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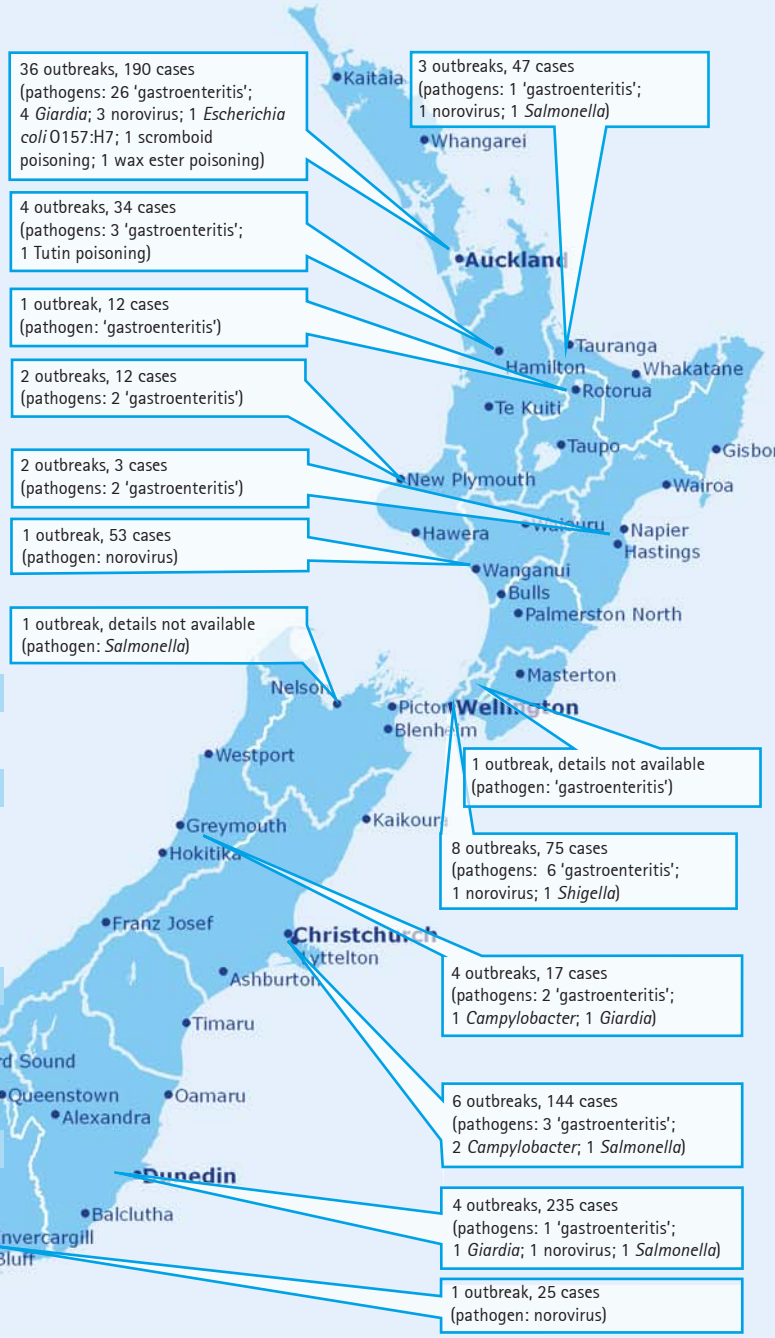
New Zealand Public Health Surveillance Report

June 2008: Covering January - March 2008

Contents & Highlights

This Quarter's Outbreaks

Notification and outbreak data in this issue are drawn from the January – March quarter of 2008. The outbreak map on this page consists of all outbreak information, final and interim. The total number of outbreaks and cases by region and outbreaks by pathogen are reported, as notified up to 9 April 2008.



The latest reports from STI Surveillance, Antimicrobial Resistance, Virology and Enteric Reference Laboratory are available at www.surv.esr.cri.nz

1. Editorial

Summary of notifiable diseases surveillance for 2007

In 2007, there were 19,383 cases of notifiable diseases reported through EpiSurv, the National Notifiable Disease database. This is lower than the number reported in any of the previous seven years (23,219 in 2006; 22,553 in 2005; 22,340 in 2004; 22,759 in 2003; 21,586 in 2002; 20,357 in 2001; and 20,003 in 2000).

Between 2006 and 2007 there were some significant changes to the number of cases reported for individual diseases. There was a statistically significant increase in reported cases of dengue fever (19 to 114, 500.0%), mumps (47 to 75, 59.6%), rheumatic fever (107 to 140, 30.8%), cryptosporidiosis (737 to 924, 25.4%), giardiasis (1,214 to 1,401, 15.4%) and hydatid disease (0 to 6).

There was a statistically significant decrease in reported cases of rickettsial disease (12 to 2, 83.3%), pertussis (1,120 to 331, 70.4%), hepatitis A (123 to 42, 65.9%), chemical poisoning from the environment (28 to 13, 53.6%), meningococcal disease (160 to 106, 33.8%), gastroenteritis (937 to 621, 33.7%), campylobacteriosis (15,873 to 12,776, 19.5%) and tuberculosis disease (354 to 290, 18.1%).

Both the pertussis and meningococcal disease notification rates continue to show significant decreases. In 2007, the pertussis rate dropped from 26.8 to 7.8 per 100,000 population. The 2007 pertussis notification rate was below the 2003 rate (14.5 per 100,000 population), the year in between the current and the previous pertussis epidemic, but above the 1998 rate (4.0 per 100,000 population), the year before the start of the previous epidemic. The meningococcal disease rate dropped in 2007, from 3.8 to 2.5 per 100,000 population. Although the meningococcal disease rate is well down on the peak annual rate observed during the epidemic (16.7 per 100,000 population in 2001), the rate remains higher than before the start of the epidemic in 1989-90 (1.5 per 100,000 population).

Mumps and acute hepatitis A disease were the only other vaccine preventable diseases to show a significant change in notification rate compared to 2006, with an increase for mumps (1.1 to 1.8 per 100,000 population) and a decrease for hepatitis A (2.9 to 1.0 per 100,000 population).

