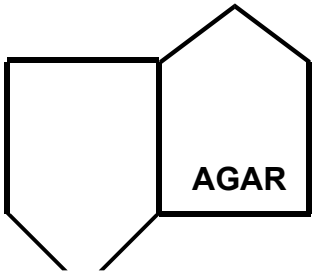

DRAFT

The Australian Group on Antimicrobial Resistance

Escherichia coli & Klebsiella spp.

Enterobacter spp.

Antimicrobial Minimum Inhibitory Concentrations

2000 Survey - Preliminary Results

Drug	Minimum Inhibitory Concentration (mg/L)																Total	%S	%IR
	0.004	0.008	0.016	0.03	0.06	0.125	0.25	0.5	1	2	4	8	16	32	64	128			
ampicillin										3	1	4	6	21	156		191		
										(1.6)	(0.5)	(2.1)	(3.1)	(11.0)	(81.7)			4.2%	95.8%
piperacillin								2	5	58	46	11	5	10	17	37	191		
								(1.0)	(2.6)	(30.4)	(24.1)	(5.8)	(2.6)	(5.2)	(8.9)	(19.4)		66.5%	33.5%
co-amoxyclav									4	3	3	8	141	23	9		191		
									(2.1)	(1.6)	(1.6)	(4.2)	(73.8)	(12.0)	(4.7)			9.4%	90.6%
pip/tazobactam								3	58	49	19	11	6	23	16	6	191		
								(1.6)	(30.4)	(25.7)	(9.9)	(5.8)	(3.1)	(12.0)	(8.4)	(3.1)		76.4%	23.6%
aztreonam												156	35				191		
												(81.7)	(18.3)					81.7%	18.3%
cephalothin												6	2	183			191		
												(3.1)	(1.0)	(95.8)				3.1%	96.9%
cefazolin									5	2	2		2	180			191		
									(2.6)	(1.0)	(1.0)		(1.0)	(94.2)				4.7%	95.3%
cefoxitin												9	182				191		
												(4.7)	(95.3)					4.7%	95.3%
ceftriaxone			1	14	62	30	10	1	7	5	4	8	49				191		
			(0.5)	(7.3)	(32.5)	(15.7)	(5.2)	(0.5)	(3.7)	(2.6)	(2.1)	(4.2)	(25.7)					74.3%	25.7%
ceftazidime				1	13	51	38	14	10	4	2	7	51				191		
				(0.5)	(6.8)	(26.7)	(19.9)	(7.3)	(5.2)	(2.1)	(1.0)	(3.7)	(26.7)					73.3%	26.7%
cefepime								162	14	6	6		3				191		
								(84.8)	(7.3)	(3.1)	(3.1)		(1.6)					98.4%	1.6%
gentamicin							2	60	103	16	2		8				191		
							(1.0)	(31.4)	(53.9)	(8.4)	(1.0)		(4.2)					95.8%	4.2%
trimethoprim							7	74	76	8	5	5	16				191		
							(3.7)	(38.7)	(39.8)	(4.2)	(2.6)	(2.6)	(8.4)					91.6%	8.4%
ciprofloxacin		2	35	93	31	10	7	8	2	2	1						191		
		(1.0)	(18.3)	(48.7)	(16.2)	(5.2)	(3.7)	(4.2)	(1.0)	(1.0)	(0.5)							98.4%	1.6%
meropenem						181	7		1	1		1					191		
						(94.8)	(3.7)		(0.5)	(0.5)		(0.5)						99.5%	0.5%

