

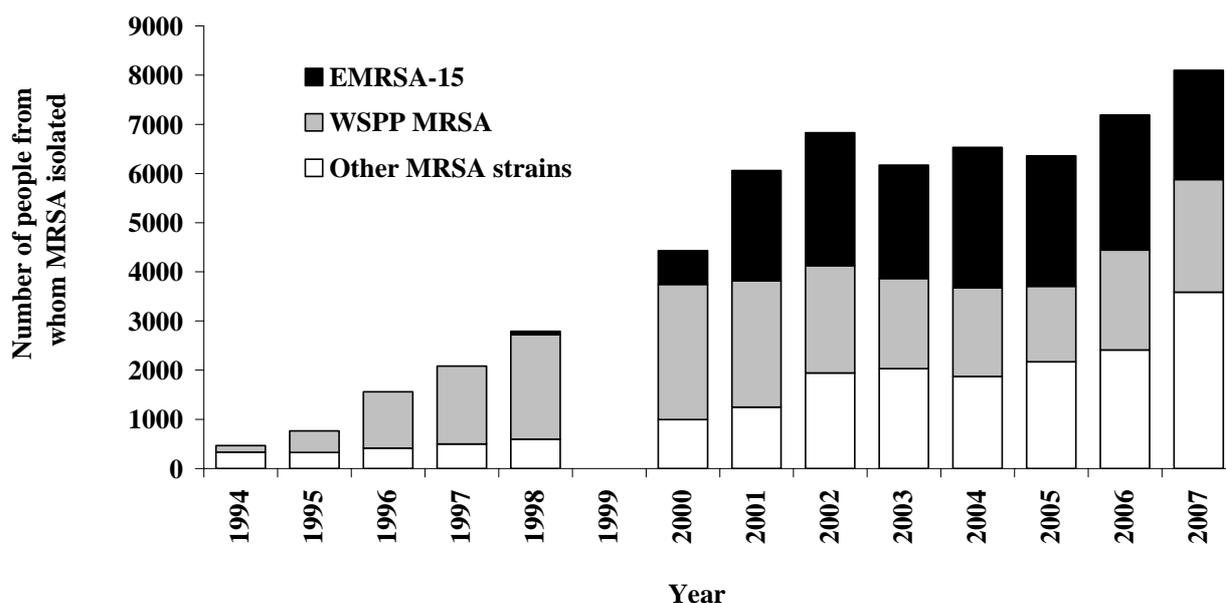
## Annual survey of methicillin-resistant *Staphylococcus aureus* (MRSA), 2007

Each year ESR conducts a one-month survey of methicillin-resistant *Staphylococcus aureus* (MRSA) to provide ongoing 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.

The 2007 survey was conducted in August 2007, and during the month MRSA were referred from 675 people (664 patients and 11 staff). This number of referrals equates to an annualised incidence rate of 191.5 per 100 000 population; an 11.4% increase on the 2006 rate of 171.9.

Among the 664 patients with MRSA, 50.6% were categorised as hospital patients and 49.4% 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. MRSA was reported as causing infection in 79.2% of the 572 patients for whom this information was provided.

**Figure 1. MRSA isolations, 1994-2007**



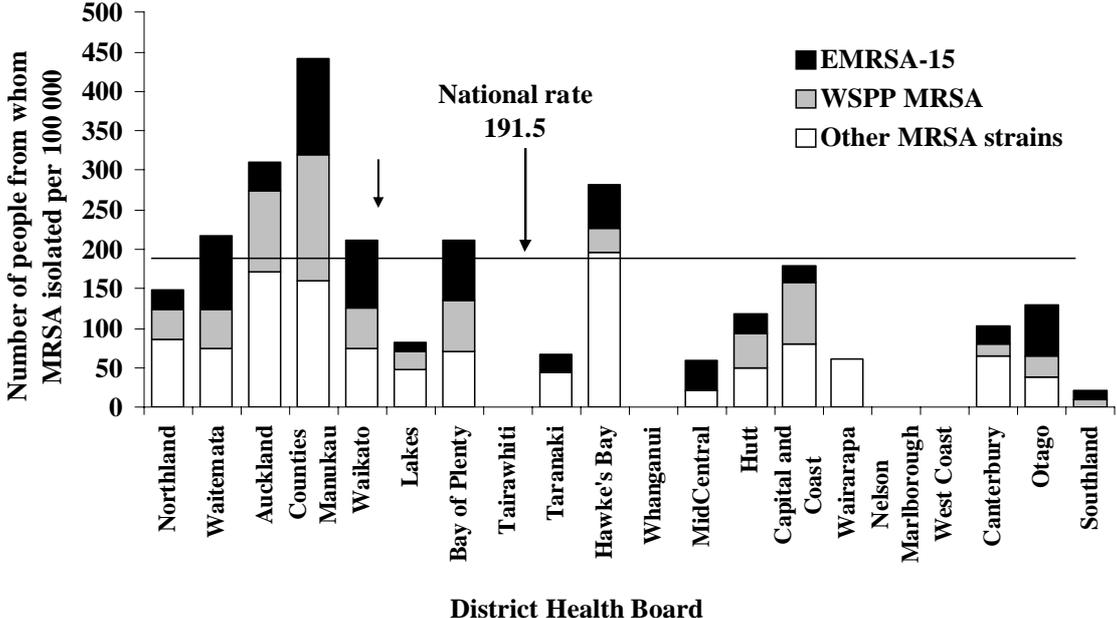
Data for 1994 to 1998 are based on continuous surveillance of all MRSA isolations. Data for 2000 to 2007 are annualised and based on one-month surveys conducted in these years. No survey was undertaken in 1999.