Enteric diseases continued to comprise the overwhelming majority of disease notifications in 2007. In particular, at 12,776 notifications, campylobacteriosis contributed 65.9% of all disease notifications. There were statistically significant decreases in the notification rate of campylobacteriosis and gastroenteritis (379.3 to 302.2 per 100,000 population and 22.4 to 14.7, respectively). In contrast, two enteric diseases, cryptosporidiosis and giardiasis, had statistically significant rate increases compared to 2006 (17.6 to 21.9 per 100,000 population and 29.0 to 33.1, respectively).

During 2007, there was a statistically significant increase in reported cases of hydatid disease and dengue fever, and a statistically significant decrease in reported cases of rickettsial disease. There was no evidence of recent locally acquired hydatid disease and all dengue fever cases had a history of overseas travel, predominantly to the Cook Islands (65.8% of cases). For rickettsial disease, neither of the two reported cases had travelled overseas during the incubation period and *Rickettsia typhi* was reported as the pathogen for both cases.

In 2007, 31 cases of Acquired Immune Deficiency Syndrome were notified. The 2007 notification rate (0.7 per 100,000 population) is the same as the 2006 rate (0.7 per 100,000 population, 29 cases).

For outbreaks, there were 492 reported outbreaks involving 7,988 cases in 2007. This represented a slight decrease in the number of outbreaks but an increase in the number of cases compared to 2006 figures (495 outbreaks with 6,302 cases). The most common pathogen implicated was norovirus with 206 of the outbreaks and 5,902 of the cases, followed by *Cryptosporidium* spp. with 29 outbreaks and 102 cases. The most common setting linked to an outbreak was a rest/retirement home (130 outbreaks, 3,695 cases), followed by the home (96 outbreaks, 541 cases).

For a more detailed report see
www.surv.esr.cri.nz/surveillance/annual_surveillance.php

Population & Environmental Health Programme, ESR

2. Notifiable Disease Surveillance

The following is a summary of disease notifications for the January – March quarter of 2008 and cumulative notifications and rates calculated for a 12-month period (April 2007 – March 2008). For comparative purposes notification numbers and rates are presented in brackets for the same periods in the previous year. A robust method of constructing 95% confidence intervals is used to determine 'statistically significant differences' throughout this report unless otherwise stated [see Newcombe, R. G. and D. G. Altman. Proportions and their differences. In: *Statistics with Confidence*. 2000. BMJ Books. Bristol]. Data contained within this report are based on information recorded in EpiSurv by public health service staff up to 9 April 2008. As this information may be updated over time, these data should be regarded as provisional.

National surveillance data tables are available online (www.surv.esr.cri.nz).

VACCINE PREVENTABLE DISEASE

Haemophilus influenzae type b

- *Notifications:* 5 notifications in the quarter (2007, 6); 14 notifications over the last 12 months (2007, 14) giving a rate of 0.3 cases per 100,000 population (2007, 0.3); no change
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (0 cases); 2 cases were aged under 5 years, of these, 1 was immunised; of the remaining 3 cases, 1 case was immunised and the immunisation status was unknown for 2 cases

Measles

- *Notifications:* 1 notification in the quarter (2007, 5); 20 notifications over the last 12 months (2007, 18) giving a rate of 0.5 cases per 100,000 population (2007, 0.4); not a statistically significant increase
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (9 cases); lab confirmation status was unknown

Mumps

- *Notifications:* 36 notifications in the quarter (2007, 20); 91 notifications over the last 12 months (2007, 58) giving a rate of 2.2 cases per 100,000 population (2007, 1.4); a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (20 cases); 22 notifications were laboratory confirmed

Pertussis

- *Notifications:* 64 notifications in the quarter (2007, 105); 291 notifications over the last 12 months (2007, 851) giving a rate of 6.9 cases per 100,000 population (2007, 20.3); a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (105 cases)

Rubella

- *Notifications:* 0 notifications in the quarter (2007, 1); 10 notifications over the last 12 months (2007, 7) giving a rate of 0.2 cases per 100,000 population (2007, 0.2); no change
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (5 cases)

INFECTIOUS RESPIRATORY DISEASES

Acute Rheumatic Fever

- *Notifications:* 86 notifications in the quarter (2007, 14); 212 notifications over the last 12 months (2007, 101) giving a rate of 5.0 cases per 100,000 population (2007, 2.4); a statistically significant increase

- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (12 cases) and from the same quarter last year (14 cases). Cases were distributed by age as follows: 1 (1-4 years), 12 (5-9 years), 27 (10-14 years), 23 (15-19 years), 23 (20-49 years); 79 cases were initial attacks of acute rheumatic fever and 7 cases were recurrent attacks

Meningococcal Disease

- *Notifications:* 22 notifications in the quarter (2007, 17); 110 notifications over the last 12 months (2007, 146) giving a rate of 2.6 cases per 100,000 population (2007, 3.5); a statistically significant decrease
- *Comments:* cases were distributed by age as follows: 2 (under 1 year), 6 (1-4 years), 6 (5-9 years), 3 (10-14 years), 1 (15-19 years), and 4 (over 40 years); 6 cases were the epidemic strain

ENTERIC INFECTIONS

Campylobacteriosis

- *Notifications:* 1,762 notifications in the quarter (2007, 4,644); 9,896 notifications over the last 12 months (2007, 16,159) giving a rate of 234.0 cases per 100,000 population (2007, 386.2); a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (3,056 cases) and from the same quarter last year (4,644 cases)

Gastroenteritis

- *Notifications:* 176 notifications in the quarter (2007, 172); 625 notifications over the last 12 months (2007, 784) giving a rate of 14.8 cases per 100,000 population (2007, 18.7); a statistically significant decrease
- *Comments:* note that this is not a notifiable disease per se except in persons with a suspected common source or with a high risk occupation, and the term 'gastroenteritis' provides a catch-all category for enteric diseases that are not notifiable and for syndromic reports that come through public health units, including direct reports from the public where the causative pathogen may never be known

