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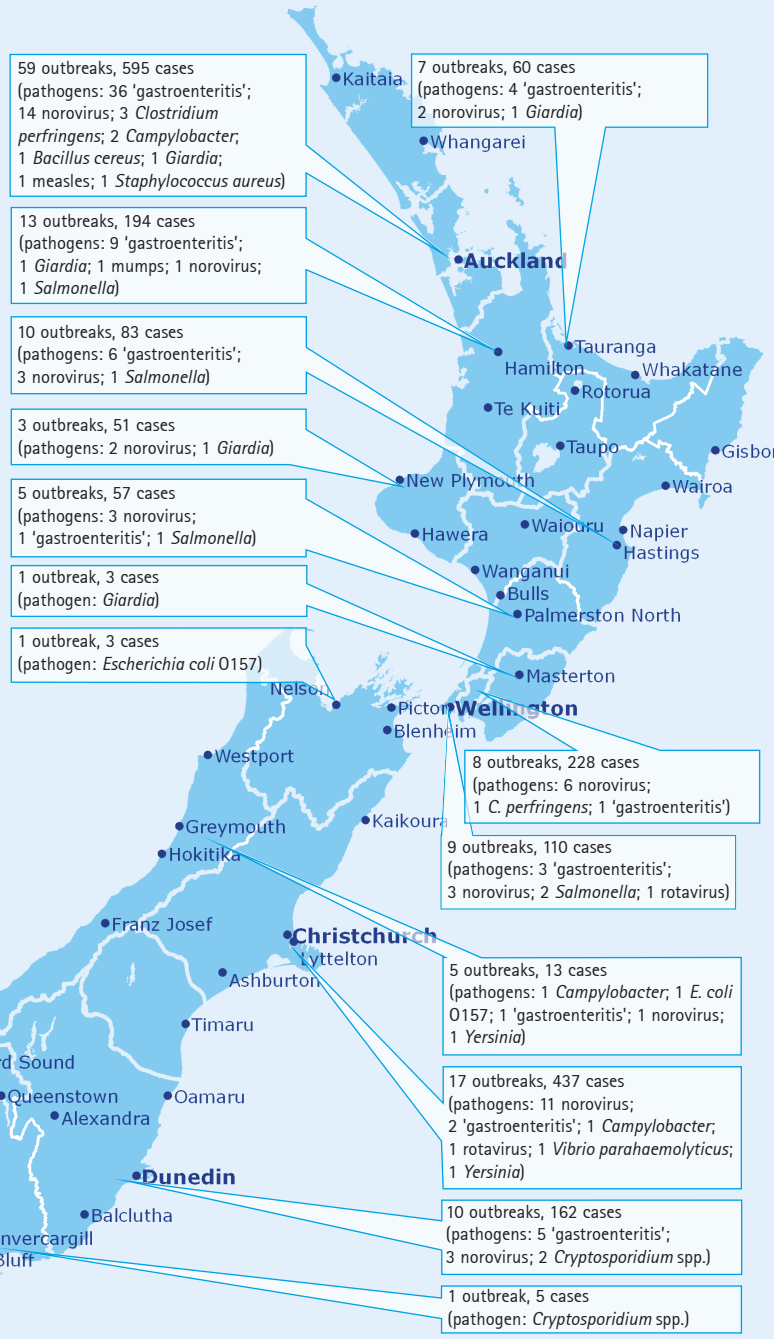
New Zealand Public Health Surveillance Report

March 2008: Covering October - December 2007

Contents & Highlights

This Quarter's Outbreaks

Notification and outbreak data in this issue are drawn from the October - December quarter of 2007. 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 16 January 2008.



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

1. Editorial

Typing of pathogenic isolates: an esoteric exercise or an intrinsic tool of epidemiology?

On a Friday afternoon the hospital laboratory identifies *Escherichia coli* O157 from three specimens referred by local doctors. Is there a connection?

Thus began one of the largest outbreaks of *E. coli* O157 infection ever seen. Apart from the organism, a similar scenario, including the Friday afternoon timing, will have been experienced by many public health laboratories in developed countries. Determining the relationship between cases of infectious diseases depends on a number of factors, but most importantly it requires knowledge of the local epidemiology of the disease and its causative agent.

In the scenario described above, it was the unprecedented number of *E. coli* O157 isolates in the local area that signalled the start of the outbreak. But, if there is no such obvious signal, how can we recognise an outbreak? For example, an outbreak of a particular strain of an organism may not be obvious for a disease that is relatively common. In this and other scenarios, a more detailed picture of the organism is required.

