

MRSA REPORT

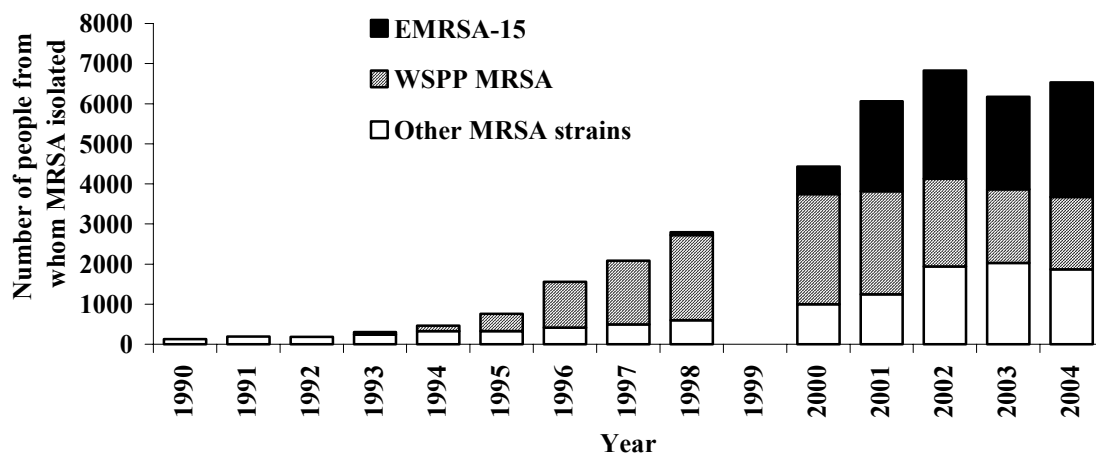
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Annual survey of methicillin-resistant *Staphylococcus aureus* (MRSA), 2004

Each year since 2000, ESR has conducted a one-month survey of all methicillin-resistant *Staphylococcus aureus* (MRSA), that is, multiresistant and non-multiresistant isolates, to complement the ongoing routine surveillance of multiresistant MRSA and to provide information on the overall epidemiology of MRSA in New Zealand. This supplement reports the 2004 survey, which was conducted in August 2004.

In August 2004, MRSA were referred from 544 people (528 patients and 16 staff). This number of referrals equates to an annual incidence rate of 174.7 per 100 000; a 6.1% increase on the rate in 2003 (164.7 per 100 000) (Figure 1). MRSA was reported as causing infection in 74.4% of the 395 patients for whom this information was provided.

Figure 1. MRSA isolations, 1990-2004



Data for 1990 to 1998 are based on continuous surveillance of all MRSA isolations. Data for 2000 to 2004 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 (43.3%), WSPP MRSA strain (27.3%), AKh4 MRSA strain (6.9%) or WR/AK1 MRSA strain (4.2%). For a description of these strains, see earlier issues of the *MRSA Report*: EMRSA-15, *MRSA Report* 99/3; WSPP MRSA, *MRSA Report* 94/5 and 94/17; AKh4 MRSA, *MRSA Report* 01/50; and WR/AK1 MRSA, *MRSA Report* 98/38. The increase in MRSA in New Zealand from the mid-1990s to 2000 was driven by the spread and almost total dominance of the non-multiresistant, community WSPP MRSA. However, since 2000 the WSPP MRSA has represented a decreasing proportion of the MRSA isolations, and since 2001 the actual number of WSPP MRSA isolations has also decreased (Figure 1). There has been a concomitant rise in isolations of the EMRSA-15 strain.

Among the 528 patients with MRSA, 52.8% were categorised as hospital patients and 47.2% 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 (72.3% and 84.2%, respectively) were isolated from hospital patients or staff, whereas most WSPM MRSA (67.3%) were isolated from people in the community (Table 1).

Table 1. Distribution of EMRSA-15, AKh4 MRSA and WSPM MRSA among hospital patients/staff and people in the community, August 2004

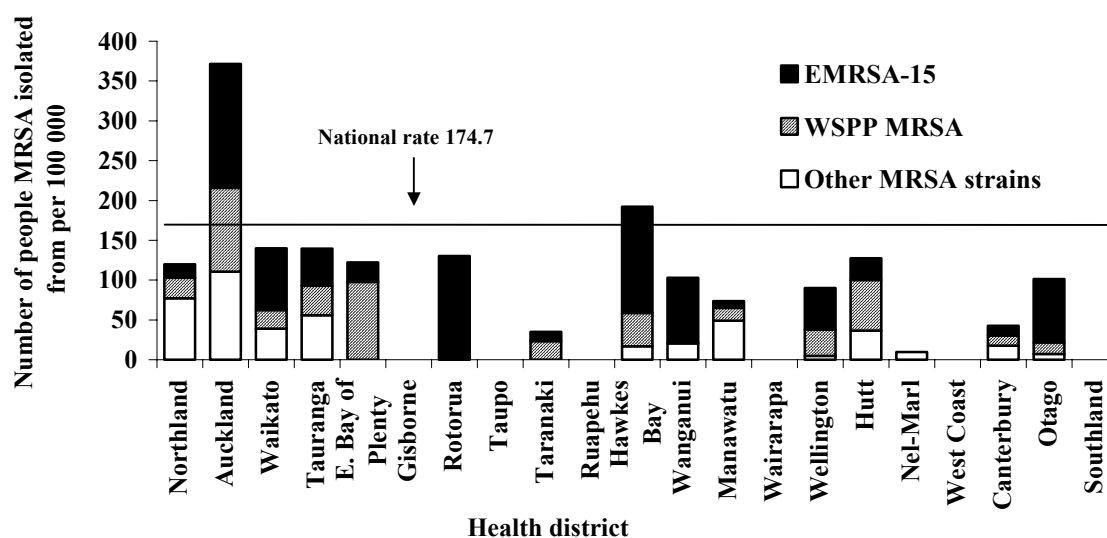
	Number (% ¹) of people with:		
	EMRSA-15	AKh4 MRSA	WSPM MRSA
Hospital patient or staff	172 (72.3)	32 (84.2)	49 (32.7)
People in the community ²	66 (27.7)	6 (15.8)	101 (67.3)
Total	238 (100)	38 (100)	150 (100)

