

# Antibiograms of Carbapenemase Producing Organisms - September, 2017

Table 1: Aggregate antibiogram of carbapenemase producing organism isolates by number and percentage susceptible to each antimicrobial, received by MDU PHL 01/01/2012 - 25/09/2017

CPO gene(s)	Organism	N	Number and proportion (%) of isolates susceptible													
			Meropenem	Ceftiaxone	Ceftazidime	Cefepime	Ciprofloxacin	Tobramycin	Gentamicin	Amikacin	Cotrimoxazole	Nitrofurantoin	Colistin <sup>†</sup>	Ceftazidime/ Avibactam <sup>†</sup>	Piperacillin/ Tazobactam <sup>†</sup>	
IMP-4	<i>P. aeruginosa</i>	11	0 (0%)		0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	4 (36%)	6 (55%)					
	<i>C. freundii</i>	9	0 (0%)	0 (0%)	0 (0%)	5 (56%)	7 (78%)	0 (0%)	0 (0%)	9 (100%)	6 (67%)					
	<i>E. cloacae</i> complex	41	0 (0%)	0 (0%)	0 (0%)	20 (49%)	31 (76%)	0 (0%)	3 (7%)	41 (100%)	11 (27%)	10/18 (56%)	17/17 (100%)	0/17 (0%)	4/17 (24%)	
	<i>E. coli</i>	12	0 (0%)	0 (0%)	0 (0%)	10 (83%)	11 (92%)	1 (8%)	2 (17%)	12 (100%)	5 (42%)	10 (83%)				
	<i>K. oxytoca</i>	13	1 (8%)	0 (0%)	0 (0%)	13 (100%)	12 (92%)	0 (0%)	1 (8%)	13 (100%)	10 (77%)					
	<i>K. pneumoniae</i>	28	0 (0%)	0 (0%)	0 (0%)	18 (64%)	24 (86%)	0 (0%)	3 (11%)	28 (100%)	11 (39%)		5/5 (100%)	0/5 (0%)	2/5 (40%)	
	<i>S. marcescens</i>	41	2 (5%)	2 (5%)	1 (2%)	26 (63%)	24 (59%)	2 (5%)	20 (49%)	41 (100%)	37 (90%)	1/8 (13%)	0/6 (0%)	0/6 (0%)	6/6 (100%)	
KPC-2	<i>C. farmeri</i>	9	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (22%)	0 (0%)	0 (0%)	9 (100%)	0 (0%)					
	<i>K. pneumoniae</i>	73	0 (0%)	0 (0%)	0 (0%)	26 (36%)	2 (3%)	3 (4%)	70 (96%)	11 (15%)	20 (27%)		3/6 (50%)	6/6 (100%)	0/6 (0%)	
NDM-1	<i>E. coli</i>	8	0 (0%)	0 (0%)	0 (0%)	1 (13%)	2 (25%)	0 (0%)	1 (13%)	4 (50%)	2 (25%)	7 (88%)				
	<i>K. pneumoniae</i>	14	0 (0%)	0 (0%)	0 (0%)	2 (14%)	1 (7%)	2 (14%)	6 (43%)	9 (64%)	3 (21%)					
NDM-5	<i>E. coli</i>	23	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (4%)	9 (39%)	11 (48%)	16 (70%)	2 (9%)	13 (57%)	7/7 (100%)	0/7 (0%)	0/7 (0%)	
	<i>K. pneumoniae</i>	7	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (29%)	1 (14%)	2 (29%)	3 (43%)	2 (29%)					
NDM-5, OXA-232	<i>K. pneumoniae</i>	9	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)					
NDM-7	<i>E. coli</i>	5	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (20%)	3 (60%)	5 (100%)	0 (0%)	3 (60%)				
OXA-232	<i>K. pneumoniae</i>	12	1 (8%)	2 (17%)	4 (33%)	4 (33%)	1 (8%)	2 (17%)	5 (42%)	6 (50%)	1 (8%)					
OXA-181	<i>E. coli</i>	15	8 (53%)	0 (0%)	0 (0%)	1 (7%)	0 (0%)	3 (20%)	6 (40%)	15 (100%)	4 (27%)	5 (33%)				
	<i>K. pneumoniae</i>	9	3 (33%)	1 (11%)	1 (11%)	5 (56%)	2 (22%)	2 (22%)	5 (56%)	9 (100%)	5 (56%)					
OXA-48	<i>E. coli</i>	14	6 (43%)	4 (29%)	10 (71%)	12 (86%)	6 (43%)	8 (57%)	10 (71%)	14 (100%)	2 (14%)	11 (79%)				
	<i>K. pneumoniae</i>	14	6 (43%)	4 (29%)	5 (36%)	8 (57%)	6 (43%)	5 (36%)	6 (43%)	11 (79%)	3 (21%)					
OXA-23	<i>A. calcoaceticus-baumannii</i> complex	11	0 (0%)		0 (0%)	0 (0%)	0 (0%)	1 (9%)	0 (0%)	5 (45%)	0 (0%)					
OXA-23-like, OXA-51-like	<i>A. calcoaceticus-baumannii</i> complex	27	0 (0%)		2 (7%)	0 (0%)	0 (0%)	8 (30%)	3 (11%)	19 (70%)	9 (33%)					
VIM-2	<i>P. aeruginosa</i>	6	0 (0%)		0 (0%)	0 (0%)	2 (33%)	0 (0%)	2 (33%)	0 (0%)						