Six MRSA strains were predominant in 2007 and represented 80.7% of all MRSA isolations. Internationally, MRSA clones are often described in terms of their multilocus sequence type (ST) and *SCCmec* cassette type (*SCCmec*). This information is included in the following descriptions of the six most common strains.

- WSPP MRSA [ST30, SCC*mec* type IV]: a non-multiresistant community strain of MRSA usually resistant to only  $\beta$ -lactam antibiotics. In 2007, WSPP MRSA was the dominant strain and accounted for 28.2% of the MRSA isolated, with the majority (72.8%) from people in the community. The increase in MRSA in New Zealand from the mid-1990s to 2000 was driven by the spread and almost total dominance of this strain. However, since 2001, WSPP MRSA has represented a smaller proportion of the MRSA isolations (Figure 1).
- EMRSA-15 [ST22, SSC*mec* type IV]: a British epidemic MRSA strain that is ciprofloxacin resistant with variable erythromycin susceptibility. Erythromycin-resistant EMRSA-15 isolates have inducible clindamycin resistance. In 2007, this strain accounted for 27.3% of the MRSA isolated. 2007 was the first year since 2002 that EMRSA-15 has not been the dominant MRSA strain (Figure 1). This strain is typically isolated from elderly patients in hospital and other healthcare facilities. In 2007, 79.5% of the EMRSA-15 isolates were from patients classified as hospital patients or from healthcare staff.
- WR/AK1 MRSA [ST1, SCC*mec* type IV]: a multiresistant community strain of MRSA, usually resistant to fusidic acid and high-level mupirocin with variable erythromycin susceptibility. The strain accounted for 9.7% of the MRSA isolated in 2007, with the majority (56.1%) from people in the community. This strain is now typically isolated from children and young adults in the North Island.
- AK3 MRSA [ST5, SCC*mec* type IV]: a non-multiresistant strain, with variable susceptibility, but often fusidic acid or erythromycin resistant, or resistant to only  $\beta$ -lactams. In 2007, this strain accounted for 9.3% of the MRSA isolated, with the majority (65.1%) from people in the community. This strain was first identified during the 2005 survey among isolates from the Auckland area. While it is now sporadically isolated throughout the country, in 2007, 76.6% of AK3 MRSA were isolated in the greater Auckland area. It is usually isolated from children and young adults.
- DN1 MRSA [ST8, SCC*mec* type IV]: a multiresistant strain frequently erythromycin resistant with variable ciprofloxacin susceptibility. Erythromycin-resistant isolates do not have inducible clindamycin resistance. In 2007, DN1 MRSA accounted for 3.1% of the MRSA isolated. **This strain is indistinguishable from the USA300 MRSA strain which is a community-associated strain now widely disseminated in the United States.** However, in 2007 in New Zealand, this strain was most commonly isolated from hospital patients (61.9%) rather than community patients. DN1 MRSA was first identified in 2004 in the Dunedin area and has subsequently been isolated throughout New Zealand.
- AKh4 MRSA [ST 239, SCC*mec* type III]: a multiresistant MRSA typical of multiresistant MRSA isolated in Australia, and resistant to ciprofloxacin, clindamycin, co-trimoxazole, erythromycin, gentamicin and tetracycline. This strain accounted for 3.0% of the MRSA isolated in 2007. Like EMRSA-15, AKh4 MRSA is most commonly isolated from hospital patients, with 85.0% of the isolations in 2007 from hospital patients.