Listeriosis

- *Notifications:* 9 notifications in the quarter (2007, 4); 31 notifications over the last 12 months (2007, 16) giving a rate of 0.7 cases per 100,000 population (2007, 0.4); a statistically significant increase
- *Comments:* no cases were aged under 1 year

Salmonellosis

- *Notifications:* 495 notifications in the quarter (2007, 374); 1,395 notifications over the last 12 months (2007, 1,259) giving a rate of 33.0 cases per 100,000 population (2007, 30.1); a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (349 cases) and from the same quarter last year (374 cases)

Shigellosis

- *Notifications:* 25 notifications in the quarter (2007, 26); 125 notifications over the last 12 months (2007, 87) giving a rate of 3.0 cases per 100,000 population (2007, 2.1); a statistically significant increase

Typhoid

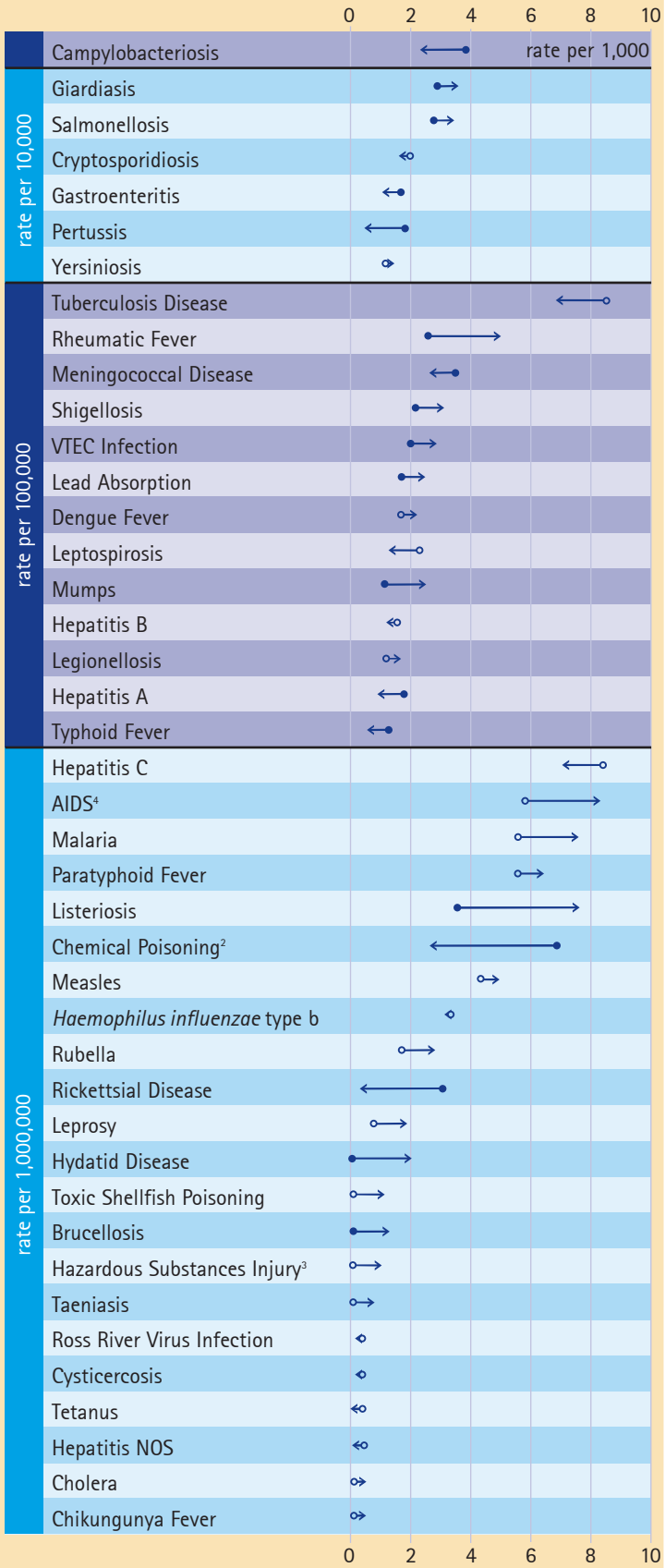
- *Notifications:* 8 notifications in the quarter (2007, 23); 33 notifications over the last 12 months (2007, 57) giving a rate of 0.8 cases per 100,000 population (2007, 1.4); a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (23 cases)

VTEC Infections

- *Notifications:* 51 notifications in the quarter (2007, 31); 120 notifications over the last 12 months (2007, 83) giving a rate of 2.8 cases per 100,000 population (2007, 2.0); a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (24 cases) and from the same quarter last year (31 cases)

National Surveillance Data

12-Monthly Notification Rate Changes[1]



Notifications per 1,000 or 10,000 or 100,000 or 1,000,000 persons

Rate Change Symbol Key:

- > Rate increase from the previous 12-month period
- < Rate decrease from the previous 12-month period
- ● Statistically significant rate change
- ○ Statistically non-significant rate change

[1]Rates are calculated for the 12-month period April 2007 – March 2008 and compared to previous 12-month rates
[2]From the environment
[3]Hazardous Substance Injury became notifiable in EpiSurv as of 19 September 2007
[4]Data provided by the AIDS Epidemiology Group, University of Otago

ENVIRONMENTAL EXPOSURES & INFECTIONS

Chemical Poisoning

- *Notifications:* 0 notifications in the quarter (2007, 2); 11 notifications over the last 12 months (2007, 29) giving a rate of 0.3 cases per 100,000 population (2007, 0.7); a statistically significant decrease

Cryptosporidiosis

- *Notifications:* 83 notifications in the quarter (2007, 213); 794 notifications over the last 12 months (2007, 856) giving a rate of 18.8 cases per 100,000 population (2007, 20.5); not a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (272 cases) and from the same quarter last year (213 cases)

Giardiasis

- *Notifications:* 422 notifications in the quarter (2007, 404); 1,420 notifications over the last 12 months (2007, 1,302) giving a rate of 33.6 cases per 100,000 population (2007, 31.1); a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (316 cases)

