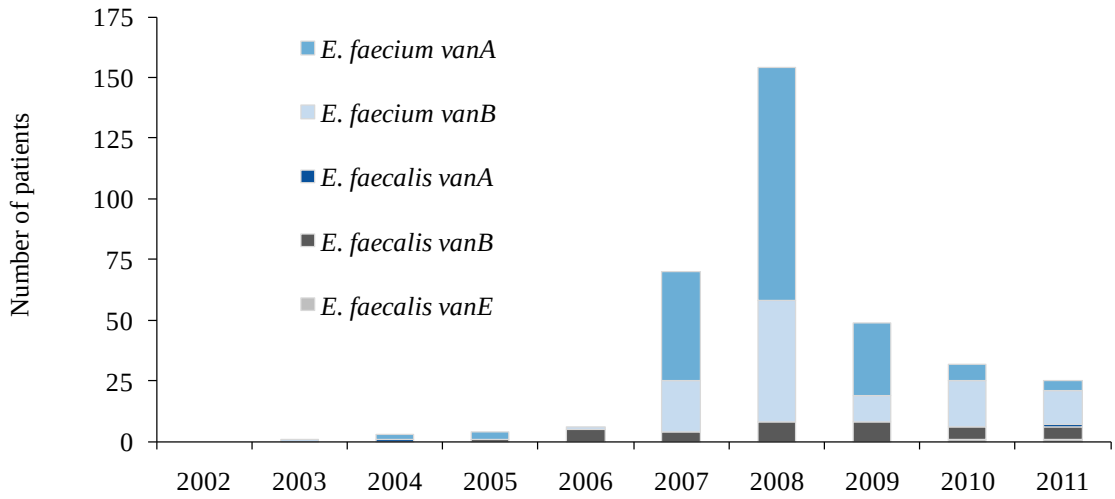
Vancomycin-resistant enterococci, 2011

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 25 patients were confirmed in 2011. The species and van genotype distribution of the VRE from these 25 patients is shown in Figure 1. Fourteen patients had vanB *E. faecium*, 5 had vanB *E. faecalis*, 4 had vanA *E. faecium*, 1 had vanA *E. faecalis* and 1 had vanE *E. faecalis*.

Figure 1. Species and van genotype of VRE isolated in New Zealand, 2002-2011



The number of VRE referred to ESR has decreased each year since 2008 (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.

In 2011, the majority (84.0%) of the VRE were isolated from patients in Auckland and Christchurch hospitals: 32.0% (8) Auckland City Hospital, 32.0% (8) Christchurch Hospital, 16.0% (4) Middlemore Hospital and 4.0% (1) The Princess Margaret Hospital in Christchurch. A more detailed breakdown of the sources of the VRE referred in 2011 is shown in Table 1.

The majority (18, 72.0%) of the VRE were isolated from rectal swabs or faecal specimens as the result of screening for the organism. The remaining VRE were isolated from urine (3, 12.0%), blood (2, 8.0%) or other miscellaneous diagnostic specimens (2, 8.0%).

Table 1 shows the various VRE strains identified by PFGE typing in 2011. There were no overwhelmingly predominant strains. However, among the vanB *E. faecium* isolates, strain EfAM was predominant and only isolated from patients in Christchurch hospitals.

Table 1. VRE referred to ESR, 2011

Species	*van* gene	Referred from	PFGE profile/'strain'[1]	Number of patients
E. faecium	A	Auckland City Hospital	distinct[2]	2
		Middlemore Hospital	distinct	1
		Wellington Hospital	distinct	1
	B	Christchurch Hospital	EfAM	3
			EfAN	2
			EfAO	1
			distinct	1
		Auckland City Hospital	**EfAC**	1
			EfV	1
			distinct	2
		Middlemore Hospital	EfAO	1
		The Princess Margaret Hospital	EfAM	1
		Nelson Hospital	**EfV**	1
E. faecalis	A	Auckland City Hospital	distinct	1
	B	Middlemore Hospital	distinct	2
		Christchurch Hospital	**EfZ**	1
		Wellington Hospital	**EfZ**	1
		Whangarei Hospital	**EfJ**	1
	E	Auckland City Hospital	distinct	1

1 In-house pulsed-field gel electrophoresis (PFGE) profile designations. PFGE profiles were analysed with BioNumerics software version 5.1 (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 ≥90% similarity. PFGE profile designations in boldface are profiles of strains that were identified prior to 2011.

2 Distinct isolates that share <90% PFGE profile similarity with any other VRE isolate.

The antimicrobial susceptibility among the 2011 VRE isolates is shown in Table 2. The majority of VRE were multiresistant to ≥3 antibiotic classes in addition to glycopeptides.

Table 2. Resistance among VRE, 2011[1]

Antimicrobial agent[2]	Percent resistance			
	E. faecium			*E. faecalis*
	vanA n=4	vanB n=14	All n=18	vanB n=5
ampicillin	100	100	100	0
ciprofloxacin	100	100	100	60.0
gentamicin high-level	50.0	64.3	61.1	80.0
quinupristin/dalfopristin	25.0	0	5.6	100[3]
streptomycin high-level	75.0	14.3	27.8	40.0
teicoplanin	100	0	22.2	0
tetracycline	75.0	35.7	44.4	60.0
multiresistant[4]	100	71.4	77.8	60.0

1 Data not included for the one vanA *E. faecalis* isolate (which was resistant to ciprofloxacin, high-level gentamicin, quinupristin/dalfopristin, high-level streptomycin, teicoplanin and tetracycline) and the one vanE *E. faecalis* isolate (which was only resistant 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 or nitrofurantoin.

3 *E. faecalis* are intrinsically resistant to quinupristin/dalfopristin.

4 Resistant ≥3 classes of antibiotics in addition to glycopeptides (quinupristin/dalfopristin resistance not included for *E. faecalis*).

[1] Clinical and Laboratory Standards Institute. Performance standards for antimicrobial susceptibility testing; twentieth informational supplement. Wayne, PA, USA: CLSI, 2011. CLSI document M100-S21.