Microbiologists have been fascinated at the variation both within and between different bacterial species almost since microbes were first described. More recently the identification of a new pathogen such as Legionella or Helicobacter is rapidly followed by the identification of species and then strains within species. Distinguishing among strains, known as typing and sub-typing, arose from the need to identify those causing serious illness from more benign strains. Originally phenotypic methods were developed and for some pathogens these have proved robust and are still widely used. For other pathogens, however, a sizable proportion of the isolates were untypable. Recently, genotypic methods have been developed which can distinguish numerous different strains. The genotypic methods have given us an unprecedented ability to differentiate between individual isolates. This wealth of information provided by typing and sub-typing, however, needs to be placed in context. What is the purpose of the typing method, what is the question being asked? For many, the advent of yet another typing method means trying to understand the new nomenclature, determining the relationship between the new and previous methods, ensuring the same method is used internationally, and most importantly ensuring the information provided by the new method answers the question being posed. In this regard new typing methods maybe seen as esoteric as previous methods appeared adequate. But for the microbiologist they provide important information on the pathogen. The newly developed typing methods, such as multilocus sequence typing (MLST), can give insights into population structures and the relationship between pathogenic and non-pathogenic strains. Others, such as multi locus VNTR analysis (MLVA), are rapid and highly discriminatory. These methods can generate answers to seemingly impossible questions such as to what extent is poultry responsible for cases of campylobacteriosis. The insights provided by typing and sub-typing give us a better understanding of the pathogen and may provide suitable targets for intervention as seen with the introduction of the New Zealand specific meningococcal vaccine.

In a simple food-borne outbreak it is important that the source of the infection and those involved are identified. Do typing and sub-typing methods help? In this situation simply identifying the organism is often enough. Further characterisation does not help the investigation as it merely confirms what is already known. Associations between source and patient can be made and appropriate interventions implemented. For other situations, such as meningococcal, MRSA, and ESBL outbreaks, it is vitally important that the strain be identified. Distinguishing the outbreak strain allows the situation to be monitored effectively and any eradication procedures implemented to be adequately assessed. In widely dispersed outbreak situations, often it is only by performing typing and sub-typing that the outbreak is identified. An excellent example of this is PulseNet USA, an integrated real-time typing database that monitors pathogens such as *E. coli* O157 across different states of the USA.

For the epidemiologist and microbiologist, however, there are other questions to be answered: has this strain been responsible for other outbreaks; how common is the strain; is the disease associated with this strain more severe; has the strain been seen overseas; what is the relationship between different outbreak strains. Simply identifying the organism cannot answer these questions. For all situations, however, the typing method used needs to be matched with the information required. The development of novel methods can add significantly to our understanding of the evolution and spread of pathogenic organisms. Typing and sub-typing are now essential tools for studying the microbiology and epidemiology of pathogen populations.

Phil Carter, Communicable Disease Programme, ESR

2. Notifiable Disease Surveillance

The following is a summary of disease notifications for the October – December quarter of 2007 and cumulative notifications and rates calculated for a 12-month period (January 2007 – December 2007). 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 16 January 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

Mumps

- *Notifications*: 25 notifications in the quarter (2006, 19); 76 notifications over the last 12 months (2006, 47) giving a rate of 1.8 cases per 100,000 population (2006, 1.1); a statistically significant increase

Pertussis

- *Notifications:* 72 notifications in the quarter (2006, 159); 334 notifications over the last 12 months (2006, 1,120) giving a rate of 7.9 cases per 100,000 population (2006, 26.8); a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (159 cases)

INFECTIOUS RESPIRATORY DISEASES

Acute Rheumatic Fever

- *Notifications:* 12 notifications in the quarter (2006, 18); 140 notifications over the last 12 months (2006, 107) giving a rate of 3.3 cases per 100,000 population (2006, 2.6); a statistically significant increase
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (97 cases). Cases were distributed by age as follows: 3 (5-9 years), 6 (10-14 years), and 3 (15-19 years). All 12 cases were initial attacks of rheumatic fever

Meningococcal Disease

- *Notifications:* 26 notifications in the quarter (2006, 40); 107 notifications over the last 12 months (2006, 160) giving a rate of 2.5 cases per 100,000 population (2006, 3.8); a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (44 cases). Cases were distributed by age as follows: 4 (under 1 year) , 2 (1-4 years), 4 (5-9 years), 2 (10-14 years), 3 (15-19 years), and 11 (over 19 years); 8 cases were the epidemic strain

Tuberculosis Disease

- *Notifications:* 80 notifications in the quarter (2006, 91); 296 notifications over the last 12 months (2006, 354) giving a rate of 7.0 cases per 100,000 population (2006, 8.5); a statistically significant decrease
- *Comments:* 73 new cases and 7 reactivated cases; 55 laboratory confirmed cases, 9 probable cases, and 16 cases under investigation

ENTERIC INFECTIONS

Campylobacteriosis

- *Notifications:* 3,055 notifications in the quarter (2006, 4,398); 12,779 notifications over the last 12 months (2006, 15,873) giving a rate of 302.2 cases per 100,000 population (2006, 379.3); a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (2,660 cases) and a statistically significant quarterly decrease from the same quarter last year (4,398 cases)

