



Antituberculosis drug resistance in New Zealand, January to June 2007

This brief half-year report collates and analyses the antimicrobial susceptibility of isolates referred to and isolated in the Mycobacteriology Reference Laboratories at Auckland City, Wellington and Waikato Hospitals during the six months January to June 2007.

During the six-month period, 114 isolates of *Mycobacterium tuberculosis* and 2 *M. bovis* isolates were identified. All isolates were tested for susceptibility to isoniazid, rifampicin, ethambutol, pyrazinamide and streptomycin. The proportion of isolates resistant to each antimicrobial is shown in Table 1.

Table 1. Resistance to each antimicrobial, January-June 2007

Antimicrobial	Number resistant ¹	Percent resistance ¹
Isoniazid (0.1 mg/L)	11	9.5
Isoniazid (0.4 mg/L) ²	4	3.5
Rifampicin	1	0.9
Ethambutol	1	0.9
Pyrazinamide	3 ³	2.6
Streptomycin	6	5.2

Notes: 1 includes resistance alone or in combination with other antimicrobials
2 all isolates resistant to the standard breakpoint concentration of 0.1 mg/L were also tested at the higher concentration of 0.4 mg/L
3 includes the two *M. bovis* isolates

Eighty-eight percent (102/116) of the isolates were fully susceptible to all five antimicrobials tested. The resistance patterns among the 116 isolates are shown in Table 2. One isolate was multidrug resistant (MDR-TB), that is, resistant to at least isoniazid and rifampicin. This MDR-TB case was a visitor from Indonesia. The isolate was not extensively drug resistant TB (XDR-TB), that is, MDR-TB with additional resistance to any fluoroquinolone and at least one of the following second-line drugs: capreomycin, kanamycin and amikacin.

Table 2. Distribution of resistance patterns, January-June 2007

	Number (%)	Resistance pattern ¹	Number (%) of isolates with each pattern
Fully susceptible	102 (87.9)		
Resistant to 1 agent	8 (6.9)	S	1 (0.9)
		Z	2 ² (1.7)
		H	5 (4.3)
Resistant to 2 agents	4 (3.5)	HS	4 (3.5)
Resistant to 3 agents	2 (1.7)	HRZ ⁴	1 (0.9)
		HES	1 (0.9)

Notes: 1 H, isoniazid resistance at the standard concentration of 0.1 mg/L; R, rifampicin; E, ethambutol; Z, pyrazinamide; S, streptomycin
2 the two *M. bovis* isolates
4 MDR-TB, multidrug-resistant tuberculosis, that is, resistant to at least isoniazid and rifampicin

The geographic distribution of resistant isolates, based on aggregated health districts, is shown in Table 3.

Table 3. Geographic distribution of resistance, January-June 2007

Antimicrobial	Percent resistance ¹			
	Northern ² (n=62)	Midland ² (n=13)	Central ² (n=19)	Southern ² (n=22)
Isoniazid ³	16.1	0	0	4.6
Rifampicin	1.6	0	0	0
Ethambutol	1.6	0	0	0
Pyrazinamide	3.2	0	5.3	0
Streptomycin	8.1	0	5.3	0

Notes: 1 includes resistance alone or in combination with other antimicrobials

2 the Northern area includes the Northland, North West Auckland, Central Auckland, and South Auckland Health Districts; the Midland area includes the Waikato, Tauranga, Eastern Bay of Plenty, Gisborne, Rotorua, Taupo, Taranaki, and Ruapehu Health Districts; the Central area includes the Hawkes Bay, Wanganui, Manawatu, Wairarapa, Hutt, Wellington, and Nelson-Marlborough Health Districts; and the Southern area includes the Canterbury, South Canterbury, West Coast, Otago, and Southland Health Districts

3 isoniazid resistance at the standard concentration of 0.1 mg/L

Six (5.2%) of the total 116 isolates were from cases categorised as tuberculosis reactivations. Compared with new cases, reactivation cases were significantly ($P \leq 0.05$) more resistant to isoniazid (66.7 vs 6.4%), rifampicin (16.7 vs 0%) and streptomycin (33.3 vs 3.6%).

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