Hepatitis A

- *Notifications:* 19 notifications in the quarter (2007, 17); 44 notifications over the last 12 months (2007, 77) giving a rate of 1.0 cases per 100,000 population (2007, 1.8); a statistically significant decrease
- *Comments:* cases were aged between 6 and 81 years, with 5 cases under the age of 16 years

Lead Absorption

- *Note:* since June 2007 the blood lead level for reporting has lowered from 0.72 to 0.48 µmol/l
- *Notifications:* 53 notifications in the quarter (2007, 24); 107 notifications over the last 12 months (2007, 78) giving a rate of 2.5 cases per 100,000 population (2007, 1.9); a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (31 cases) and from the same quarter last year (24 cases). Cases were distributed by age as follows: 2 (1-4 years), 2 (5-14 years), 2 (15-24 years), 10 (25-44 years), 30 (45-64 years), 6 (over 65 years), and 1 of unknown age; 45 male cases, 7 female cases, and 1 of unknown sex. 13 cases recorded an occupation that involved exposure to lead: painter (6 cases), and builder, construction worker, meat process worker and radiator repairer (1 case each), and 3 cases not specified. Of the remaining 40 cases, 3 recorded hobbies involving exposure to lead: shooting (2 cases), and house renovation (1 case). Only 33 of the 47 notifications (6 had unknown blood lead levels) would have been reported under the previous blood lead level threshold

Leptospirosis

- *Notifications:* 27 notifications in the quarter (2007, 27); 66 notifications over the last 12 months (2007, 89) giving a rate of 1.6 cases per 100,000 population (2007, 2.1); not a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (14 cases); 18 male cases, 9 female cases; 4 dairy cattle farmers/workers, 4 meat process workers, 2 slaughterers, 2 farmers (not further defined), 8 cases did not participate in a high risk occupation for leptospirosis exposure, and 7 cases did not have an occupation recorded

Yersiniosis

- *Notifications:* 190 notifications in the quarter (2007, 143); 574 notifications over the last 12 months (2007, 516) giving a rate of 13.6 cases per 100,000 population (2007, 12.3); not a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (138 cases) and from the same quarter last year (143 cases)

NEW, EXOTIC & IMPORTED INFECTIONS

Brucellosis

- *Notifications:* 1 notification in the quarter (2007, 0); 5 notifications over the last 12 months (2007, 0) giving a rate of 0.1 cases per 100,000 population (2007, 0.0); a statistically significant increase
- *Comments:* the case was in Tonga during the incubation period

Dengue Fever

- *Notifications:* 34 notifications in the quarter (2007, 62); 86 notifications over the last 12 months (2007, 77) giving a rate of 2.0 cases per 100,000 population (2007, 1.8); not a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (14 cases) and a statistically significant quarterly decrease from the same quarter last year (62 cases); 32 notifications were laboratory confirmed; 32 cases were overseas during the incubation period and the travel history of 2 cases was unknown. Places visited were Botswana (1), Saudi Arabia (1), Sri Lanka (2), Thailand (2), Cambodia (2), Vietnam (1), Malaysia (2), Philippines (1), Timor-Leste (3), Australia (3), New Caledonia (1), Tonga (18), and Fiji (3)

Hydatid Disease

- *Notifications:* 2 notifications in the quarter (2007, 0); 8 notifications over the last 12 months (2007, 0) giving a rate of 0.2 cases per 100,000 population (2006, 0.0); a statistically significant increase
- *Comments:* 1 case is thought to have acquired the disease approximately 40 years ago when he worked on a farm and the other case travelled overseas during the incubation period

Rickettsial Disease

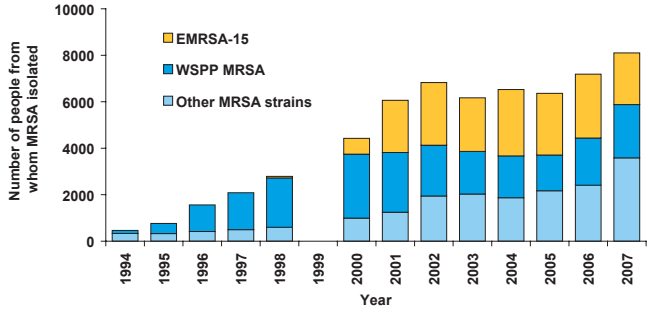
- *Notifications:* 0 notifications in the quarter (2007, 0); 2 notifications over the last 12 months (2007, 13) giving a rate of 0.0 cases per 100,000 population (2007, 0.3); a statistically significant decrease

3. Other Surveillance Reports

Annual survey of MRSA, August 2007

ESR conducts annual one-month surveys of methicillin-resistant *Staphylococcus aureus* (MRSA) to provide information on the epidemiology of MRSA in New Zealand. The 2007 survey was conducted in August 2007. During that month, MRSA were referred from 675 people (664 patients and 11 staff) (Figure 1). This number of referrals equates to an annual incidence rate of 191.5 per 100,000 – an 11.4% increase on the 2006 rate of 171.9 per 100,000.

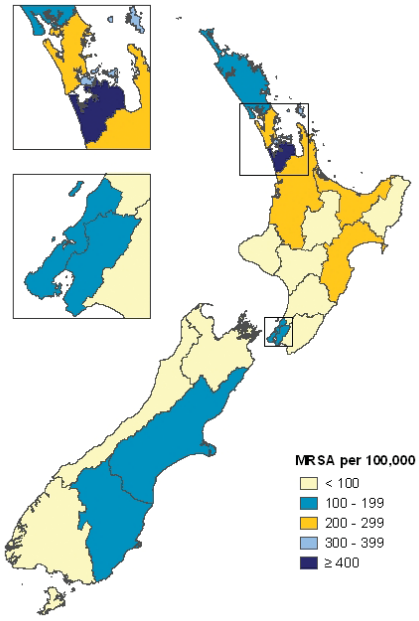
Figure 1. MRSA isolations, 1994–2007*



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

There are marked geographic variations in the incidence of MRSA in New Zealand (Figure 2). In 2007, 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 DHB, 2007



Six MRSA strains were predominant in 2007 and represented 80.7% of all MRSA isolations. As has been the situation for the last seven years, the two most commonly identified MRSA strains were the WSPP MRSA strain, which accounted for 28.2% of isolates, and the EMRSA-15 strain, which accounted for 27.3% of isolates (Figure 1). The prevalence of other strains was: WR/AK1 MRSA strain, 9.7%; AK3 MRSA strain, 9.3%; USA300 MRSA strain, 3.1%; and AKh4 MRSA strain, 3.0%. For a description of these MRSA strains, see www.surv.esr.cri.nz/PDF_surveillance/Antimicrobial/aMRSA_2007.pdf.