Drug	Minimum Inhibitory Concentration (mg/L)																Total	%S	%IR
	0.004	0.008	0.016	0.03	0.06	0.125	0.25	0.5	1	2	4	8	16	32	64	128			
ampicillin								1		3	3	5	27	74	413		526		
								(0.2)		(0.6)	(0.6)	(1.0)	(5.1)	(14.1)	(78.5)			2.3%	97.7%
piperacillin								4	26	139	120	25	17	14	18	163	526		
								(0.8)	(4.9)	(26.4)	(22.8)	(4.8)	(3.2)	(2.7)	(3.4)	(31.0)		62.9%	37.1%
co-amoxyclav								1	6	3	5	17	229	206	59		526		
								(0.2)	(1.1)	(0.6)	(1.0)	(3.2)	(43.5)	(39.2)	(11.2)			6.1%	93.9%
pip/tazobactam								16	137	134	66	25	21	28	30	69	526		
								(3.0)	(26.0)	(25.5)	(12.5)	(4.8)	(4.0)	(5.3)	(5.7)	(13.1)		75.9%	24.1%
aztreonam												357	169				526		
												(67.9)	(32.1)					67.9%	32.1%
cephalothin												6	7	513			526		
												(1.1)	(1.3)	(97.5)				1.1%	98.9%
cefazolin									4	3	2		17	500			526		
									(0.8)	(0.6)	(0.4)		(3.2)	(95.1)				1.7%	98.3%
cefoxitin												17	509				526		
												(3.2)	(96.8)					3.2%	96.8%
ceftriaxone		2	4	10	20	83	94	51	28	17	15	24	178				526		
		(0.4)	(0.8)	(1.9)	(3.8)	(15.8)	(17.9)	(9.7)	(5.3)	(3.2)	(2.9)	(4.6)	(33.8)					66.2%	33.8%
ceftazidime				2	9	60	138	76	29	17	9	16	170				526		
				(0.4)	(1.7)	(11.4)	(26.2)	(14.4)	(5.5)	(3.2)	(1.7)	(3.0)	(32.3)					67.7%	32.3%
cefepime								389	30	18	18	22	49				526		
								(74.0)	(5.7)	(3.4)	(3.4)	(4.2)	(9.3)					90.7%	9.3%
gentamicin							2	257	188	25	4	8	42				526		
							(0.4)	(48.9)	(35.7)	(4.8)	(0.8)	(1.5)	(8.0)					90.5%	9.5%
trimethoprim							14	144	230	50	18	7	63				526		
							(2.7)	(27.4)	(43.7)	(9.5)	(3.4)	(1.3)	(12.0)					88.0%	12.0%
ciprofloxacin	4	19	115	204	90	31	18	10	10	12	13						526		
	(0.8)	(3.6)	(21.9)	(38.8)	(17.1)	(5.9)	(3.4)	(1.9)	(1.9)	(2.3)	(2.5)							95.2%	4.8%
meropenem						470	41	12	1	1		1					526		
						(89.4)	(7.8)	(2.3)	(0.2)	(0.2)		(0.2)						99.8%	0.2%

Drug	Minimum Inhibitory Concentration (mg/L)																Total	%S	%IR
	0.004	0.008	0.016	0.03	0.06	0.125	0.25	0.5	1	2	4	8	16	32	64	128			
ampicillin								3 (0.8)	5 (1.2)	86 (21.5)	92 (23.0)	5 (1.2)	5 (1.2)	11 (2.8)	193 (48.2)		400	47.8%	52.2%
piperacillin								5 (1.2)	45 (11.2)	110 (27.5)	37 (9.2)	2 (0.5)	1 (0.2)	5 (1.2)	11 (2.8)	184 (46.0)	400	50.0%	50.0%
co-amoxyclav								1 (0.2)	20 (5.0)	146 (36.5)	95 (23.8)	106 (26.5)	30 (7.5)	2 (0.5)			400	92.0%	8.0%
pip/tazobactam								54 (13.5)	212 (53.0)	83 (20.8)	15 (3.8)	9 (2.2)	6 (1.5)	7 (1.8)	7 (1.8)	7 (1.8)	400	94.8%	5.2%
aztreonam												394 (98.5)	6 (1.5)				400	98.5%	1.5%
cephalothin												181 (45.2)	119 (29.8)	100 (25.0)			400	45.2%	54.8%
cefazolin							2 (0.5)	20 (5.0)	166 (41.5)	86 (21.5)	55 (13.8)	24 (6.0)	10 (2.5)	37 (9.2)			400	88.2%	11.8%
cefoxitin												393 (98.2)	7 (1.8)				400	98.2%	1.8%
ceftriaxone		3 (0.8)	12 (3.0)	205 (51.2)	155 (38.8)	15 (3.8)	2 (0.5)	1 (0.2)		1 (0.2)	1 (0.2)		5 (1.2)				400	98.8%	1.2%
ceftazidime				3 (0.8)	75 (18.8)	206 (51.5)	98 (24.5)	9 (2.2)	1 (0.2)	2 (0.5)		1 (0.2)	5 (1.2)				400	98.8%	1.2%
cefepime								391 (97.8)	1 (0.2)	3 (0.8)	1 (0.2)		4 (1.0)				400	99.0%	1.0%
gentamicin							1 (0.2)	7 (1.8)	199 (49.8)	160 (40.0)	21 (5.2)	6 (1.5)	6 (1.5)				400	97.0%	3.0%
trimethoprim							112 (28.0)	155 (38.8)	37 (9.2)	2 (0.5)	9 (2.2)	1 (0.2)	84 (21.0)				400	79.0%	21.0%
ciprofloxacin	2 (0.5)	32 (8.0)	243 (60.9)	95 (23.8)	10 (2.5)	2 (0.5)	4 (1.0)	4 (1.0)	2 (0.5)		5 (1.3)						399	98.7%	1.3%
meropenem						400 (100)											400	100%	