There are marked geographic variations in the incidence of MRSA in New Zealand (Figure 2). In previous years, we have aggregated the data for the three district health boards (DHBs) in the Auckland area, as we were not able to identify the DHB for community patients. However, this data was available in 2007 and therefore we have calculated an incidence rate for each of the three DHBs. The highest annualised incidence rates were in the Counties Manukau (441.6 per 100 000), Auckland (310.2), Hawke’s Bay (282.4), Waitemata (217.4), Bay of Plenty (212.5) and Waikato (210.7) DHBs. Differences in screening policies may contribute to some of the apparent differences in incidence.

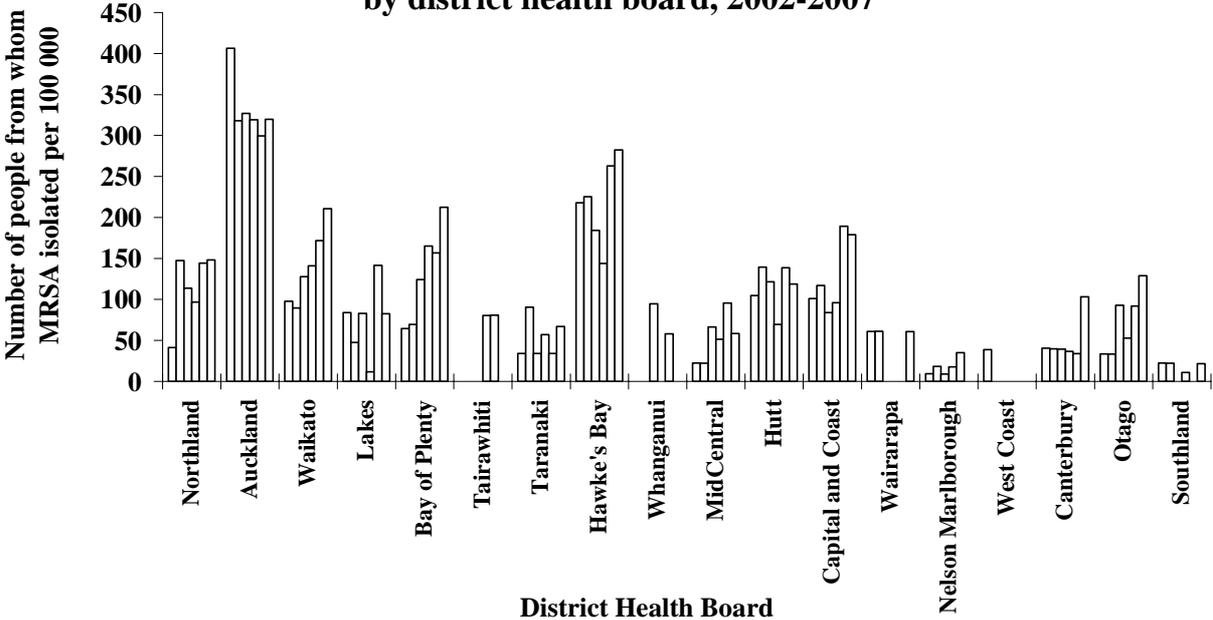
**Figure 2. Annualised incidence of MRSA by district health board, 2007**



Data for the Canterbury and South Canterbury DHBs are combined.

The incidence of MRSA in each DHB area over the last 6 years, 2002-2007, is shown in Figure 3. Poisson regression analysis indicated that there were significant ( $P < 0.05$ ) increases in the incidence of MRSA in the Northland, Waikato, Lakes, Bay of Plenty, Tairāwhiti, Hawke's Bay, MidCentral, Capital and Coast, Canterbury, and Otago DHBs. There were significant decreases in the combined Waitemata/Auckland/Countries Manukau, Wairarapa, and Southland DHBs. This analysis was based on very small numbers (0-5 people with MRSA during the one-month survey period) in the Tairāwhiti, Whanganui, Wairarapa, Nelson Marlborough, West Coast and Southland DHBs. Nationally over the same 6 years there was a significant increase in the incidence of MRSA.

**Figure 3. Annualised incidence of MRSA by district health board, 2002-2007**



The series of bars for each DHB represent the individual years 2002 to 2007 from left to right.

Data for the three DHBs in the greater Auckland area (Waitemata, Auckland and Counties Manukau) are combined, and similarly data for the Canterbury and South Canterbury DHBs are combined.

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