

Year 2016 2017 2018 2019 2020 2021 2022 2023

MSH Blood Culture Specimens: % Susceptibility

Gram Negative Organisms

	2016	2017	2018	2019	2020	2021	2022	2023	# isolates
<i>Escherichia coli (excluding ESBL)</i>		131	163	163	145	161	161	172	
Ampicillin		61	64	53	57	57	60	60	
Amoxicillin/Clavulanic acid			85	82	85	84	84	95	
Cefazolin		89	81	69	68	60	75	78	
Ceftriaxone		98	97	97	95	98	98	97	
Ceftazidime		97	97	98	96	97	97	97	R
Piperacillin/Tazobactam		96	98	96	97	94	97	98	
Ertapenem		99	100	100	100	100	99	99	
Meropenem		100	100	100	100	100	99	99	
Gentamicin		92	91	90	92	93	92	94	
Tobramycin		91	92	92	95	93	94	98	
Amikacin		100	100	100					
Trimethoprim/Sulfamethoxazole		82	85	78	83	78	81	78	
Ciprofloxacin		76	82	78	72	68	75	79	
<i>Escherichia coli (ESBL)</i>							28	32	# isolates
Ampicillin							0	0	
Amoxicillin/Clavulanic acid							50	100	
Cefazolin							0	0	
Ceftriaxone							0	0	
Ceftazidime							4	0	
Piperacillin/Tazobactam							93	100	
Ertapenem							100	100	
Meropenem							100	100	
Gentamicin							79	56	
Tobramycin							71	64	
Trimethoprim/Sulfamethoxazole							61	53	
Ciprofloxacin							25	7	
<i>Escherichia coli (including ESBL)</i>	61	159	189	201	172	184	188	203	# isolates
Ampicillin	52	50	56	43	48	49	51	50	
Amoxicillin/Clavulanic acid			82	79	82	85	80	95	
Cefazolin	89	72	69	56	57	53	64	63	
Ceftriaxone	95	80	83	78	80	85	83	82	
Ceftazidime	95	79	83	79	85	85	84	82	
Piperacillin/Tazobactam	95	96	97	95	97	95	96	98	
Ertapenem	100	99	100	100	100	100	99	99	
Meropenem	100	100	100	100	100	100	99	99	
Gentamicin	97	87	89	90	90	90	90	88	
Tobramycin	97	83	88	90	92	91	91	93	
Amikacin	100	99	99	100					
Trimethoprim/Sulfamethoxazole	77	73	78	72	79	75	78	74	
Ciprofloxacin	79	67	74	70	66	60	68	68	

Year	2016	2017	2018	2019	2020	2021	2022	2023	
<i>Klebsiella pneumoniae (excluding ESBL)</i>							49	50	# isolates
Ampicillin							R	R	
Amoxicillin/Clavulanic acid							98	98	
Cefazolin							98	98	
Ceftriaxone							100	98	
Ceftazidime							100	98	R
Piperacillin/Tazobactam							100	98	
Ertapenem							100	98	
Meropenem							100	100	
Gentamicin							100	98	
Tobramycin							100	98	
Trimethoprim/Sulfamethoxazole							92	96	
Ciprofloxacin							100	96	
<i>Klebsiella pneumoniae (ESBL)</i>							5	2	# isolates
Ampicillin							R	R	
Amoxicillin/Clavulanic acid							40	50	
Cefazolin							0	0	
Ceftriaxone							0	0	
Ceftazidime							0	0	
Piperacillin/Tazobactam							60	50	
Ertapenem							100	100	
Meropenem							100	100	
Gentamicin							80	50	
Tobramycin							60	50	
Amikacin									
Trimethoprim/Sulfamethoxazole							0	0	
Ciprofloxacin							20	0	
<i>Klebsiella pneumoniae (including ESBL)</i>	17	33	36	58	51	51	54	52	# isolates
Ampicillin	R	R	R	R	R	R	R	R	
Amoxicillin/Clavulanic acid			94	97	92	94	93	96	
Cefazolin	82	94	86	86	84	78	89	93	
Ceftriaxone	88	94	92	93	96	94	91	94	
Ceftazidime	88	94	92	95	96	94	91	94	
Piperacillin/Tazobactam	88	100	92	100	92	96	96	96	
Ertapenem	100	100	97	100	100	100	100	98	
Meropenem	100	100	97	100	100	100	100	100	
Gentamicin	88	97	92	98	100	100	98	96	
Tobramycin	82	97	92	98	98	96	96	96	
Amikacin	100	100	100	100					
Trimethoprim/Sulfamethoxazole	82	91	94	90	94	92	83	92	
Ciprofloxacin	82	100	86	93	84	86	93	94	

