

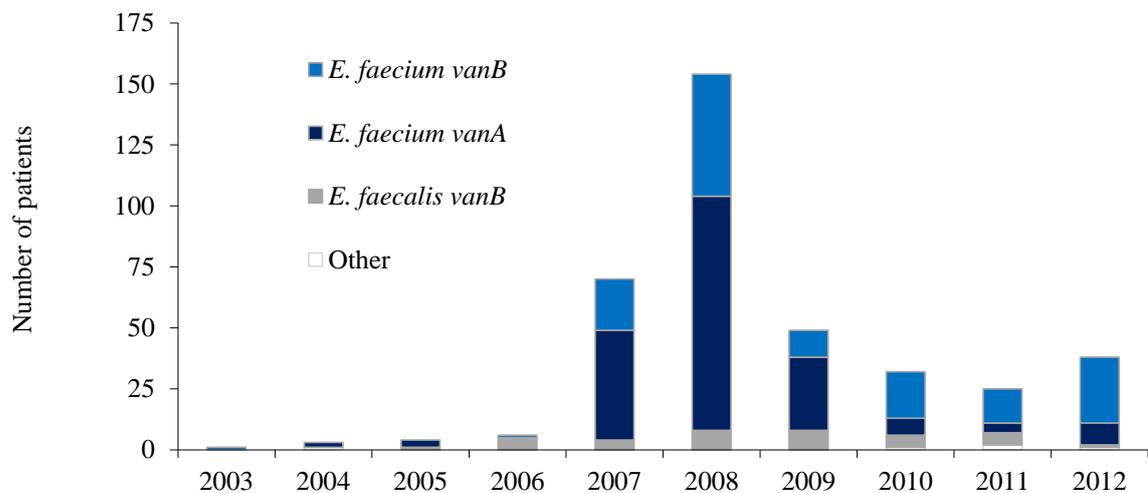
Vancomycin-resistant enterococci, 2012

Hospital and community diagnostic laboratories are requested to refer all vancomycin-resistant *Enterococcus faecium* and *E. faecalis* (VRE) isolates to ESR for the national surveillance of these resistant organisms. At ESR, the isolates are confirmed as vancomycin resistant, the *van* gene is identified by PCR, the isolates' susceptibility to a range of antibiotics is determined, and the isolates are typed by pulsed-field gel electrophoresis (PFGE).

VRE from 38 patients were confirmed in 2012. The majority (32, 84.2%) were isolated from rectal swabs or faecal specimens as the result of screening for the organism. The remaining VRE were isolated from urine (3, 7.9%) or other miscellaneous diagnostic specimens (3, 7.9%). Twenty-seven of the 38 patients had vanB *E. faecium*, 9 had vanA *E. faecium*, 1 had vanD *E. faecium* and 1 had vanB *E. faecalis*.

The species and van genotype distribution of the VRE confirmed in 2012 and the preceding 9 years is shown in Figure 1. The relatively large numbers of patients with VRE in 2007 and 2008 were due to outbreaks of vancomycin-resistant *E. faecium* in Auckland hospitals, and also to a small outbreak in Waikato Hospital in 2008.

Figure 1. Species and van genotype of VRE isolated in New Zealand, 2003-2012



In 2012, the majority (34, 87.2%) of the VRE were isolated from patients in Auckland hospitals: 64.1% (25) Auckland City Hospital, 20.5% (8) Middlemore Hospital and 2.6% (1) North Shore Hospital. A more detailed breakdown of the sources of the VRE referred in 2012 is shown in Table 1.

Table 1 also shows the various VRE strains identified by PFGE typing in 2012. Among the vanB *E. faecium* isolates, one strain, PFGE profile EfAP, was predominant and accounted for 63.0% (17/27) isolates. This strain was isolated from 14 patients in Auckland City Hospital, two patients in Middlemore Hospital and one Auckland community patient. All but one of the isolations of this strain occurred in the last two months of 2012.

Table 1. VRE referred to ESR, 2012

Species	van gene	Referred from	PFGE profile/'strain' ¹	Number of patients ²	
<i>E. faecium</i>	A	Auckland City Hospital	distinct ³	4	
		Middlemore Hospital	EfAQ	2	
			distinct	1	
		Wellington Hospital	distinct	1	
		Christchurch Hospital	distinct	1	
	B	Auckland City Hospital		EfAP	14
				EfV	3
				EfAC	1
				distinct	2
		Middlemore Hospital		EfAP	2
				EfAC	1
			distinct	2	
		Waikato Hospital	EfAC	1	
Christchurch Hospital	distinct	1			
Auckland community	EfAP	1			
D	Auckland City Hospital	distinct	1		
<i>E. faecalis</i>	B	North Shore Hospital	distinct	1	

- 1 In-house pulsed-field gel electrophoresis (PFGE) profile designations. PFGE profiles were analysed with BioNumerics software version 6.6 (Applied Maths, St-Martens-Latem, Belgium) using the Dice coefficient and unweighted-pair group method with arithmetic averages, at settings of 0.5% optimisation and 1.5% position tolerance. The PFGE profiles of isolates designated as the same strain share $\geq 90\%$ similarity. PFGE profile designations in boldface are profiles of strains that were identified prior to 2012.
- 2 VanB *E. faecium*, strain EfAC, was isolated from the same patient in two different hospitals. This patient is included in the counts for each hospital.
- 3 Distinct isolates that share $< 90\%$ PFGE profile similarity with any other VRE isolate.

The antimicrobial susceptibility among the 2012 vancomycin-resistant *E. faecium* isolates is shown in Table 2. The majority of vancomycin-resistant *E. faecium* isolates were multiresistant to ≥ 3 antibiotic classes in addition to glycopeptides.

Table 2. Resistance among vancomycin-resistant *E. faecium*, 2012¹

Antimicrobial agent ²	Percent resistance		
	vanA n=9	vanB n=27	All ³ n=37
ampicillin	100	100	100
ciprofloxacin	100	100	100
gentamicin high-level	11.1	77.8	62.2
nitrofurantoin	0.0	7.4	5.4
quinupristin/dalfopristin	11.1	0.0	2.7
streptomycin high-level	55.6	11.1	21.6
teicoplanin	100	0.0	27.0
tetracycline	77.8	85.2	83.8
multiresistant ⁴	100	92.6	94.6

- 1 Data not included for the one vanB *E. faecalis* isolate. This isolate was resistant to ciprofloxacin, high-level gentamicin and tetracycline, with the expected intrinsic resistance to quinupristin/dalfopristin.
- 2 Ampicillin, ciprofloxacin, gentamicin, linezolid and teicoplanin susceptibilities were determined by Etest minimum inhibitory concentrations (MICs). Nitrofurantoin, quinupristin/dalfopristin, streptomycin and tetracycline susceptibilities were determined by disc testing. MICs and zones of inhibition were interpreted according to the Clinical and Laboratory Standards Institute's criteria.¹ No isolate was resistant to linezolid.
- 3 Data not shown separately for the one vanD *E. faecium* isolate, but this isolate is included in the data for all *E. faecium*. The vanD *E. faecium* was resistant to ampicillin, ciprofloxacin, high-level gentamicin, teicoplanin and tetracycline.
- 4 Resistant ≥ 3 classes of antibiotics in addition to glycopeptides.

¹ Clinical and Laboratory Standards Institute. Performance standards for antimicrobial susceptibility testing; twenty-second informational supplement. Wayne, PA, USA: CLSI, 2012. CLSI document M100-S22.