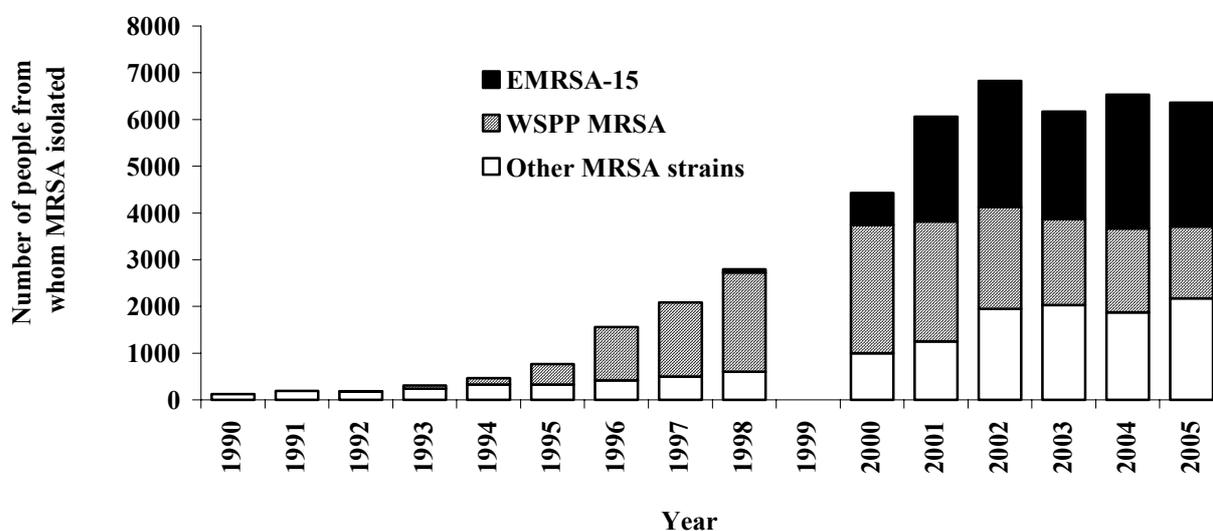


Annual survey of methicillin-resistant *Staphylococcus aureus* (MRSA), 2005

Each year since 2000, ESR has conducted a one-month survey of methicillin-resistant *Staphylococcus aureus* (MRSA) to provide information on the epidemiology of MRSA in New Zealand. Hospital and community microbiology laboratories are asked to refer all MRSA isolated during the month to ESR for typing and susceptibility testing.

The 2005 survey was conducted in August 2005, and during the month MRSA were referred from 530 people (513 patients and 17 staff). This number of referrals equates to an annual incidence rate of 170.2 per 100 000 population; similar to the 2004 rate of 174.7 per 100 000 (Figure 1). MRSA was reported as causing infection in 76.5% of the 366 patients for whom this information was provided.

Figure 1. MRSA isolations, 1990-2005



Data for 1990 to 1998 are based on continuous surveillance of all MRSA isolations. Data for 2000 to 2005 are annualised and based on one-month surveys conducted in these years. No survey was undertaken in 1999.

The majority of the MRSA isolates were the EMRSA-15 strain (41.5%), WSPP MRSA strain (24.0%), WR/AK1 MRSA strain (5.4%) or AKh4 MRSA strain (4.9%). For a description of these strains see <http://www.esr.cri.nz/competencies/communicabledisease/MRSA+strains.htm>. The proportion of MRSA that were the non-multiresistant, community WSPP MRSA decreased again in 2005 – a trend evident since 2000, when the healthcare-associated EMRSA-15 strain emerged and spread in hospitals and residential-care facilities in some parts of the country.

Among the 513 patients with MRSA, 50.9% were categorised as hospital patients and 49.1% as community patients. Patients were classified as hospital patients if they were in a healthcare facility (including residential-care facility) when MRSA was isolated or had been in a healthcare facility in the previous three months. The majority of EMRSA-15 and AKh4 MRSA (73.8% and 69.2%, respectively) were isolated from hospital patients or staff, whereas most WSPP MRSA and WR/AK1 MRSA (70.3% and 72.4%, respectively) were isolated from people in the community (Table 1).