Year	2016	2017	2018	2019	2020	2021	2022	2023	
<i>Enterobacter spp</i>	7	13	16	17	17	13	10	11	# isolates
Ampicillin		R	R	R	R	R	R	R	
Amoxicillin/Clavulanic acid			6	6	0	0	0	0	
Cefazolin	R	R	R	R	R	R	R	R	
Ceftriaxone	71	62	63	76	65	92	50	80	
Ceftazidime	71	62	63	82	63	92	50	91	R
Piperacillin/Tazobactam	83	67	64	88	71	92	50	82	
Ertapenem	100	100	81	88	76	92	80	100	
Meropenem	100	100	94	100	100	100	100	100	
Gentamicin	86	85	100	94	100	100	100	100	
Tobramycin	86	85	100	94	100	100	100	100	
Amikacin	100	100	100	100					
Trimethoprim/Sulfamethoxazole	86	92	94	94	100	92	100	100	
Ciprofloxacin	86	92	100	100	100	100	100	100	
<i>Klebsiella aerogenes</i>							4	5	# isolates
Ampicillin							R	R	
Amoxicillin/Clavulanic acid							0	1	
Cefazolin							R	R	
Ceftriaxone							100	60	
Ceftazidime							100	60	
Piperacillin/Tazobactam							100	60	
Ertapenem							75	80	
Meropenem							100	100	
Gentamicin							100	100	
Tobramycin							100	100	
Trimethoprim/Sulfamethoxazole							100	100	
Ciprofloxacin							100	100	
<i>Pseudomonas aeruginosa</i>	9	21	23	21	22	23	28	23	# isolates
Ampicillin									
Amoxicillin/Clavulanic acid			R	R	R	R	R	R	
Cefazolin									
Ceftriaxone									
Ceftazidime	89	95	91	81	91	91	89	86	
Piperacillin/Tazobactam	89	100	91	90	91	91	89	100	
Ertapenem									
Meropenem	100	100	87	86	100	91	93	95	
Gentamicin	100	100	100	100	95	100	100	100	
Tobramycin	100	100	100	100	100	100	100	100	
Amikacin	100	100	100	100					
Trimethoprim/Sulfamethoxazole									
Ciprofloxacin	100	100	100	95	95	100	96	100	

Year	2016	2017	2018	2019	2020	2021	2022	2023	
Klebsiella pneumoniae (excluding ESBL)							164	206	# isolates
Ampicillin							R	R	
Amoxicillin/Clavulanic acid							96	99	
Cefazolin							96	98	
Ceftriaxone							99	99	
Ceftazidime							99	99	R
Piperacillin/Tazobactam							98	99	
Ertapenem							99	100	
Meropenem							100	100	
Gentamicin							99	100	
Tobramycin							99	100	
Nitrofurantoin							30	74	
Trimethoprim/Sulfamethoxazole							92	95	
Ciprofloxacin							92	96	
Klebsiella pneumoniae (ESBL)							12		# isolates
Ampicillin							R		
Amoxicillin/Clavulanic acid							50		
Cefazolin							0		
Ceftriaxone							0		
Ceftazidime							0		
Piperacillin/Tazobactam							50		
Ertapenem							83		
Meropenem							100		
Gentamicin							83		
Tobramycin							67		
Nitrofurantoin							0		
Trimethoprim/Sulfamethoxazole							17		
Ciprofloxacin							8		
Klebsiella pneumoniae (including ESBL)	97	169	129	150	157	133	176	230	# isolates
Ampicillin		R	R	R	R	R	R	R	
Amoxicillin/Clavulanic acid			91	91	95	93	93	97	
Cefazolin		92	86	89	91	89	90	88	
Ceftriaxone	98	92	88	91	92	91	92	88	
Ceftazidime	98	92	87	91	93	92	92	89	
Piperacillin/Tazobactam	94	96	92	94	97	98	94	99	
Ertapenem	99	99	98	99	99	99	98	100	
Meropenem	99	99	98	99	99	100	100	100	
Gentamicin	99	94	93	97	99	97	98	96	
Tobramycin	99	91	91	97	98	96	97	98	
Amikacin	100	99	100	99					
Nitrofurantoin	45	39	35	29	28	27	28	68	
Trimethoprim/Sulfamethoxazole	95	87	85	89	90	90	87	87	
Ciprofloxacin	97	91	91	90	87	82	86	88	