MRSA was reported as causing infection in 79.2% of the 572 patients for whom this information was provided. 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 three months before MRSA was isolated. The majority of EMRSA-15, USA300 MRSA and AKh4 MRSA (80%, 62% and 85%, respectively) were isolated from hospital patients or staff, whereas most WSPP MRSA, WR/AK1 MRSA and AK3 MRSA (73%, 56% and 65%, respectively) were isolated from people in the community.

The EMRSA-15 strain is invariably resistant to ciprofloxacin and often (about two-thirds) resistant to erythromycin, with inducible clindamycin resistance. The WSPP MRSA strain remains predominantly non-multiresistant, with only infrequent resistance to any antibiotics other than β-lactams. The WR/AK1 MRSA strain is almost invariably resistant to fusidic acid and usually also mupirocin resistant with variable erythromycin susceptibility. The AK3 MRSA strain has variable susceptibility, but is often fusidic acid or erythromycin resistant, or resistant to only β-lactams. The USA300 MRSA strain is frequently erythromycin resistant (without inducible clindamycin resistance) and has variable ciprofloxacin susceptibility. The AKh4 MRSA is multiresistant to ciprofloxacin, clindamycin, co-trimoxazole, erythromycin, gentamicin and tetracycline.

For a more detailed report see www.surv.esr.cri.nz/PDF_surveillance/Antimicrobial/aMRSA_2007.pdf

Reported by Helen Heffernan, Communicable Disease Programme, ESR

4. Outbreak Surveillance

The following information is a summary of the outbreak trends for New Zealand, from data collected in the last quarter (January – March 2008). Comparisons are made to the previous quarter (October – December 2007), and to the same quarter in the previous year (January – March 2007). Note that the outbreak data in this section are notified to ESR by the Public Health Services.

General

- 74 outbreaks notified in this quarter (847 cases)
- 40 are 'final' reports (444 cases); 34 are 'interim' reports (403 cases) that have yet to be finalised and closed

All following data pertain to final reports only.

- 11.1 cases on average per outbreak, compared with 20.8 cases per outbreak in the previous quarter (14.7 cases per outbreak in the same quarter of last year)
- 2 hospitalisations: gastroenteritis (1) and *Shigella* (1)
- no deaths

Pathogens

- 26 'gastroenteritis' outbreaks (364 cases) during this quarter
- 4 *Giardia* outbreaks (8 cases)
- 4 norovirus outbreaks (40 cases)
- 2 *Campylobacter* outbreaks (4 cases)
- 2 *Salmonella* outbreaks (16 cases)
- 1 histamine (scromboid) fish poisoning outbreak (2 cases)
- 1 *Shigella* outbreak (10 cases)

Modes of Transmission

Note that reporting allows for multiple modes of transmission to be selected. In many instances no mode of transmission is selected for outbreaks notified to ESR, consequently, numbers may not add up to the total number of outbreaks reported.

- 25 person-to-person, from (non-sexual) contact with an infected person (including droplets): 15 gastroenteritis (293 cases), 4 *Giardia* (8 cases), 3 norovirus (36 cases), 1 *Campylobacter* (2 cases), 1 *Salmonella* (10 cases) and 1 *Shigella* (10 cases)
- 15 foodborne, from consumption of contaminated food or drink (excluding water): 9 gastroenteritis (66 cases), 3 norovirus (14 cases), 1 *Giardia* (2 cases), 1 histamine (scromboid) fish poisoning (2 cases) and 1 *Shigella* (10 cases)
- 7 environmental, from contact with an environmental source (e.g. swimming): 4 gastroenteritis (130 cases), 2 *Giardia* (4 cases) and 1 *Campylobacter* (2 cases)
- 1 waterborne, from consumption of contaminated drinking water: 1 *Giardia* (2 cases)
- 5 'other' mode of transmission: 4 gastroenteritis (via fomites) (65 cases) and 1 *Giardia* (2 cases)
- 5 'unknown' mode of transmission: 3 gastroenteritis (7 cases), 1 *Campylobacter* (2 cases) and 1 *Salmonella* (6 cases)

Circumstances of Exposure/Transmission

Common 'settings' where exposure/transmission occurred or contaminated food/beverage was prepared for consumption are identified below. Note that multiple settings can be selected and in many instances no settings are selected in outbreaks notified to ESR.

- 9 rest home: 7 gastroenteritis (181 cases), 1 *Campylobacter* (2 cases) and 1 norovirus (26 cases)
- 8 café: 7 gastroenteritis (22 cases) and 1 norovirus (4 cases)

Circumstances of Exposure/Transmission continued

- 8 home: 3 *Giardia* (6 cases), 1 *Campylobacter* (2 cases), 1 gastroenteritis (3 cases), 1 histamine (scromboid) fish poisoning (2 cases), 1 norovirus (3 cases) and 1 *Shigella* (10 cases)
- 4 hospital (continuing care): 4 gastroenteritis (67 cases)
- 4 takeaways: 2 gastroenteritis (4 cases), 1 norovirus (3 cases) and 1 *Salmonella* (6 cases)
- 3 hospital (acute care): 3 gastroenteritis (30 cases)
- 2 camp: 2 gastroenteritis (51 cases)
- 2 caterers: 1 gastroenteritis (39 cases) and 1 norovirus (7 cases)
- 1 school: norovirus (7 cases)
- 1 supermarket: gastroenteritis (3 cases)
- 5 'other' setting: 2 gastroenteritis (49 cases), 2 *Giardia* (4 cases), and 1 histamine (scromboid) fish poisoning (2 cases)
- 1 outbreak with no setting selected: *Salmonella* (10 cases)

5. Outbreak Case Reports

Measles outbreak in Auckland, December 2007

While the incidence of notified measles in New Zealand is currently low[1], suboptimal vaccination coverage[2] means a measles epidemic remains possible. In December 2007, measles was identified in an unvaccinated boy from Auckland who had recently returned from a trip to India with his mother. Investigation revealed that his mother had experienced a similar illness prior to that in her son: this was confirmed to have been measles. An outbreak investigation and response was initiated by Auckland Regional Public Health Service. This report summarises the results of the investigation, which identified two further cases of epidemiologically-linked measles.