Drug	Minimum Inhibitory Concentration (mg/L)																Total	%S	%IR
	0.004	0.008	0.016	0.03	0.06	0.125	0.25	0.5	1	2	4	8	16	32	64	128			
ampicillin										1	2	2	4	9	89		107		
										(0.9)	(1.9)	(1.9)	(3.7)	(8.4)	(83.2)			4.7%	95.3%
piperacillin										1	6	2	21	23	19	35	107		
										(0.9)	(5.6)	(1.9)	(19.6)	(21.5)	(17.8)	(32.7)		28.0%	72.0%
co-amoxyclav									30	56	6	2	13				107		
									(28.0)	(52.3)	(5.6)	(1.9)	(12.1)					87.9%	12.1%
pip/tazobactam								5	46	37	5	1			2	11	107		
								(4.7)	(43.0)	(34.6)	(4.7)	(0.9)			(1.9)	(10.3)		87.9%	12.1%
aztreonam												91	16				107		
												(85.0)	(15.0)					85.0%	15.0%
cephalothin												61	17	29			107		
												(57.0)	(15.9)	(27.1)				57.0%	43.0%
cefazolin									20	6	13	11	19	38			107		
									(18.7)	(5.6)	(12.1)	(10.3)	(17.8)	(35.5)				46.7%	53.3%
cefoxitin												105	2				107		
												(98.1)	(1.9)					98.1%	1.9%
ceftriaxone			2	30	32	21	7		1	1			13				107		
			(1.9)	(28.0)	(29.9)	(19.6)	(6.5)		(0.9)	(0.9)			(12.1)					87.9%	12.1%
ceftazidime				3	25	46	21	10	1				1				107		
				(2.8)	(23.4)	(43.0)	(19.6)	(9.3)	(0.9)				(0.9)					99.1%	0.9%
cefepime								97	1	1	1	4	3				107		
								(90.7)	(0.9)	(0.9)	(0.9)	(3.7)	(2.8)					97.2%	2.8%
gentamicin							1	30	65	9			2				107		
							(0.9)	(28.0)	(60.7)	(8.4)			(1.9)					98.1%	1.9%
trimethoprim							14	67	15	4	1	1	5				107		
							(13.1)	(62.6)	(14.0)	(3.7)	(0.9)	(0.9)	(4.7)					95.3%	4.7%
ciprofloxacin		2	38	54	9	3					1						107		
		(1.9)	(35.5)	(50.5)	(8.4)	(2.8)					(0.9)							99.1%	0.9%
meropenem						106		1									107		
						(99.1)		(0.9)										100%	

| Antibiotic Profile | | | | | | | | | | | | | | | | | | Laboratory | | | | | | | | | | | | | | | | | |

Antibiogram: *Enterobacter aerogenes* (n=191)