Year	2016	2017	2018	2019	2020	2021	2022	2023	
<i>Enterobacter spp</i>	24	27	47	38	34	34	35	42	# isolates
Ampicillin		R	R	R	R	R	R	R	
Amoxicillin/Clavulanic acid			2	0	0	3	0	1	
Cefazolin		R	R	R	R	R	R	R	
Ceftriaxone	83	74	77	68	62	71	74	76	
Ceftazidime	83	74	79	79	71	74	83	79	R
Piperacillin/Tazobactam	83	76	79	71	71	74	80	80	
Ertapenem	96	100	87	89	81	76	94	91	
Meropenem	100	100	100	100	100	100	100	98	
Gentamicin	100	96	100	97	100	100	100	98	
Tobramycin	100	96	100	97	100	100	100	98	
Amikacin	100	100	100	100					
Nitrofurantoin	50	52	43	42	32	47	49	83	
Trimethoprim/Sulfamethoxazole	96	96	96	97	91	91	97	93	
Ciprofloxacin	96	100	96	97	97	97	97	98	
<i>Klebsiella aerogenes</i>							20	23	# isolates
Ampicillin							R	R	
Amoxicillin/Clavulanic acid							0	1	
Cefazolin							R	R	
Ceftriaxone							85	61	
Ceftazidime							85	57	
Piperacillin/Tazobactam							85	67	
Ertapenem							100	100	
Meropenem							100	100	
Gentamicin							100	100	
Tobramycin							100	100	
Nitrofurantoin							25	80	
Trimethoprim/Sulfamethoxazole							95	100	
Ciprofloxacin							90	95	
<i>Proteus mirabilis</i>	46	68	79	90	80	69	111	129	# isolates
Ampicillin	83	91	80	82	81	72	75	76	
Amoxicillin/Clavulanic acid			99	98	95	94	89	96	
Cefazolin		96	91	98	94	94	92	91	
Ceftriaxone	96	97	95	100	98	99	96	95	
Ceftazidime	96	97	95	98	98	97	95	96	
Piperacillin/Tazobactam	98	100	99	100	98	100	99	100	
Ertapenem	100	100	100	100	100	100	100	100	
Meropenem	100	100	100	100	100	99	100	98	
Gentamicin	89	94	90	93	89	96	93	95	
Tobramycin	89	96	94	96	93	99	95	97	
Amikacin	100	100	100	100					
Nitrofurantoin		R	R	R	R	R	0	0	
Trimethoprim/Sulfamethoxazole	76	91	90	86	90	80	86	82	
Ciprofloxacin	96	96	95	88	80	87	87	82	

Year	2016	2017	2018	2019	2020	2021	2022	2023	# isolates
<i>Pseudomonas aeruginosa</i>	48	77	65	88	84	77	103	109	
Ampicillin									
Amoxicillin/Clavulanic acid			R	R	R	R	R	R	
Cefazolin									
Ceftriaxone									
Ceftazidime	85	86	89	92	93	97	93	96	R
Piperacillin/Tazobactam	90	92	92	94	92	99	94	100	
Ertapenem									
Meropenem	92	91	92	88	94	99	94	99	
Gentamicin	94	94	97	98	98	100	97	100	
Tobramycin	98	100	98	99	99	100	99	100	
Amikacin	98	100	97	98					
Nitrofurantoin									
Trimethoprim/Sulfamethoxazole									
Ciprofloxacin	94	96	89	94	94	90	87	96	