Notes: Carbapenemase producing organism isolates identified or submitted to the Microbiological Diagnostic Unit Public Health Laboratory (MDU PHL) between 01/01/2012 and 25/09/2017 with available susceptibility data are included in the analysis above. Antimicrobial susceptibility tested by VITEK 2 (bioMérieux) or broth microdilution (indicated with †). Aggregate antibiograms exclude antimicrobials for an organism and carbapenemase gene combinations where fewer than five valid results were available. Aggregate antibiograms are categorised by carbapenemase gene sub-type(s) and isolates may contain other antimicrobial resistance (AMR) mechanisms not indicated. Carbapenemase genes tested by PCR include blaKPC, blaIMP, blaNDM, blaVIM, blaOXA-23-like, blaOXA-24/40-like, blaOXA-48-like, blaOXA-51-like and blaOXA-58-like. Carbapenemase gene subtypes have been determined by Sanger sequencing or whole genome sequence analysis. CLSI breakpoints have been used for all susceptibility interpretation except piperacillin tazobactam in *Pseudomonas* and *Serratia* species, and colistin and ceftazidime/avibactam in all Enterobacteriaceae, which have been interpreted using EUCAST guidelines<sup>1,2</sup>. MIC data for colistin and meropenem are presented on page 2. Intermediate susceptibility included as non-susceptible in aggregate antibiograms.

<sup>1</sup> CLSI. *Performance Standards for Antimicrobial Susceptibility Testing, Twenty-Eighth Edition*. CLSI document M100. Wayne, PA: Clinical and Laboratory Standards Institute; Jan 2018

<sup>2</sup> The European Committee on Antimicrobial Susceptibility Testing. *Breakpoint Tables for Interpretation of MICs and Zone Diameters*. Version 8.1, May 2018. Available: [http://www.eucast.org/clinical\\_breakpoints/](http://www.eucast.org/clinical_breakpoints/)



# Antibiograms of Carbapenemase Producing Organisms - September, 2017

Figure 1a: Distribution of minimum inhibitory concentrations (MIC) to colistin by broth microdilution, carbapenemase producing organisms isolates received by MDU PHL 01/01/2012 - 25/09/2017