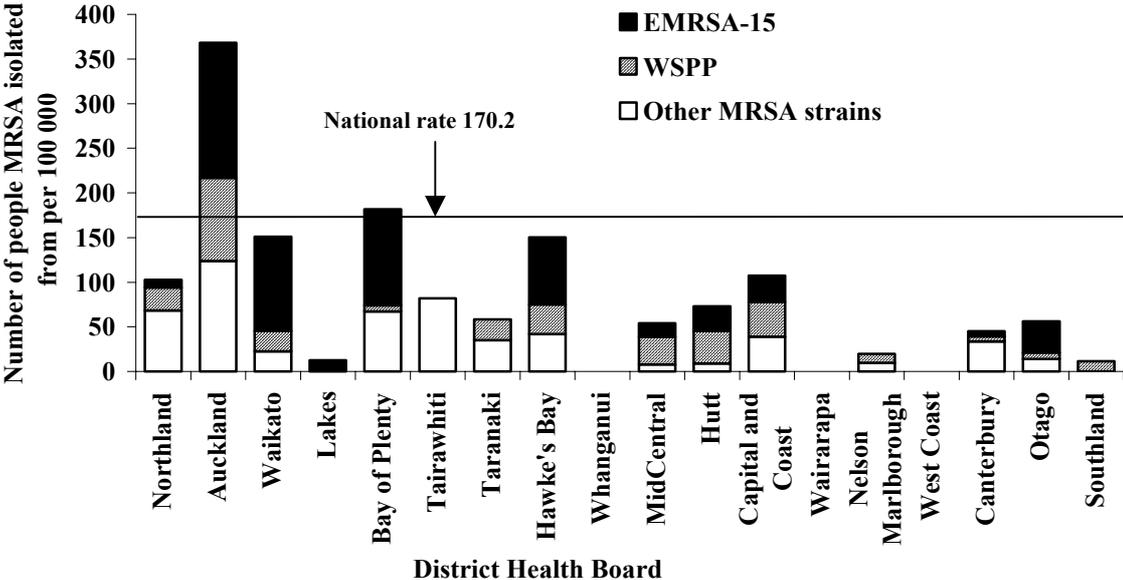
Table 1. Distribution of EMRSA-15, AKh4 MRSA, WSPP MRSA and WR/AK1 MRSA among hospital patients/staff and people in the community, August 2005

	Number (% ¹) of people with:			
	EMRSA-15	AKh4 MRSA	WSPP MRSA	WR/AK1 MRSA
Hospital patients or staff	163 (73.8)	18 (69.2)	38 (29.7)	8 (27.6%)
People in the community ²	58 (26.2)	8 (30.8)	90 (70.3)	21 (72.4)
Total	221 (100)	26 (100)	128 (100)	29 (100)

¹ proportion of all isolations of the strain
² includes healthcare workers either working in the community or being screened prior to employment

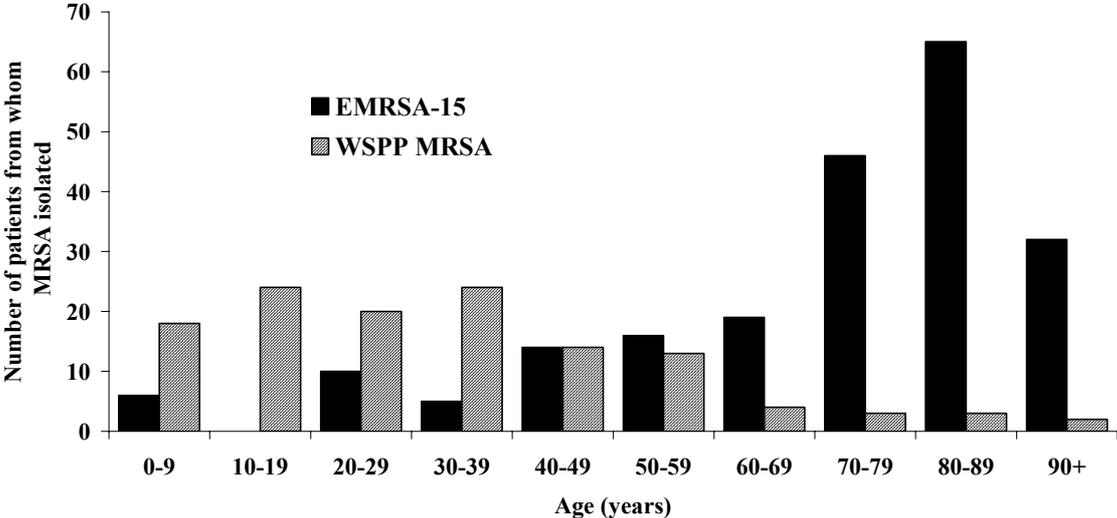
We have previously analysed the geographic distribution of MRSA according to health district boundaries. These analyses will now be according to district health board boundaries. There continue to be marked geographic variations in the incidence of MRSA in New Zealand. In 2005 the highest annualised incidence rates were in the Auckland (368.3 per 100 000), Bay of Plenty (181.9), Waikato (151.1), Hawke’s Bay (150.5), Capital and Coast (107.4), and Northland (102.8) District Health Boards (Figure 2). Differences in screening policies may contribute to some of the apparent differences in incidence.

