne, PA: Clinical and Laboratory Standards Institute; 2009.

²CLSI, *Performance Standards for Antimicrobial Susceptibility Testing; Twenty Second Informational Supplement*. CLSI document M100-S22. Wayne, PA: Clinical and Laboratory Standards Institute; 2012.

2011 Montana Antibioqram

Red :# of isolates tested Black:
percent susceptible

2011 Gram Positive Isolates	# of isolates all sources	penicillins			Single Agent Classes							cephems		quinolones		Single Agent Classes			quinolones		Single Agent Classes	
		Penicillin	Ampicillin	Oxacillin	Trimethoprim-Sulfamethoxazole	Rifampin	Vancomycin	Tetracycline	Linezolid	Daptomycin	Quinupristin-Dalfopristin	Cefotaxime	Ceftriaxone	Levofloxacin	Moxifloxacin	Azithro, Clarithro, or Erythromycin	Erythromycin	Clindamycin	Ciprofloxacin	Levofloxacin	Nitrofurantoin	Tetracycline
		All isolates Percent Susceptible													Non-Urine Percent Susceptible			Urine Percent Susceptible				
<i>S aureus</i> non-differentiated	3331	1088 10		3157 63	1938 98	1724 99	1904 100	1750 95	1871 100						747 39		747 80				136 98*	
<i>S aureus</i> oxacillin-susceptible	4630	1626 13		4624 100	4534 99	4524 100	4624 100	4554 96	4609 100	122 100					3835 79		3939 92				263 96	
<i>S aureus</i> oxacillin-resistant	2035	1336 0		2030 0	1940 98	1980 98	2030 100	1781 97	1538 99						1672 13		1672 70				114 96	
<i>Enterococcus spp</i>	1008	836 83	709 95				836 98		189 99*				300 16*					528 86	517 91	526 93	498 83*	
<i>E. faecalis</i>	2674	2029 95	2639 9				2674 99		2600 97	115 97	840 0							533 62	609 66	1207 98	589 22	
<i>E. faecium</i>	284	231 17	284 22				284 51		279 97												106 12	
<i>S. pneumoniae</i>	527	303 63			421 74		508 74	490 85							185 86	452 93	279 95	128 96*		421 64		



MONTANA 2011 ANTIBIOGRAM

Data collection: January 1 through December 31, 2011.
This antibiogram reflects data submitted by 32 clinical laboratories in Montana. These data should not be used for the determination of therapy for individual patients.

2011 Gram Negative Isolates	# of isolates all sources	aminoglycoside			b-lactam/b-lactamase inhibitor				cephems						quinolones		carbapenems			Single Agent Classes		penicillins		Single Agent Classes			folate pathway inhibitors		
		Gentamicin	Tobramycin	Amikacin	Amoxicillin-Clavulanic Acid	Ampicillin-Sulbactam	Piperacillin-Tazobactam	Ticarcillin-Clavulanic Acid	Cefazolin	Cefuroxime	Cefepime	Ceftazidime	Cefotetan	Cefoxitin	Cefotaxime or Ceftriaxone	Ciprofloxacin	Levofloxacin	Ertapenem	Imipenem	Meropenem	Trimethoprim-Sulfamethoxazole	Aztreonam	Piperacillin	Ampicillin	Cephalothin	Norfloxacin	Nitrofurantoin	Sulfisoxazole	Trimethoprim
		All Isolates Percent Susceptible																							Urine Percent susceptible				
<i>E. coli</i>	20329	19196 95	16447 95	14206 99	6965 88	18450 71	7457 94	1850 90	18878 90	6620 97	18624 94		944 100*	10281 93	17246 97	19291 85	12360 85	15651 100	19196 100	1846 100	17647 82		2284 58	19291 61	2539 78	3205 22	9922 96	930 82*	1276 85*
<i>K. pneumoniae</i>	3588	3450 98	2963 98	2537 99	1192 98	3010 91	1796 92	309 99	3429 94	426 95	3363 97		153 100*	1837 95	3115 98	3450 96	2179 96	2807 100	3450 100	353 100	3260 91		291 34	2479 3	389 91	157 94*	1624 45	144 96*	170 97
<i>Proteus</i>	1167	1117 89	757 93	841 100	392 98	982 90	646 99	127 96	1111 88	144 94	1094 95			736 97	1078 98	1124 82	726 88	1013 100	480 95	140 100	899 76			894 75	111 92		549 4		
<i>P. aeruginosa</i>	2194	2186 77	1858 96	1651 93			1542 94						2139 88	1098 92				2154 78	1353 71				261 73	150 95					

**MONTANA
2010
ANTIBIOGRAM**

|