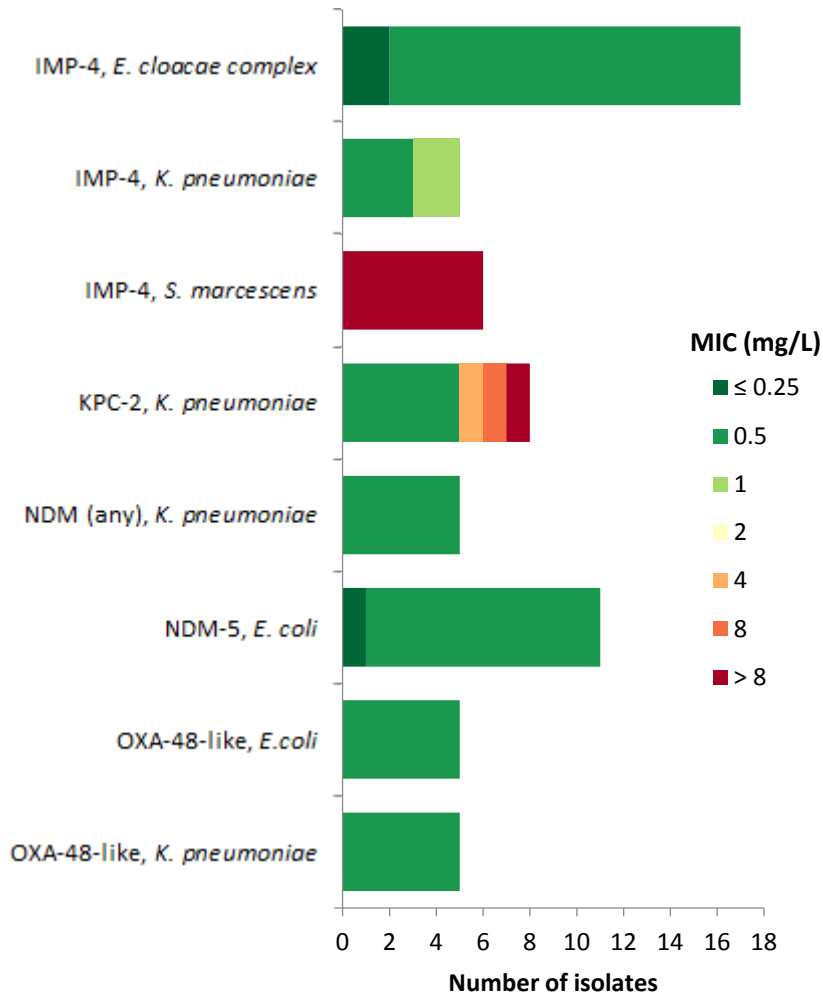
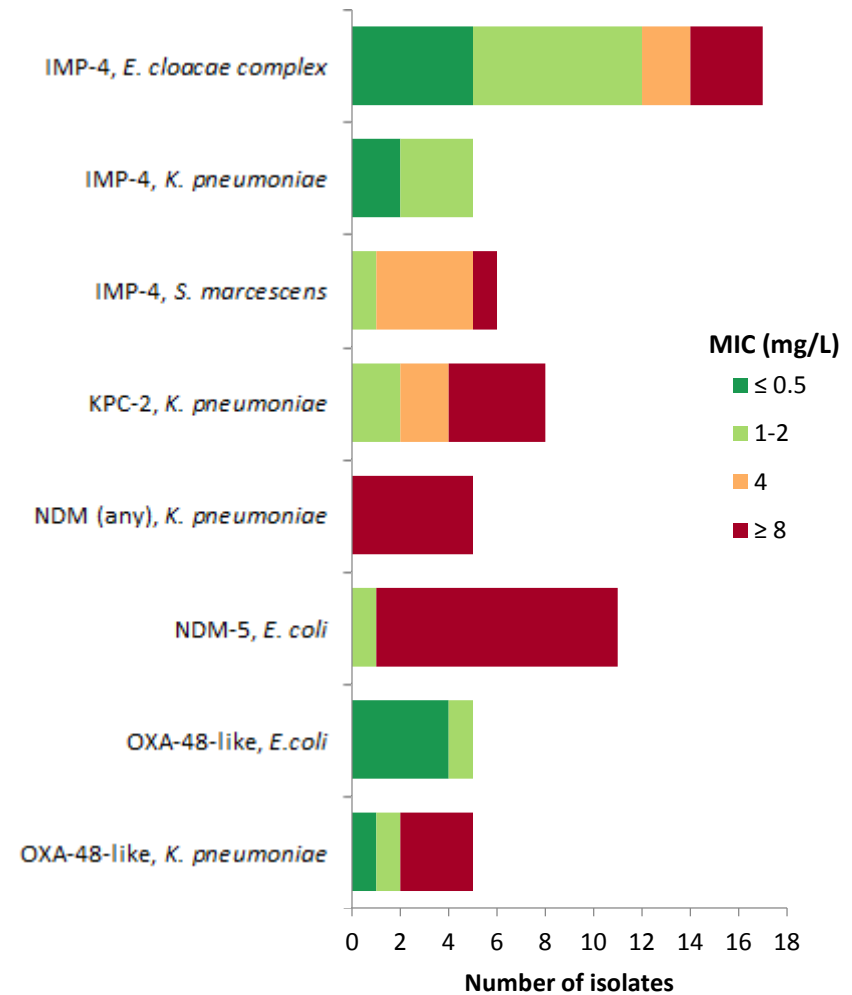


Figure 1b: Distribution of minimum inhibitory concentrations (MIC) to meropenem by broth microdilution, carbapenemase producing organisms isolates received by MDU PHL 01/01/2012 - 25/09/2017



