

Table S1. Antimicrobial resistance among Gram-positive organisms in Papua New Guinea.

% Resistance to Antibiotic (No. of Isolates Evaluated)																	
Year	Location	Tissue	PCN	CLX	MET	OXA	AMP	CTX	GEN	CMP	TET	ERY	COT	TMP	CLN	CIP	RIF
<i>Staphylococcus aureus</i>																	
1971–1981 [14]	Port Moresby	Pus	90		0				0								
1978 [15]	Rabaul	Pus, sputum		0 (1)					0 (1)								
1979 [14]	Port Moresby									100 (1)							
1979–1981 [15]	Port Moresby	Pus	98		0				0								
1979–1981 [15]	Port Moresby									26							
1982–1983 [16]	Goroka	Skin					100 (1)										
1982–1983 [16]	Goroka	Skin	98.2 (399)				0.75 (399)										
1982–1986 [17]	Goroka	Multiple [†]	97 (73)		3 (73)				0 (73)	7 (73)	3 (66)	1 (73)	1 (73)				
1984 [18]	Goroka	Skin	92 (25)														
1989 [19]	Goroka	Lung			100 (1)												
2000 [20]	Goroka				11.8 (17)												
2008–2009 [21]	Madang	Blood				75 (4)				0 (3)							
2010 [22]	Madang	Nasal swabs	100 (44)			9.1 (44)					4.6 (44)	2.3 (44)		2.3 (44)	0 (44)		0 (44)
2013 [23]	Kundiawa			90						90						100	
2012–2017 [25]	Kundiawa	Blood, bone, joint aspirates, soft tissue	91.5 (47)		85.1 (47)	89.4 (47)	93.6 (47)	80.9 (47)	8.5 (47)		6.4 (47)	6.4 (47)	4.3 (47)		6.4 (47)		
2014 [24]	PNG	Blood, urine, wounds			43.9 (164)												
<i>Streptococcus pneumoniae</i>																	
1968–1970 [30]	West Sepik		12 (530)														
1969 [28]	West Sepik	Throat swab	100 (1)														
1971–1974 [28]	PNG		14 (292)														
1978 [31]	Port Moresby		33 (57)							0	0	0					
1978–1981 [31]	Goroka	Blood, lung	63 (24)														
1978–1987 [35]	Goroka	Blood, lung	52 (73)														
1980–1982 [36]	Goroka	Nasal swabs	63 (956)														
1980–1984 [33]	Goroka	CSF	22 (67)							0							
1980–1985 [17]	Goroka, Port Moresby	Multiple [†]	56 * (3018)							0 (1047)							
1980–1987 [38]	Goroka	Nasal swabs, invasive isolates	67 (898)														
1982–1983 [16]	Goroka	Skin	60 (5)							0							
1983–1984 [34]	Goroka	Blood	46 (28)							0							

1985–1987 [35]	Goroka	Blood, lung								0 (655)	0 (655)	0 (655)	0 (655)				
1989–1992 [39]	Goroka	Blood, CSF	23 (31)	22 (46)						0		0	74 (61)	65 (32)			
1996–2005 [42]	Goroka	CSF	21.5 (177)		0.8 * (124)					2.3 (176)	4.2 (96)		4 (176)				
1998–2000 [4]	Goroka		100 (1)							0 (1)							
2000 [41]	Goroka									100 (2)							
2006–2009 [41]	Madang	Blood, CSF	13.3 (15)		0 (15)						6.3 (16), 25 * (16)			17.7 (17), 41 * (17)			
2009 [4]	Port Moresby		7 (40)		0 (13)	0 (6)	93.9 (33)	8 (38)		4 (28)	0 (40)		16.7 (6)				
<i>Streptococcus pyogenes</i>																	
1983 [16]	Goroka	Skin	0 (337)														
1984–1986 [17]	Goroka	Multiple †	0							0	0						
<i>Streptococcus agalactiae</i>																	
1982–1983 [16]	Goroka	Skin	0 (2)														
Other β-hemolytic streptococci																	
1984–1986 [17]	Goroka	Multiple †	0 (22)							5 (22)	15 (20)						
<i>Corynebacterium</i> spp.																	
1984–1986 [17]	Goroka	Skin	0 (8)							0 (8)	0 (8)	0 (8)					

PCN = penicillin, CLX = (flu)cloxacillin, MET = methicillin, OXA = oxacillin, AMP = ampicillin/amoxicillin, CTX = ceftriaxone, GEN = gentamicin, KAN = kanamycin, CMP = chloramphenicol, TET = tetracycline, ERY = erythromycin, COT = cotrimoxazole, TMP = trimethoprim–sulfamethoxazole, CLN = clindamycin, CIP = ciprofloxacin, RIF = rifampicin. * = intermediate resistance, † = blood, CSF, urine, skin lesions, stool, joint aspirates, lung aspirates.