Antibiotic Profile	AUS	Laboratory															
AmpPipAmcPtzAztCepCzlCftCtrCazCpmGenTmpCipMer		101	102	201	206	207	301	401	402	403	404	601	603	604	701	703	702
AmpPipAmc CepCzlCfxCtr Tmp	1																1
AmpPipAmc CepCzlCfxCtrCaz	3												2		1		
AmpPipAmc AztCepCzlCfx	1										1						
AmpPipAmc AztCepCzlCfxCtrCaz	1				1												
AmpPipAmcPtz CepCzlCfx	1					1											
AmpPipAmcPtz CepCzlCfx Caz	1				1												
AmpPipAmcPtz CepCzlCfxCtrCaz	11		2	1	1	1	1		1	1			1		1		1
AmpPipAmcPtz CepCzlCfxCtrCaz Tmp	1		1														
AmpPipAmcPtz CepCzlCfxCtrCazCpm	1												1				
AmpPipAmcPtzAztCepCzlCfx Caz	1														1		
AmpPipAmcPtzAztCepCzlCfxCtrCaz	21	1	2	1	1	3	1	3		1	2	1	2	1		2	
AmpPipAmcPtzAztCepCzlCfxCtrCaz Cip	1												1				
AmpPipAmcPtzAztCepCzlCfxCtrCaz Tmp	1											1					
AmpPipAmcPtzAztCepCzlCfxCtrCaz GenTmp	1		1														
AmpPipAmcPtzAztCepCzlCfxCtrCazCpm	1										1						
AmpPipAmcPtzAztCepCzlCfxCtrCazCpmGenTmp Mer	1							1									

| Antibiotic Profile | | | | | | | | | | | | | | | | | | | | Laboratory | | | | | | | | | | | | | | | | | | |

Antibiogram: *Enterobacter cloacae* (n=526)

Antibiotic Profile		Laboratory																
AmpPipAmcPtzAztCepCzlCftCtrCazCpmGenTmpCipMer	AUS	101	102	201	206	207	301	401	402	403	404	601	603	604	701	703	702
AmpPip CepCzlCfx Tmp	1		1														
AmpPip CepCzlCfx Caz	1																1
AmpPip AztCepCzl CtrCaz GenTmp	2			2													
AmpPip AztCepCzlCfxCtrCaz	1																1
AmpPip PtzAztCepCzl CtrCaz Gen	1			1													
AmpPip PtzAztCepCzl CtrCaz GenTmp	1			1													
AmpPipAmc CepCzlCfx	5			1		1			1							1	1
AmpPipAmc CepCzlCfx Tmp	5		2											2			1
AmpPipAmc CepCzlCfx Gen	1	1															
AmpPipAmc CepCzlCfx GenTmp	2			1									1				
AmpPipAmc CepCzlCfx Caz	2													1			1
AmpPipAmc CepCzlCfxCtr	3						1				1			1			
AmpPipAmc CepCzlCfxCtr Gen	1										1						
AmpPipAmc CepCzlCfxCtrCaz	8			1							1	1	3		1		1
AmpPipAmc AztCepCzlCfxCtr CpmGenTmp	1		1														
AmpPipAmc AztCepCzlCfxCtrCaz	11			2		1				1	1	2	3		1		
AmpPipAmc AztCepCzlCfxCtrCaz Tmp	2	1															1
AmpPipAmc AztCepCzlCfxCtrCaz GenTmp	7	2		1				1				1	2				
AmpPipAmc AztCepCzlCfxCtrCaz GenTmpCip	4	2		1								1					
AmpPipAmc AztCepCzlCfxCtrCazCpmGen	1					1											
AmpPipAmc AztCepCzlCfxCtrCazCpmGenTmp	3					3											
AmpPipAmc AztCepCzlCfxCtrCazCpmGenTmpCip	3				1	2											
AmpPipAmcPtz CepCzlCfxCtr	1											1					
AmpPipAmcPtz CepCzlCfxCtrCaz	9		1			1	1					1	2	1	2		
AmpPipAmcPtz CepCzlCfxCtrCaz Gen	1	1															
AmpPipAmcPtz CepCzlCfxCtrCazCpm	2														1	1	

