Prevelance of Mupirocin Resistance in *Staphylococcus* spp. in the Asia-Pacific Region (2004; 2006-2008); a SENTRY Antimicrobial Surveillance Program Report

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Background

Mupirocin is widely used for the topical treatment of skin infections and to decolonize patients carrying *Staphylococcus aureus*, especially oxacillin-resistant strains. High-level resistance (HLR) has been associated with significant reductions in decolonization rates. Mupirocin resistance in *S.aureus* is increasingly being reported in many parts of the world. We examined the prevalence of mupirocin resistance among staphylococci in the Asia-Pacific region.

Table 1. Mupirocin Resistance in the Asia-Pacific Region (2004, 2007 - 2008)

	Mupirocin MIC (mg/L)					Resistance at:	
Organism (no. tested)	≤4	8	16	256	>256	>256	16-256
S. aureus (n=5,679)	5,507	11	65	16	80	1.4%	1.4%
oxacillin-resistant (n=2,324)	2,204	5	69	15	41	1.8%	3.2%
oxacillin-susceptible (n=3,355)	3,303	6	6	1	39	1.2%	0.2%
Coagulase negative species (n=867)	710	2	12	25	118	13.6%	4.3%
S. epidermidis (n=219)	147	0	11	19	42	19.2%	13.7%
S. haemolyticus (n=161)	145	0	0	0	16	9.9%	0.0%
S. hominis (n=36)	29	0	0	0	7	19.4%	0.0%

Methods

Isolates

S. aureus isolated from infected hospitalized patients in 10 countries (39 medical centres) collected from 2004, 2006 to 2008. Isolates came from patients with bacteraemia, pneumonia, complicated skin and skin structure infections, and other infections. All strains were referred to the Women's and Children's Hospital, Adelaide, Australia for testing. No isolates were collected in 2005.

Susceptibility testing

Isolates were tested using custom made dry-form broth microdilution (BMD) panels (TREK Diagnostic Systems) against a wide range of antimicrobials according to CLSI standards.[1] Breakpoints for resistance to other antimicrobial agents were those recommended by the CLSI.[2]

Quality control strains utilized included *Staphylococcus aureus* ATCC 29213 and *Enterococcus faecalis* ATCC 29212; all MIC results were within CLSI specified ranges.

Resistance Phenotypes

High-level mupirocin resistance; MIC ≥ 512 mg/L. High-level resistance is due to acquisition of the plasmid-mediated *mupA* gene

Low-level mupirocin resistance; MIC 8-256 mg/L

Results

- A total of 6,546 *Staphylococcus* spp. were tested (*S. aureus*, n=5,679; coagulase-negative staphylococci (CoNS), n=867).
- There were persistently high rates of mupirocin-resistance in CoNS; mostly among *S. epidermidis*, but occasionally in *S. haemolyticus* and *S. hominis* (Table 1). Resistance was particularly high in isolates from the Philippines (Figure 1A).
- Lower variable rates of mupirocin resistance was seen among *S. aureus*, with resistance more common in oxacillin-resistant strains (3.2% vs 0.2%); except in New Zealand.
- High-level resistance was dominant among oxacillin-resistant *S. aureus* in all countries except Korea, where low-level resistance was much more common.

Conclusions

- In most countries there was little year-to-year variation in resistance rates in either *S. aureus* or coagulase-negative species.
- There is a major reservoir of high-level mupirocin resistance in *S. epidermidis*.

Figure 1
Mupirocin-resistance by Country and Study Year

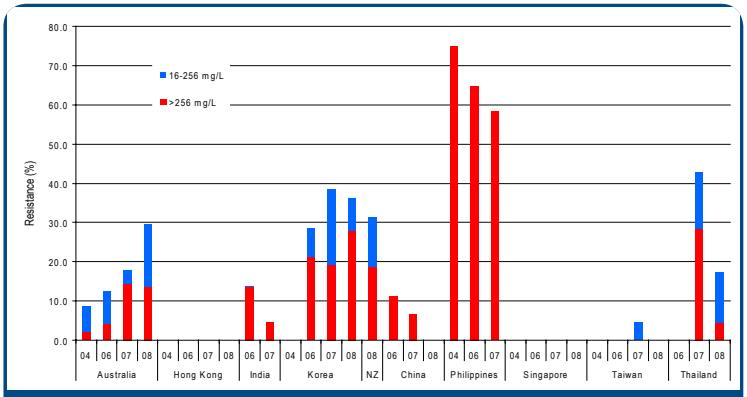

Fig 1A. Coagulase-negative *Staphylococcus* spp.

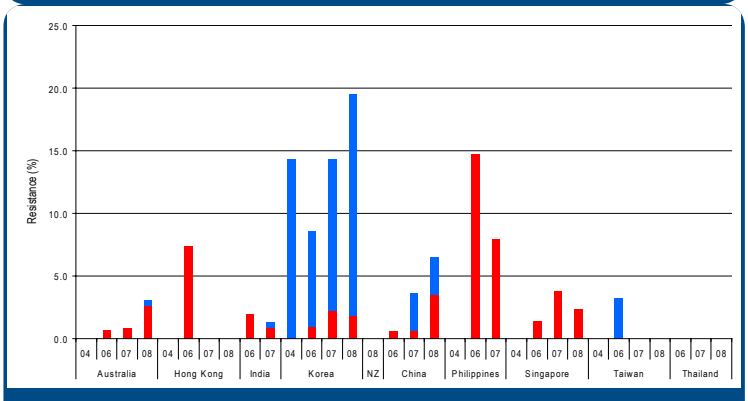

Fig 1B. Oxacillin-resistant *Staphylococcus aureus*

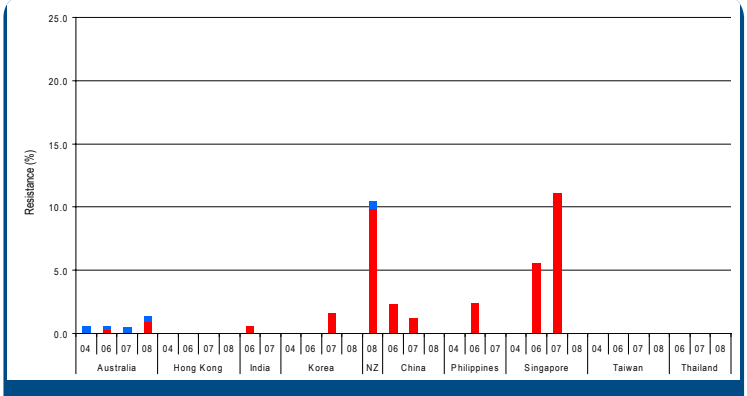

Fig 1C. Oxacillin-susceptible *Staphylococcus aureus*

REFERENCES

1. CLSI. 2009. M7-A8, Wayne, PA.
2. CLSI. 2009. 19th Informational Supplement. M100-S18. Wayne, PA.