Table S2. Antimicrobial resistance among Gram-negative organisms in Papua New Guinea.

% Resistance to Antibiotic (No. of Isolates Evaluated)																	
Year	Location	Tissue	PCN	MET	AMP	CTX	GEN	KAN	STR	CMP	TET	ERY	COT	TMP	CIP	NAL	SPC
<i>Haemophilus influenzae</i>																	
1980–1984 [33]	Goroka	CSF	1.8 (56)		0					0							
1981 [32,50]	Goroka	CSF, nasopharynx	0.7 (293)							0 (2)							
1981–1986 [17]	Goroka	Multiple †	0.3 (1516)		0.3 (1516)												
1983–1984 [34]	Goroka	Multiple †	0 (30)		0 (30)												
1983–1986 [17]	Goroka	Multiple †								0 (839)							
1989–1992 [39]	Goroka	Blood, CSF			13 (24)					0	0		28 (25)	44 (9)			
1996–2005 [42]	Goroka	CSF			28.4 (162)	5 (80)				31.5 (162)			34 (162)				
1998 [51]	Lae, Goroka, Port Moresby									25							
2000 [37]	Lae, Goroka, Port Moresby									21							
2000 [20]	Goroka									22.7							
2000 [4]	Goroka									36.4 (11)							

2006–2009 [41]	Madang	Blood, CSF	93.3 (15)		0 (10)		100 (14)	93.3 (15)		100 (15)
<i>Escherichia coli</i>										
1978 [15]	Rabaul	Sputum	100 (1)	100 (1)		0 (1)		0 (1)		
1984–1986 [17]	Goroka	Multiple †			46 (37)	3 (37)	8 (13)	32 (27)	11 (27)	8 (37)
1997–1998 [54]	Goroka					38 (8)		88 (8)		
2012 [24]	PNG	Blood, stool, urine, pus			24.1 † (174)					13.3 § (526)
<i>Klebsiella spp.</i>										
1978 [15]	Rabaul	Sputum	100 (1)	100 (1)		0 (1)		0 (1)		
1992 [56]	Port Mo- resby	Blood	100 (1)		100 (1)		100 (1)	0 (1)		100 (1)
1992 [56]	Port Mo- resby	Blood						54 (28)	29 (28)	61 (28)
1997–1998 [54]	Goroka	Blood, CSF, lung				76 (14)		100 (14)		
2007–2008 [57]	Port Mo- resby	Blood			54 † (57)					
2008–2009 [21]	Madang	Blood			100 (2)	50 (2)		100 (2)	100 (2)	100 (2)
2012 [24]	PNG	Blood, urine, stool, wounds, pus			63.5 † (252)					0 (2)
<i>Klebsiella spp. and Enterobacter spp.</i>										
1984–1986 [17]	Goroka	Multiple †			95 (22)	5 (22)	6 (17)	45 (22)	36 (11)	32 (22)
<i>Enterobacter spp.</i>										
1997–1998 [54]	Goroka					57 (7)		100 (7)		
<i>Proteus mirabilis</i>										
1997–1998 [54]	Goroka					33 (3)		100 (3)		
<i>Proteus spp. and Providencia spp.</i>										
1984–1986 [17]	Goroka	Multiple †			45 (11)	18 (11)	33 (9)	82 (11)	100 (10)	55 (11)
<i>Providencia spp.</i>										
1997–1998 [54]	Goroka					0 (1)		0 (1)		
<i>Morganella morganii</i>										
1997–1998 [54]	Goroka					0 (2)		0 (2)		
<i>Pseudomonas spp.</i>										
1984–1986 [17]	Goroka	Multiple †			55 (11)	0 (12)	30 (10)	83 (12)	50 (8)	67 (12)
1997–1998 [54]	Goroka	Blood, urine, stool, wounds, pus				82 (11)		100 (11)		
2008–2009 [21]	Madang	Blood			100 (1)	0 (1)		100 (1)	100 (1)	100 (1)
<i>Acinetobacter spp.</i>										
1997–1998 [54]	Goroka					0 (1)		100 (1)		
<i>Burkholderia cepacia</i>										
1997–1998 [54]	Goroka					100		67 (3)		
<i>Burkholderia pseudomallei</i>										
1995–2005 [67]	Western Province	Clinical, envi- ronmental			0 (39)			48.7 (39)	0 (39)	
<i>Aeromonas spp.</i>										
1984–1986 [17]	Goroka	Stool, skin			75 (8)	0 (8)		13 (8)	0 (5)	0 (8)