¹ proportion of all isolations of the strain

² includes healthcare workers either working in the community or being screened prior to employment

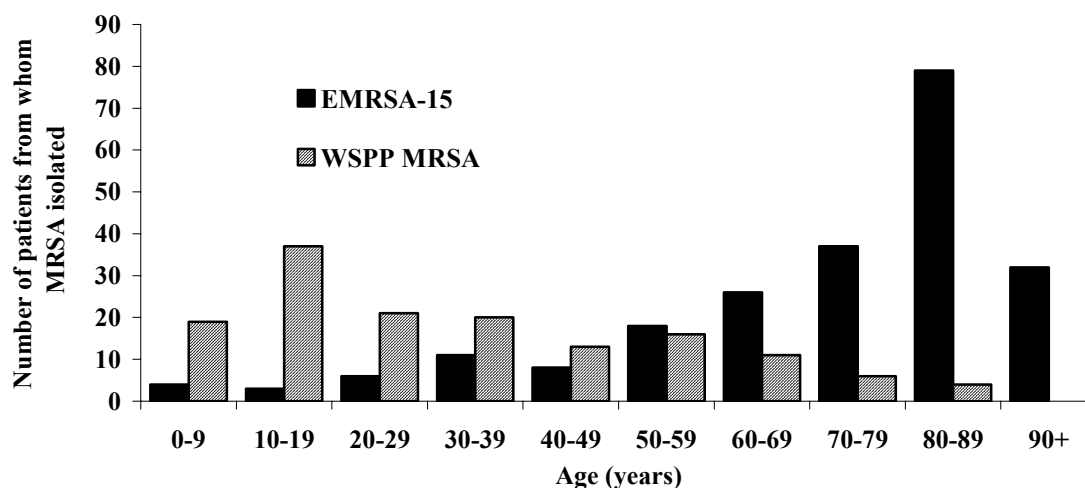
There continue to be marked geographic variations in the incidence of MRSA in New Zealand. In 2004 the highest annualised incidence rates were in the Auckland (371.3 per 100 000), Hawkes Bay (192.3), Waikato (140.0), Tauranga (139.4), Rotorua (130.2), Hutt (127.4), Eastern Bay of Plenty (122.3), Northland (119.9), Wanganui (102.8), and Otago (101.1) Health Districts (Figure 2).

Figure 2. Annualised incidence of MRSA by health district, 2004



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

Figure 3. EMRSA-15 and WSPP MRSA isolations by patient age, August 2004



The antimicrobial susceptibility of the MRSA isolates referred during August 2004 is shown in Table 2. Overall, 51.8% 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 usually (80.7% in 2004) 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 AKh4 MRSA is typically multiresistant to ciprofloxacin, clindamycin (constitutive resistance), co-trimoxazole, erythromycin, gentamicin and tetracycline. The WR/AK1 strain is invariably resistant to fusidic acid and high-level mupirocin. All MRSA tested were susceptible to linezolid and vancomycin.

Table 2. Resistance among MRSA referred during August 2004

Antimicrobial agent (resistance breakpoint, mg/L) ¹	Percent resistance				
	All isolates (n = 550) ²	EMRSA-15 (n = 238)	WSPP (n = 150)	AKh4 (n = 38)	WR/AK1 (n = 23)
Chloramphenicol (MIC ≥32)	0.7	0	0.7	0	0
Ciprofloxacin (MIC ≥4)	52.4	100	0	94.7	0
Clindamycin (MIC ≥4) ³	10.6	5.9	0	97.4	0
Constitutive + inducible clindamycin ⁴	47.8	80.7	2.0	100	13.0
Co-trimoxazole (MIC ≥4/76)	7.5	0	0	100	0
Erythromycin (MIC ≥8)	50.0	80.7	3.3	100	13.0
Fusidic acid (MIC ≥2)	8.0	1.3	0	2.6	100
Gentamicin (MIC ≥16)	8.4	0.4	0	100	0
Mupirocin (MIC ≥8) ⁵	8.0	0	1.3	2.6	100
High-level mupirocin (MIC ≥512)	7.3	0	0.7	2.6	100
Rifampicin (MIC ≥4)	0.4	0.4	0.7	0	0
Tetracycline (MIC ≥16)	10.2	2.9	2.0	100	4.4
Multiresistance ⁶	51.8	81.9	2.0	100	100

¹ All isolates were susceptible to linezolid and vancomycin

² Includes isolates of two different strains from four patients and three different strains from one patient

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 22 of the 178 erythromycin-resistant, clindamycin-susceptible EMRSA-15 isolates were tested, as this strain is known to have inducible clindamycin resistance. All 22 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 Resistance ≥2 classes of antibiotics in addition to β-lactams

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