# Antibiograms of Carbapenemase Producing Organisms - September, 2017

Table 2: Aggregate antibiogram of carbapenemase producing organism isolates by number and percentage susceptible to each antimicrobial on VITEK 2, e-test, or broth microdilution as indicated, amongst those reporting travel in the 4 years prior to isolation, by region and country of travel, received by MDU PHL 01/01/2012-25/09/2017

Travel group	Organism	Travel location(s) (12 months prior to identification)*	Overseas hospitalisation	N	Number and proportion (%) of isolates susceptible												Meropenem MIC distribution <sup>†</sup>			
					Ceftriaxone	Ceftazidime	Cefepime	Ciprofloxacin	Tobramycin	Gentamicin	Amikacin	Cotrimoxazole	Nitrofurantoin	Colistin <sup>†</sup>	Ceftazidime/ Avibactam <sup>†</sup>	Piperacillin/ Tazobactam <sup>†</sup>	MIC <4	MIC 4	MIC ≥8	
					Percentage susceptible												0-20%	21-40%	41-60%	61-80%
Southern and Central Asia	<i>E. cloacae</i> complex	India~	Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)
		Sri Lanka~	Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)
	<i>E. coli</i>	India~	Yes	17	0 (0%)	0 (0%)	0 (0%)	0 (0%)	4 (24%)	7 (41%)	9 (53%)	3 (18%)	10 (59%)	7/7 (100%)	2/7 (29%)	0/7 (0%)	3 (18%)	1 (6%)	13 (76%)	
		Pakistan~	Yes	2	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (100%)	2 (100%)	2 (100%)	1 (50%)	2 (100%)	1/1 (100%)	0/1 (0%)	0/1 (0%)	1 (50%)	0 (0%)	1 (50%)	
		Bangladesh~	Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
		Sri Lanka~	Yes	1	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
		India	No	5	0 (0%)	0 (0%)	0 (0%)	0 (0%)	3 (60%)	3 (60%)	4 (80%)	1 (20%)	3 (60%)	2/2 (100%)	0/2 (0%)	0/2 (0%)	2 (40%)	0 (0%)	3 (60%)	
		Pakistan	No	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	1 (100%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
	<i>K. pneumoniae</i>	India~	Yes	7	0 (0%)	2 (29%)	2 (29%)	0 (0%)	0 (0%)	2 (29%)	0 (0%)	0 (0%)	0/3 (0%)	2/2 (100%)	1/2 (50%)	0/2 (0%)	0 (0%)	0 (0%)	7 (100%)	
		Sri Lanka~	Yes	3	0 (0%)	0 (0%)	0 (0%)	1 (33%)	0 (0%)	2 (67%)	3 (100%)	2 (67%)	1/2 (50%)	2/2 (100%)	0/2 (0%)	0/2 (0%)	0 (0%)	0 (0%)	3 (100%)	
Afghanistan~		Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)		
Sri Lanka		No	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)		
<i>P. rettgeri</i>	India~	Yes	1	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)		
South-east Asia	<i>C. freundii</i>	Philippines~	Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
	<i>E. cloacae</i> complex	Philippines~	Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
		Thailand~	Yes	1	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
	<i>E. coli</i>	Vietnam~	Yes	4	0 (0%)	1 (25%)	2 (50%)	0 (0%)	1 (25%)	4 (100%)	4 (100%)	1 (25%)	3 (75%)	3/3 (100%)	2/3 (67%)	0/3 (0%)	4 (100%)	0 (0%)	0 (0%)	
		Cambodia~	Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
		Malaysia~	Yes	1	0 (0%)	0 (0%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	
		Philippines~	Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
		Thailand~	Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
		Vietnam	No	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)	1 (100%)	1 (100%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)
	<i>K. pneumoniae</i>	Vietnam~	Yes	6	0 (0%)	0 (0%)	2 (33%)	1 (17%)	1 (17%)	2 (33%)	5 (83%)	4 (67%)	2/4 (50%)	4/4 (100%)	2/4 (50%)	0/4 (0%)	2 (33%)	0 (0%)	4 (67%)	
Vietnam~, Thailand~		Yes	2	0 (0%)	0 (0%)	1 (50%)	0 (0%)	0 (0%)	2 (100%)	1 (50%)	1 (50%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (100%)		
Thailand~		Yes	2	1 (50%)	1 (50%)	1 (50%)	1 (50%)	1 (50%)	2 (100%)	2 (100%)	2 (100%)	0/1 (0%)	1/1 (100%)	0/1 (0%)	0/1 (0%)	1 (50%)	0 (0%)	1 (50%)		
Singapore~		Yes	1	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)		
Vietnam		No	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)		
Southern and Eastern Europe	<i>E. cloacae</i> complex	Greece~	Yes	1	0 (0%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)		
	<i>E. coli</i>	Greece~	Yes	1	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
		<i>K. pneumoniae</i>	Greece~	Yes	10	0 (0%)	0 (0%)	6 (60%)	0 (0%)	1 (10%)	9 (90%)	5 (50%)	3 (30%)	0 (0%)	0 (0%)	0 (0%)	1 (10%)	0 (0%)	9 (90%)	
		Malta~	Yes	1	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
		Ukraine~	Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	