The index case (Case 1) was an unvaccinated European woman in her mid-20s who developed fever, cough and coryza on 25 November at the end of a month-long trip to India. She returned to New Zealand on 27 November, developed a rash on 30 November, was hospitalised on 2 December and discharged with a diagnosis of a chest infection with *Haemophilus influenzae*. Following the diagnosis of Case 2, serologic testing was sought on a 5 December specimen, retrospectively confirming the diagnosis of measles on 13 December.

Case 2 was the unvaccinated 7-year-old son of the index case who had accompanied his mother to India. He presented with fever, cough and conjunctivitis on 5 December, developed a rash on 9 December and was hospitalised on the same day. The diagnosis was confirmed by serology.

Case 3 was the index case's brother, a hospital inpatient whose only exposure to the index case occurred when he left hospital for one day to visit the index case's household on 28 November. He developed cough and coryza on 11 December and a rash on 14 December; Koplik's spots were observed on medical examination, and measles was serologically confirmed. He developed measles pneumonitis requiring a tracheostomy and ventilation, and remained in intensive care for 13 days. Vaccination history was unclear; IgG levels were equivocal.

Case 4 was also a brother of the index case, visiting her household multiple times during her and her son's periods of infectivity. He developed cough, coryza and conjunctivitis on approximately 18 December and a rash on 22 December. He was assessed at a hospital emergency department on 24 December, at which time Koplik's spots were noted, but was not admitted. Measles was confirmed by serology.

Case management and contact tracing was conducted according to the Control of Communicable Diseases Manual[3]. Susceptible contacts were defined as those born after 1968 and without a history of measles or measles vaccination. The following groups in the community were assessed and advised: index case's contacts on flight to New Zealand on 27 November (31), index case's household (1 person in addition to Cases 2, 3 and 4); index case's social contacts (3); school contacts of Case 2 (45); staff of community house visited by Case 3 (9); social contacts of Case 4 (1). No contacts were eligible for immunoglobulin; four school contacts were given measles, mumps and rubella (MMR) vaccination. All community contacts who had been last exposed to a confirmed case less than 21 days previously were given measles information and advised to seek medical attention promptly if prodromal symptoms developed. All were kept under active surveillance for 21 days following last exposure, and none developed measles symptoms.

In addition to community contacts, the four cases had nine separate episodes of contact with three different hospitals while infectious, including emergency department assessments and admission episodes. A total of 248 healthcare staff (including ambulance officers) and 47 patients were considered to have been exposed to one or more of the cases and required assessment for susceptibility. Measles serology testing was sought on those identified as susceptible: of these, three staff were non-immune and stood down from duties, and one patient was non-immune and was isolated. No secondary cases of measles developed among healthcare staff or patients.

This measles outbreak was limited to a first generation of transmission, solely to individuals with close household contact with infectious cases. There are several likely reasons why further propagation of the outbreak was restricted. Firstly, the cases had limited social contacts in the community while infectious, with the exception of Case 2's school contacts and Case 3's community house contacts, though in each of these settings measles vaccination coverage or immunity was high. Secondly, while each case had contact with multiple healthcare staff and patients, measles immunity among these groups was also high. Thirdly, a comprehensive public health and clinical infection control response commenced promptly after each case notification.

Despite the limited measles transmission in this incident, this outbreak illustrates the potential risk associated with imported measles. Measles virus is highly infectious, and an estimated 95% of the population must have measles immunity to prevent recurrent outbreaks. Local outbreaks in populations with a measles seroprevalence lower than this threshold may be triggered by non-immune travellers returning from countries with high measles incidence (such as India[4], as in this case).

All cases were seen at hospital during their infectious periods, and all except one were admitted. The potential for a nosocomial outbreak was therefore high, as has eventuated elsewhere[5]. On receiving a measles notification, public health authorities should rapidly assess whether the case visited a hospital during their infectious period, and alert those responsible for hospital infection control on the risk to staff and patients.

In this context, prevention, early detection and rapid response to measles cases acquired internationally are critical. Healthcare providers should strongly encourage prior MMR vaccination in unvaccinated individuals planning travel to high incidence countries; measles should be considered as a possible diagnosis for unvaccinated returning travellers with fever and maculopapular rash; and appropriate infection control practices must be utilised to prevent measles transmission in healthcare settings. Above all, MMR vaccine coverage among children must be improved.

1 Institute of Environmental Science and Research Ltd 2007. Notifiable and other diseases in New Zealand: Annual Report 2006. ESR, Porirua.

2 Ministry of Health 2008. Immunisation coverage [cited 29 Feb 2008]. Available from http://www.moh.govt.nz/moh.nsf/indexmh/immunisation-coverage-data

3 Ministry of Health 1998. Communicable Disease Control Manual. Ministry of Health, Wellington.

4 Desai VK, Kapadia SJ, Kumar P, Nirupam S 2003. Study of measles incidence and vaccination coverage in slums of Surat City. *Indian Journal of Community Medicine* 28: 10-4.

5 Marshall TM, Hlatswayo D, Schoub B 2003. Nosocomial outbreaks: a potential threat to the elimination of measles? *Journal of Infectious Diseases* 187 Supp1: S97-101.