Year 2016 2017 2018 2019 2020 2021 2022 2023

MSH Urine Culture Specimens: % Susceptibility

Gram Positive Organisms

Organism	2016	2017	2018	2019	2020	2021	2022	2023	# isolates
<i>Staphylococcus Aureus</i>	11	21	30	29	31	34	29	38	
Ampicillin									
Amoxicillin/Clavulanic Acid			100	96	100	100	93	100	
Cefazolin	100	65	83	93	84	85	93	100	
Cloxacillin	100	62	83	93	84	85	93	100	
Trimethoprim/Sulfamethoxazole	100	100	100	100	97	100	100	100	
Ciprofloxacin	100	62	80	83	71	74	93	86	
Nitrofurantoin	100	100	100	97	97	100	100	100	
Tetracyclin	91	86	93	100	97	97	100	95	
Rifampin	100	100	100	100	100	100	100	100	
Vancomycin	100	100	100	100	100	100	100	100	
<i>Enterococcus Species</i>	144	221	246	222	264	255	265	335	
Ampicillin	88	86	88	87	88	90	92	91	
Amoxicillin/Clavulanic Acid								100	
Cefazolin									
Cloxacillin									
Trimethoprim/Sulfamethoxazole									
Ciprofloxacin	72	72	73	75	80	78	82	86	
Nitrofurantoin	90	90	87	86	86	89	91	93	
Tetracyclin	26	29	26	31	27	21	24	28	
Rifampin									
Vancomycin	97	100	99	100	100	100	100	100	
<i>Enterococcus faecalis</i>			5	10	10	6	9		
Ampicillin			100	100	100	100	100		
Amoxicillin/Clavulanic Acid									
Cefazolin									
Cloxacillin									
Trimethoprim/Sulfamethoxazole									
Ciprofloxacin			60	80	90	67	100		
Nitrofurantoin			100	100	100	100	100		
Tetracyclin			20	20	50	33	22		
Rifampin									
Vancomycin			100	100	100	100	100		
<i>Enterococcus faecium</i>			4	3	5	0	2		
Ampicillin			0	0	0	0	0		
Amoxicillin/Clavulanic Acid									
Cefazolin									
Cloxacillin									
Trimethoprim/Sulfamethoxazole									
Ciprofloxacin			0	0	0	0	0		
Nitrofurantoin			0	0	40	0	0		
Tetracyclin			50	67	0	0	0		
Rifampin									
Vancomycin			100	100	100	0	100		

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Year 2016 2017 2018 2019 2020 2021 2022 2023

All locations *S. pneumoniae* Specimens: % Susceptibility

Gram Positive Organisms

	2016	2017	2018	2019	2020	2021	2022	2023	# isolates
Blood culture and spinal fluid specimens	33	38	34	41	8	17	39	51	# isolates
Penicillin V (oral)								100	
Penicillin G (parenteral)								100	
Ceftriaxone								100	
Levofloxacin	100	100	100	100	100	100	97	100	
Meropenem	100	94	94	95	100	94	98	98	R
Vancomycin	100	100	100	100	100	100	100	100	
Trimethoprim/Sulfamethoxazole								82	
Erythromycin								71	
Meningeal interpretation	33	42	38	41	8	18	39	51	# isolates
Penicillin V (oral)									
Penicillin G (parenteral)	85	90	89	90	88	78	79	86	
Ceftriaxone	97	95	95	98	100	94	89	98	
Levofloxacin									
Meropenem									
Vancomycin									
Trimethoprim/Sulfamethoxazole									
Erythromycin									
Non-meningeal interpretation	33	42	38	41	8	18	39	51	# isolates
Penicillin V (oral)									
Penicillin G (parenteral)	100	100	97	100	100	94	97	100	
Ceftriaxone	100	100	100	100	100	94	97	100	
Levofloxacin									
Meropenem									
Vancomycin									
Trimethoprim/Sulfamethoxazole									
Erythromycin									
All specimens except blood cultures and spinal fluid specimens	29	40	30	30	24	14	15	26	# isolates
Penicillin V (oral)	79	72	90	83	75	57	87	83	
Penicillin G (parenteral)	100	91	100	100	100	83	100	100	
Ceftriaxone	100	92	100	100	100	86	100	100	
Levofloxacin	97	97	97	100	100	100	100	100	
Meropenem								83	
Vancomycin								100	
Trimethoprim/Sulfamethoxazole	90	88	86	80	79	79	93	88	
Erythromycin	66	60	76	57	50	64	79	77	

90% or greater susceptible
50-89% susceptible
less than 50% susceptible
antibiotic not tested
less than 30 organisms reported
Intrinsic/Acquired Resistance
C. freundii is intrinsically resistant to Amoxicillin/Clavulanic Acid
E. aerogens and E. cloacae are intrinsically resistant to Amoxicillin/Clavulanic Acid
Results for this drug not available - as per CLSI these drugs lack efficacy and are not suitable for AST or treatment of infection

E
tion in interpretation if fewer than 30
re reported for a given species.
ended that at least 30 organism isolates
for a given reporting period in order
valid statistical comparisons.

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