Figure 2. Annualised incidence of MRSA by district health board, 2005



The age distribution of patients with the two most common strains was quite different, with EMRSA-15 being more frequently isolated from older patients and WSPP MRSA being more common in younger patients (Figure 3).

Figure 3. EMRSA-15 and WSPP MRSA isolations by patient age, August 2005



The antimicrobial susceptibility of the MRSA isolates referred during August 2005 is shown in Table 2. Overall, 46.3% of the isolates were multiresistant, that is, resistant to ≥ 2 classes of antibiotics in addition to β -lactams. The EMRSA-15 strain is invariably resistant to ciprofloxacin and often (70.1% in 2005) resistant to erythromycin, with inducible clindamycin resistance. The WSPP MRSA remain predominantly non-multiresistant, with only infrequent resistance to any antibiotics other than β -lactams. The WR/AK1 strain is almost invariably resistant to fusidic acid and high-level mupirocin. The AKh4 MRSA is typically multiresistant to ciprofloxacin, clindamycin (constitutive resistance), co-trimoxazole, erythromycin, gentamicin and tetracycline. All MRSA tested were susceptible to linezolid and vancomycin.

Table 2. Resistance among MRSA referred during August 2005

Antimicrobial agent (resistance breakpoint, mg/L) ¹	Percent resistance				
	All isolates (n = 533) ²	EMRSA-15 (n = 221)	WSPP (n = 128)	AKh4 (n = 26)	WR/AK1 (n = 29)
Chloramphenicol (MIC ≥32)	1.1	0	0	0	0
Ciprofloxacin (MIC ≥4)	49.7	100	0	100	0
Clindamycin (MIC ≥4) ³	9.4	4.1	0	100	0
Constitutive + inducible clindamycin ⁴	42.6	100	2.3	100	27.6
Co-trimoxazole (MIC ≥4/76)	5.4	0	0	100	0
Erythromycin (MIC ≥8)	45.2	70.1	3.1	100	27.6
Fusidic acid (MIC ≥2)	11.8	4.1	1.6	0	100
Gentamicin (MIC ≥16)	7.5	0	0.8	96.2	3.5
Mupirocin (MIC ≥8) ⁵	10.9	0.9	1.6	0	96.6 ⁶
High-level mupirocin (MIC ≥512)	8.6	0.9	0.8	0	96.6 ⁶
Rifampicin (MIC ≥4)	0.4	0	0	3.9	0
Tetracycline (MIC ≥16)	6.8	1.4	0	96.2	0
Multiresistance ⁷	46.3	71.0	0.8	100	100

¹ All isolates were susceptible to linezolid and vancomycin

² Includes isolates of two different strains from three patients

³ Constitutive clindamycin resistance

⁴ Constitutive and inducible clindamycin resistance. Erythromycin-resistant, clindamycin-susceptible isolates were tested for inducible clindamycin resistance by the D-zone test. However, only 17 of the 155 erythromycin-resistant, clindamycin-susceptible EMRSA-15 isolates were tested, as this strain is known to have inducible clindamycin resistance. All 17 EMRSA-15 isolates tested demonstrated inducible clindamycin resistance. For the constitutive + inducible clindamycin resistance percentages given for all isolates and EMRSA-15, all erythromycin-resistant, clindamycin-susceptible EMRSA-15 isolates were assumed to have inducible clindamycin resistance.

⁵ Includes low-level (MIC 8-256 mg/L) and high-level (MIC ≥512 mg/L) mupirocin resistance

⁶ One WR/AK1 MRSA isolate was mupirocin susceptible. Isolates of this strain have previously been universally resistant to high-level mupirocin. It is likely that the susceptible isolate has lost the plasmid carrying the determinants for high-level mupirocin resistance.

⁷ Resistance ≥2 classes of antibiotics in addition to β-lactams

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