Antibiotic Profile		Laboratory																
AmpPipAmcPtzAztCepCzlCftCtrCazCpmGenTmpCipMer	AUS	101	102	201	206	207	301	401	402	403	404	601	603	604	701	703	702
AmpPipAmcPtzAztCepCzl CtrCaz	1									1							
AmpPipAmcPtzAztCepCzlCfx Caz	3			1				1							1		
AmpPipAmcPtzAztCepCzlCfx Caz Gen Cip	1			1													
AmpPipAmcPtzAztCepCzlCfx CazCpm	2														2		
AmpPipAmcPtzAztCepCzlCfxCtr	3													1	1		1
AmpPipAmcPtzAztCepCzlCfxCtr Cpm	1				1												
AmpPipAmcPtzAztCepCzlCfxCtr CpmGen	1			1													
AmpPipAmcPtzAztCepCzlCfxCtrCaz	49	1	6		3		4	4		5	3	11	2	6	3		1
AmpPipAmcPtzAztCepCzlCfxCtrCaz Mer	1										1						
AmpPipAmcPtzAztCepCzlCfxCtrCaz Cip	1											1					
AmpPipAmcPtzAztCepCzlCfxCtrCaz Tmp	3	1		1								1					
AmpPipAmcPtzAztCepCzlCfxCtrCaz GenTmp	3			1	1			1									
AmpPipAmcPtzAztCepCzlCfxCtrCaz GenTmpCip	8			3	2			1								2	
AmpPipAmcPtzAztCepCzlCfxCtrCazCpm	24				1			1	1	1	6	2	2	1	5	3	1
AmpPipAmcPtzAztCepCzlCfxCtrCazCpm Tmp	2									1				1			
AmpPipAmcPtzAztCepCzlCfxCtrCazCpmGen	1										1						
AmpPipAmcPtzAztCepCzlCfxCtrCazCpmGen Cip	1											1					
AmpPipAmcPtzAztCepCzlCfxCtrCazCpmGenTmp	5	1	1	1		1								1			
AmpPipAmcPtzAztCepCzlCfxCtrCazCpmGenTmpCip	2			2													

Antibiotic Profile																Laboratory											
Amp	Pip	Amc	Ptz	Azt	Cep	Czl	Cft	Ctr	Caz	Cpm	Gen	Tmp	Cip	Mer	AUS	101	102	201	206	207	301	401	402	403	404	601	603	604	701	703	702
															126	11	10	7	7	5	13	11	5	10	6	9	2	8	4	8	10
														-	1								1								
												Tmp			8	1	1			2			1			1			1	1	
					Cep										53		1	4	4	1	2	1	1	4	8	10	1	6	4	5	1
					Cep							Tmp			2	1				1											
					Cep				Caz						1					1											
Amp															3	1	1		1												
Amp					Cep										1										1						
Amp					Cep							Tmp			2								1				1				
Amp		Amc			CepCzl										1								1								
Amp		Amc			CepCzl							Tmp			1	1															
Amp		Amc			CepCzl	Cfx									1	1															
AmpPip															20	2	1			3	3	1	2	2	1		3	1			1
AmpPip													Cip		1			1													
AmpPip												Tmp			15		1	2	2	3	1	1	1		1					1	2
AmpPip											Gen				1					1											
AmpPip					Cep										70	4	2	3	5	6	5	4	4	4	5	2	9	6	2	6	3
AmpPip					Cep							Tmp			33	2	2	3	5	5		2	3	2	3				1	3	2
AmpPip					Cep						Gen				2		1					1									
AmpPip					Cep						GenTmp				1													1			
AmpPip					Cep	Cfx									1						1										
AmpPip					Cep	Cfx					GenTmpCip				1								1								
AmpPip					CepCzl										15		2	1						1		2	6	1	1		1
AmpPip					CepCzl							Tmp			1											1					
AmpPip					CepCzl							TmpCip			1																1
AmpPip					CepCzl			Ctr			GenTmp				1			1													