Reported by Craig Thornley, Medical Officer of Health, and Brad Novak, Public Health Medicine Registrar, Auckland Regional Public Health Service

Norovirus outbreak associated with a commercial indoor playground in the Bay of Plenty Region

On 11 December 2007, Toi Te Ora – Public Health were alerted by a member of the community that children attending a Christmas party at a large indoor playground in the Bay of Plenty on 7 December had since

become unwell with diarrhoea and vomiting. The premises in question are a large warehouse containing a multi-level indoor adventure playground, with equipment including jumping castles and ball pools. The centre includes a café, which caters for group functions.

A case was defined as any person attending the party who experienced diarrhoea or vomiting within 24-72 hours after the event. Toi Te Ora staff obtained a list of attendees and conducted telephone interviews of all families to ascertain how many people attended the party, how many became unwell, as well as details regarding the nature and onset of symptoms. Detailed food histories were not taken. Faecal specimens were requested from those who were still unwell. An inspection of the playground was conducted.

Out of 24 families, two were unable to be contacted and were excluded from the analyses. A total of 28 cases were identified out of 96 attendees (29.2%). These included 20 out of 58 children (34.5%) and eight out of 38 adults (21.1%). All became unwell suddenly from 9-12 December, with 61% experiencing diarrhoea and vomiting, 25% diarrhoea only, and 14% vomiting only. Symptoms resolved completely within 24-48 hours. No attendees reported being unwell in the 72 hours prior to the party. The playground operators had not received any similar reports of illness amongst visitors or staff in that period.

One case had a faecal specimen positive for rotavirus. Further testing for other pathogens in this sample had been halted once the rotavirus was isolated. The Toi Te Ora team felt the clinical picture of this outbreak was more suggestive of a norovirus gastroenteritis (the illness was short-lived, affected adults as well as children and did not cause watery diarrhoea) so sought specimens from further cases. The first two of these specimens were both positive for norovirus, so no further specimens were requested.

The party was an exclusive private function held after the close of the centre's usual business hours. A set finger-food menu was provided by the centre for the children, and parents brought their own food to share for the adults. Approximately 110 people visited the playground earlier on the day of the function.

The following points were noted from the playground inspection:

(1) The active ingredients of the cleaning products used at the centre were not listed on the labels, so their effectiveness against infective agents was unknown.

(2) Cleaning of the play structure was performed weekly.

(3) The ball pit was sprayed daily, and the balls were removed and thoroughly cleaned in a machine once every 4-6 weeks.

(4) The centre is predominantly carpeted, and had not been steam-cleaned recently.

Norovirus is known to be highly infectious and environmentally hardy. It can be transmitted via person to person contact, food, water or environmental contamination. Even though one case tested positive for rotavirus, the two positive samples for norovirus in conjunction with the clinical picture led us to conclude that norovirus was the agent responsible for this outbreak. Person-to-person transmission, at the time of the party, was considered to be the most likely cause of this outbreak. The illness affected both children and adults, but particularly the children, who would have had more personal contact. No index case was identified as the cause of this outbreak. Recall amongst the parents as to pre-existing illness may also not be accurate, or they may be reluctant to admit taking a recently unwell child to a party. Of particular note, a number of parents reported returning their child to day-care and other parties less than 24 hours after the resolution of symptoms, rather than the recommended 48 hours.

This investigation cannot exclude a food-borne source for the outbreak. Detailed food histories and food sampling were not conducted due to a limited public health workforce capacity at the time, the high cost of testing samples for norovirus, and the low level of concern generated amongst the parents by a mild illness that resolved quickly.

Environmental contamination may also have contributed as a route of infection. A number of opportunities were identified at the playground where this could have occurred. The large carpeted area and equipment such as the ball-pools would make it exceptionally hard to eliminate norovirus from surfaces under the current cleaning practices. Whilst the playground received no reports of illness amongst other users of the centre, these other attendees were independent visitors, and any illness may not have been recognised as part of an outbreak.

We recommended that the playground operators:

(1) Seek information regarding the ingredients and effectiveness of their cleaning products from the suppliers.

(2) Implement a policy of excluding children suffering from vomiting and diarrhoea, similar to those required in licensed early childhood centres.

(3) Provide paper towels in the nappy changing area, to place between baby and table. Provide larger nappy bins, or more frequent collection of the existing bin.

(4) Improve cleaning procedures to include a list of non-daily tasks, as well as verification/sign-off of tasks.

(5) Institute a policy for regular cleaning of carpet.

(6) Establish procedures for disinfecting premises after an outbreak.

(7) Display stickers to encourage hand-washing amongst staff and visitors.

A number of factors relating to the nature of indoor playgrounds may facilitate the spread of infectious diseases – they are frequented by large numbers of young children, and both direct person-to-person and environmental contamination of shared, difficult to clean equipment, is possible. Indoor commercial playgrounds are not currently regulated, and hygiene standards and operating practices are up to the individual proprietors. This outbreak raises the question of whether this industry should be subject to some form of regulated standards, such as those for early childcare centres. This outbreak also highlights the need to emphasise to parents the importance of not returning children to day-care until symptom-free for at least 48 hours.

Reported by Belinda Loring, Public Health Medicine Registrar, Stephen Layne, Health Protection Officer, Jim Miller, Medical Officer of Health, Neil de Wet, Public Health Medicine Registrar, and Lynnette Borissenko, Communicable Disease Co-ordinator, Toi Te Ora Public Health

6. Pathogen Surveillance

Unless otherwise reported, pathogen surveillance covers the January – March 2008 quarter.

ENTERIC PATHOGENS

The Enteric Reference Laboratory (ERL) is responsible for the confirmation of the following notifiable diseases *Salmonellae, Shigellae, Vibrio cholerae* O1 and VTEC.