1997–1998 [54]	Goroka		0 (1)		100 (1)				
<i>Citrobacter freundii</i>									
1997–1998 [54]	Goroka	Blood, urine, stool, wounds, pus	100 (3)		67 (3)				
<i>Alcaligenes spp.</i>									
1997–1998 [54]	Goroka		0 (1)		100 (1)				
2008–2009 [21]	Madang	Blood	100 (1)	100 * (1)	0 (1)	100 (1)	0 (1)	100 * (1)	
<i>Shigella spp.</i>									
1962–1963 [72]	Port Mo- resby	Stool			12.9 (70)	8.6 (70)			
1984–1986 [17]	Goroka	Stool	86 (94)	0 (94)	0 (94)	83 (94)	91 (54)	1 (94)	
2000–2009 [73]	Port Mo- resby	Stool	96 (98)			60 (114), 27 * (114)	86 (76)		15 (13)
2010–2011 [74]	Goroka	Stool	91.5 (47)	0 (47)		55.3 (47)	76.6 (47)	70.2 (47)	0 (47)
2014 [24]	PNG	Stool						0 § (53)	
2018 [75]	Oceania (60 samples from PNG)	Stool	70.8 (72)			49 (53)	59.7 (72)	54.2 (72)	6 (16)
<i>Salmonella spp.</i>									
1984–1986 [17]	Goroka	Stool	53 (38)	0 (38)	37 (38)	58 (38)	6 (33)	3 (38)	
2010–2011 [74]	Goroka		80 (5)	0 (5)		40 (5)	60 (5)	60 (5)	0 (5)
2014 [24]	PNG							33.3 § (15)	
<i>Campylobacter spp.</i>									
1984–1986 [17]			24 (55)	0 (55)		0 (55)	0 (55)	100 (55)	
<i>Vibrio cholerae</i>									
2009 [79]	PNG	Stool				27.8 * (36)			
2009–2011 [79]	PNG	Stool, rectal swabs	75.8 (302), 17.2 * (302)			3.1 (255), 1.6 * (244)	3.2 (282), 1.4 * (282)	1 (305), 0.7 * (305)	0.3 (300)
2010 [79]	PNG	Stool				50.5 * (212)			
2011 [79]	PNG	Stool				11.8 * (51)			
2011 [79]	PNG	Stool				9.7 (299)	38.2 (254)		
<i>Neisseria meningitidis</i>									
1984–1986 [17]	Goroka	Blood, CSF	0 (5)			0 (5)			
2009 [44]	Port Mo- resby		0	0		33 (3)			
<i>Neisseria gonorrhoeae</i>									
1989–1990 [83]	Port Mo- resby, Goroka, Ra- baul, Lae, Daru		44						
1993 [85]	PNG		12.5 (40)			7.5 (40)		0 § (40)	3.3 (30)
1994 [84]	PNG		8.7 (218)			4.1 (218)		5 § (218)	1.8 (57)

2004–2005 [87]	Port Mo- resby, Goroka, Lae, Mt Ha- gen	40 (52)	0 (52)	0 (52)	19 (52)	0 (52)	2 (52)	0 (52)	
2005 [86]	Port Mo- resby	61.1		0.7	49		1.2	5	0.7
2006 [86]	Port Mo- resby	64.7		0	17.7		1.5	2.9	0

PCN = penicillin, MET = methicillin, AMP = ampicillin/amoxicillin, CTX = ceftriaxone, GEN = gentamicin, KAN = kanamycin, STR = streptomycin, CMP = chloramphenicol, TET = tetracycline, ERY = erythromycin, COT = cotrimoxazole, TMP = trimethoprim–sulfamethoxazole, CIP = ciprofloxacin, NAL = nalidixic acid, SPC = spectinomycin, * intermediate resistance, ⁺ blood, CSF, urine, skin lesions, stool, joint aspirates, lung aspirates, [‡] unspecified third-generation cephalosporin resistance, [§] unspecified fluoroquinolone resistance.