Antibiotic Profile		Laboratory																
AmpPipAmcPtzAztCepCzlCftCtrCazCpmGenTmpCipMer	AUS	101	102	201	206	207	301	401	402	403	404	601	603	604	701	703	702
AmpPip Azt	1												1				
AmpPip AztCepCzl	1												1				
AmpPip Ptz Cep	1														1		
AmpPip Ptz Cep Tmp	2	1			1												
AmpPip PtzAztCepCzl CtrCazCpmGenTmp	1							1									
AmpPip PtzAztCepCzlCfxCtrCazCpm Tmp	1									1							
AmpPip PtzAztCepCzlCfxCtrCazCpmGen Cip	1																1
AmpPipAmc	2		1							1							
AmpPipAmc Tmp	2			1			1										
AmpPipAmc Czl	1					1											
AmpPipAmc Cep GenTmp	1													1			
AmpPipAmc CepCzl	3						1							1	1		
AmpPipAmc CepCzl Tmp	3							1							1		1
AmpPipAmc CepCzl GenTmp	1											1					
AmpPipAmc CepCzlCfx	1								1								
AmpPipAmcPtz Cep Tmp	1							1									
AmpPipAmcPtz Cep Cfx	1					1											
AmpPipAmcPtz CepCzl	7		2	1		1							1				2
AmpPipAmcPtz CepCzl Tmp	4			1					1	1						1	
AmpPipAmcPtz CepCzl GenTmpCip	1														1		
AmpPipAmcPtzAztCepCzl CtrCazCpmGenTmp	1							1									

Antibiotic Profile		Laboratory																
AmpPipAmcPtzAztCepCzlCftCtrCazCpmGenTmpCipMer	AUS	101	102	201	206	207	301	401	402	403	404	601	603	604	701	703	702
	5					2							1			2	
Amp	16	2		1	1	1	2	2	4		2	1					
Amp Czl	4							1	1		1		1				
Amp CepCzl	5	1	1					1						1		1	
AmpPip	24			1	1	7	4	1	1	1	1	1	1	3	1	1	
AmpPip Tmp	3				1	1	1										
AmpPip Cfx	1				1												
AmpPip Czl	8						1		1	1			2	2		1	
AmpPip Cep	1										1						
AmpPip CepCzl	23			1	2	2	2	3		1	2	1		6	1	2	
AmpPip CepCzlCfx	1			1													
AmpPip AztCepCzl	2												2				
AmpPip AztCepCzl CtrCaz GenTmp	1							1									
AmpPipAmcPtzAztCepCzl	1										1						
AmpPipAmcPtzAztCepCzl Ctr	8		1				1	1		1	1	3					
AmpPipAmcPtzAztCepCzl Ctr GenTmpCip	1											1					
AmpPipAmcPtzAztCepCzl Ctr Cpm	3				1	1									1		

| Antibiotic Profile | | | | | | | | | | | | | | | Laboratory | | | | | | | | | | | | | | |

Antibiotic Profile		Laboratory																
AmpPipAmcPtzAztCepCzlCftCtrCazCpmGenTmpCipMer	AUS	101	102	201	206	207	301	401	402	403	404	601	603	604	701	703	702
AmpPip CepCzl GenTmp	1										1						
AmpPip CepCzl Ctr Tmp	1									1							
AmpPip CepCzl Ctr GenTmp	1					1											
AmpPip AztCepCzl CtrCaz Tmp	1							1									
AmpPip AztCepCzl CtrCazCpm Tmp	1									1							
AmpPip AztCepCzlCfxCtrCaz TmpCip	1			1													
AmpPip Ptz Cep	1																1
AmpPip Ptz CepCzl	1					1											
AmpPip Ptz CepCzlCfxCtr Cip	1							1									
AmpPip PtzAztCepCzlCfxCtrCaz Tmp	1										1						
AmpPip PtzAztCepCzlCfxCtrCaz GenTmp	1										1						
AmpPip PtzAztCepCzlCfxCtrCazCpm TmpCip	1			1													
AmpPip PtzAztCepCzlCfxCtrCazCpmGenTmpCip	1			1													
AmpPipAmc	1									1							
AmpPipAmcPtz	1		1														
AmpPipAmcPtz Tmp	1												1				
AmpPipAmcPtz CepCzl Tmp	1															1	
AmpPipAmcPtz CepCzlCfx Tmp	1																1
AmpPipAmcPtzAztCepCzl Ctr	1									1							
AmpPipAmcPtzAztCepCzl Ctr Cpm TmpCip	1		1														
AmpPipAmcPtzAztCepCzlCfxCtrCazCpm Cip	1						1										
AmpPipAmcPtzAztCepCzlCfxCtrCazCpmGenTmpCip	1			1													