Salmonella (ERL)

Human and non-human Salmonella isolate data are available at www.surv.esr.cri.nz/enteric_reference/enteric_reference.php

- 488 human and 249 non-human isolates were confirmed (2007, 423 and 170 respectively)
- 53 further isolates of *S.* Chester (25 reported in Volume 6 Issue 1), no common food source identified. No matching PFGE profiles to Australian strains to date
- 28 cases *S.* Mbandaka predominately from Nelson-Marlborough. PFGE profile indistinguishable from isolates from the poultry industry. No common food source identified to date
- case control studies were undertaken for both outbreaks

VTEC/STEC (ERL)

- 48 isolates of *E. coli* O157:H7 were laboratory confirmed (2007, 29)
- 23 cases *Stx*1, *Stx*2, *eaeA*, *hlya*, phage type 21 were tested by PFGE
- 13 were indistinguishable (Auckland, Wellington, Taranaki)
- 5 were also indistinguishable from each other but closely related to the above (Auckland, Nelson-Marlborough, Canterbury)
- 1 closely related but distinct from the above (Northland)
- remaining 4 distinct profiles (Auckland, Waikato, Wellington)
- intensive investigation by Public Health Units did not identify a common food source

Norovirus (Norovirus Reference Laboratory)

- 27 confirmed norovirus outbreaks, of which 10 (37.0%) occurred in an institutional setting - rest homes (9) and a hospital (1)
- other outbreaks occurred in catered food settings (4), in childcare centres (4), in a university hostel, at a scout jamboree, on a military exercise, and on a cruise ship. No information on setting was available for 4 outbreaks
- the majority of norovirus outbreak strains identified belonged to Genogroup II (19, 70.3%) although there were also 7 outbreaks associated with Genogroup I strains and 1 outbreak where both Genogroup I and II norovirus strains were identified during this quarter
- genotyping showed that the predominant genotype again was GII/4, accounting for at least 11 outbreaks, including 6 outbreaks in healthcare institutions. All GII/4 strains typed as 2006b variants. Other genotypes identified were GI/3, GI/8, GII/6, and GII/10
- in 2007, the GII/6 strain was responsible for a total of 13 outbreaks, including rest homes, childcare centres and a flower show. The large outbreak at the international Scout jamboree over the New Year period was caused by this norovirus strain. Effective public health procedures were successful in containing this outbreak to ~150 cases among 3,000 scouts

LEGIONELLOSIS AND ENVIRONMENTAL LEGIONELLA

- 14 cases were laboratory-identified this quarter
- all laboratory-identified cases have been notified to the PHU, as a result of the newly instigated laboratory-notification procedures
- all laboratory-identified cases involved sporadic community acquired cases, with 2 deaths and no outbreaks identified
- of the 14 cases identified, 12 fitted the confirmed case definition and 2 fitted the probable case definition
- the 12 confirmed cases demonstrated either antibody titres >512 on two or more occasions (3 cases), or at least a four-fold rise in antibody titre by the legionella IFAT (1 case), or were culture-positive (8 cases)
- the 2 probable cases demonstrated either a single antibody titre of >512 or were urinary antigen test-positive
- *L. pneumophila* serogroup 1 was identified as the causative agent in 5 cases, including 1 death
- *L. pneumophila* serogroup 5 was identified as the causative agent in 1 case
- *L. longbeachae* serogroup 1 was identified in 5 cases, including 1 death
- *L. longbeachae* serogroup 2 was identified in 2 cases
- in a further *L. longbeachae* case the serogroup could not be identified
- *Legionellae* isolated from domestic drinking and recreational water systems included *L. anisa, L. feeleii* and *L. pneumophila* serogroup 1
- *Legionellae* isolated from industrial water systems including cooling towers included *L. anisa* and *L. pneumophila* serogroups 1, 4, 5, 6, 7 & 8
- *Legionellae* isolated from composts and soils included *L. bozemanii, L. gormanii, L. longbeachae* serogroups 1 & 2, and *L. sainthelensi*

RESPIRATORY VIRUSES

Influenza Virus

- 4 influenza viruses were reported from laboratory-based surveillance (2007, 5)
- 2 were identified as influenza A, 1 was further subtyped by PCR as A/H1 from South Auckland
- 2 were identified as influenza B

Respiratory Syncytial Virus, Rhinovirus & Parainfluenza Virus

- 3 cases of respiratory syncytial virus were reported (2007, 4)
- 5 cases of parainfluenza 1, 3 cases of parainfluenza type 2 and 2 cases of parainfluenza type 3 were reported (2007, 1)

ADENOVIRUSES AND ENTEROVIRUSES

Adenoviruses

- 139 adenoviruses were reported (2007, 125)
- 119 adenoviruses were serotyped as adenovirus type 1 (3), type 2 (5), type 3 (40), type 4 (5), type 5 (3), type 8 (52), type 19 (1), type 37 (1) and untypable (9)

Enteroviruses

- 29 enteroviruses were reported (2007, 31)
- 13 enteroviruses were serotyped as Coxsackie A10 (1), Coxsackie A16 (1), Echovirus 6 (3), Echovirus 7 (2), Echovirus 11 (3), Echovirus 30 (1) and Enterovirus type 71 (2)

MYCOLOGY

A table detailing the biannual summary of opportunistic mycoses and aerobic actinomycetes in New Zealand for the period July – December 2007 is available at www.surv.esr.cri.nz/surveillance/NZPHSR.php

SPECIAL BACTERIOLOGY

Listeria monocytogenes

- 7 isolates of *Listeria monocytogenes* from human cases were referred (for table of human *L. monocytogenes* cases giving more details see www.surv.esr.cri.nz/surveillance/NZPHSR.php)
- all cases were in adults who were elderly and/or had underlying illness

Corynebacterium diphtheriae

- 29 isolates of *Corynebacterium diphtheriae* were received for toxigenicity testing, typing and surveillance purposes
- 28 isolates were from cutaneous sources, of which 22 were var. *mitis* and 6 were var. *gravis* strains
- 1 isolate was from a blood culture and was a var. *gravis* strain
- cases were from Auckland, Rotorua, Wellington and Christchurch
- 1 cutaneous isolate was determined to be toxigenic, the rest were determined to be non-toxigenic by PCR examination for the toxin gene

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Contributions to this publication are invited in the form of concise reports on surveillance issues or outbreak investigations.

Please send contributions to:
Scientific Editor,
New Zealand Public Health Surveillance Report,
ESR,
PO Box 50-348,
Porirua, 5240
New Zealand.
Phone: (04) 914 0700;
Fax (04) 914 0770;
Email: survqueries@esr.cri.nz