# Antibiograms of Carbapenemase Producing Organisms - September, 2017

Percentage susceptible 0-20% 21-40% 41-60% 61-80% 81-100%

Travel group	Organism	Travel location(s) (12 months prior to identification)*	Overseas hospital- isation	N	Number and proportion (%) of isolates susceptible													Meropenem MIC distribution <sup>†</sup>		
					Ceftriaxone	Ceftazidime	Cefepime	Ciprofloxacin	Tobramycin	Gentamicin	Amikacin	Cotrimoxazole	Nitrofurantoin	Colistin <sup>‡</sup>	Ceftazidime/ Avibactam <sup>‡</sup>	Piperacillin/ Tazobactam <sup>‡</sup>	MIC <4	MIC 4	MIC ≥8	
North Africa and the Middle East	<i>E. coli</i>	Lebanon~	Yes	4	1 (25%)	3 (75%)	4 (100%)	2 (50%)	4 (100%)	4 (100%)	4 (100%)	1 (25%)	3 (75%)	1/1 (100%)	1/1 (100%)	0/1 (0%)	4 (100%)	0 (0%)	0 (0%)	
		Turkey~	Yes	1	1 (100%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	1 (100%)				1 (100%)	0 (0%)	0 (0%)	
	<i>K. pneumoniae</i>	Iraq~	Yes	1	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
North-east Asia	<i>E. coli</i>	China~	Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)				0 (0%)	0 (0%)	1 (100%)	
		Turkey	No	1	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)						0 (0%)	0 (0%)	1 (100%)
	<i>K. pneumoniae</i>	China~	Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	
Other regions and multiple regions	<i>S. marcescens</i>	Mauritius~	Yes	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)
		<i>E. coli</i>	Europe	No	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	<i>E. coli</i>	India, Singapore, Borneo, Europe	No	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	1 (100%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)
		India, Singapore, Guam	No	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				0 (0%)	0 (0%)	1 (100%)
	<i>E. coli</i>	Jordan, India	No	1	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	1 (100%)	0 (0%)				1 (100%)	0 (0%)	0 (0%)
<i>K. pneumoniae</i>	Thailand, China	No	1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	

\* Where a CPE case has travelled to multiple locations but has been hospitalised in one or more of those locations, only those locations in which the case was hospitalised are listed

† MIC by broth microdilution

‡ MIC by Vitek or broth microdilution

~ Travel location of hospitalisation

Notes: Carbapenemase producing organism isolates identified or submitted to the Microbiological Diagnostic Unit Public Health Laboratory (MDU PHL) between 01/01/2012 and 25/09/2017 with available susceptibility data are included in the analysis above. Antimicrobial susceptibility tested by VITEK 2 (bioMérieux) or broth microdilution (indicated with †). Aggregate antibiograms exclude antimicrobials for an organism and carbapenemase gene combinations where fewer than five valid results were available. Aggregate antibiograms are categorised by carbapenemase gene sub-type(s) and isolates may contain other antimicrobial resistance (AMR) mechanisms not indicated. Carbapenemase genes tested by PCR include blaKPC, blaIMP, blaNDM, blaVIM, blaOXA-23-like, blaOXA-24/40-like, blaOXA-48-like, blaOXA-51-like and blaOXA-58-like. Carbapenemase gene subtypes have been determined by Sanger sequencing or whole genome sequence analysis. CLSI breakpoints have been used for all susceptibility interpretation except piperacillin tazobactam in *Pseudomonas* and *Serratia* species, and colistin and ceftazidime/avibactam in all Enterobacteriaceae, which have been interpreted using EUCAST guidelines<sup>1,2</sup>. MIC data for colistin and meropenem are presented on page 2. Intermediate susceptibility included as non-susceptible in aggregate antibiograms.