Gastroenteritis

- *Notifications:* 172 notifications in the quarter (2006, 172); 614 notifications over the last 12 months (2006, 937) giving a rate of 14.5 cases per 100,000 population (2006, 22.4); 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

Paratyphoid Fever

- *Notifications:* 9 notifications in the quarter (2006, 9); 23 notifications over the last 12 months (2006, 23) giving a rate of 0.5 cases per 100,000 population (2006, 0.5); no change
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (2 cases)

Salmonellosis

- *Notifications:* 351 notifications in the quarter (2006, 305); 1,276 notifications over the last 12 months (2006, 1,335) giving a rate of 30.2 cases per 100,000 population (2006, 31.9); not a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (234 cases)

Shigellosis

- *Notifications:* 20 notifications in the quarter (2006, 22); 126 notifications over the last 12 months (2006, 102) giving a rate of 3.0 cases per 100,000 population (2006, 2.4); not a statistically significant increase
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (39 cases)

Typhoid

- *Notifications*: 6 notifications in the quarter (2006, 22); 48 notifications over the last 12 months (2006, 42) giving a rate of 1.1 cases per 100,000 population (2006, 1.0); not a statistically significant increase
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (22 cases)

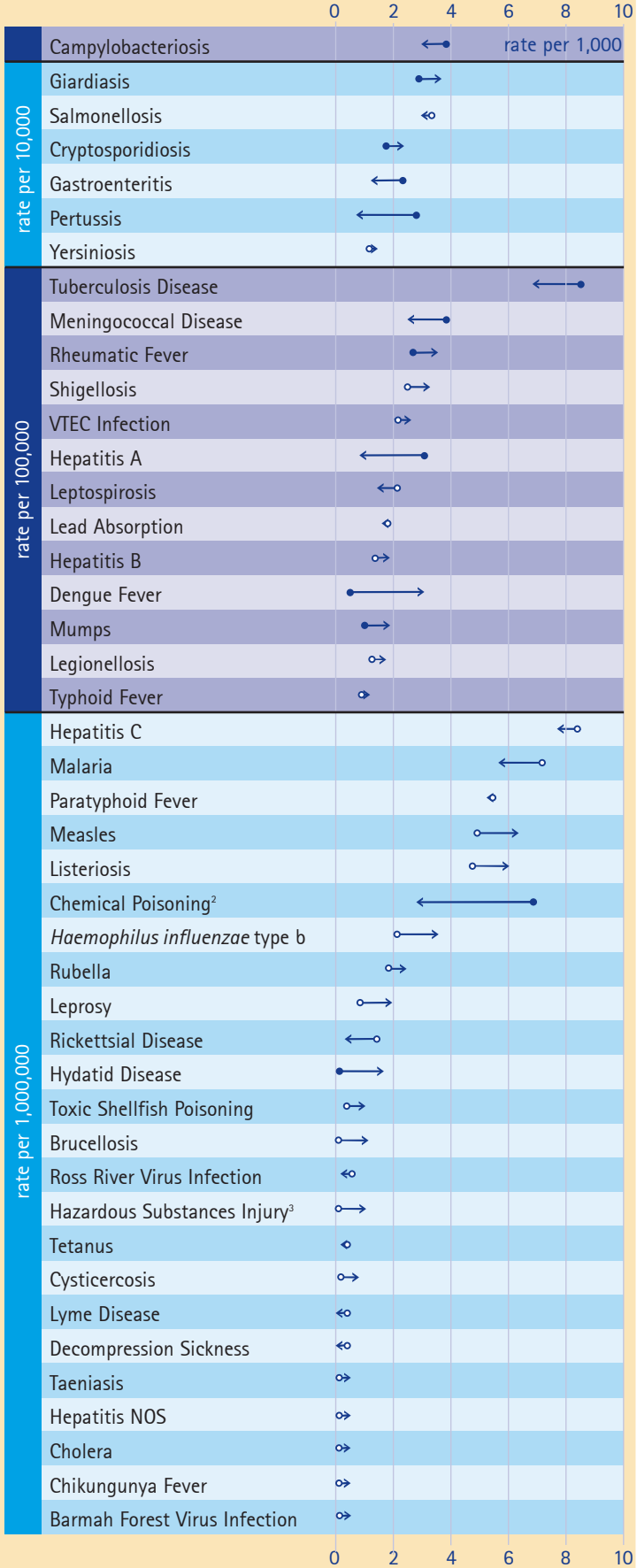
ENVIRONMENTAL EXPOSURES & INFECTIONS

Chemical Poisoning

- *Notifications:* no notifications in the quarter (2006, 24); 13 notifications over the last 12 months (2006, 28) giving a rate of 0.3 cases per 100,000 population (2006, 0.7); a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (8 cases) and from the same quarter last year (24 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 January - December 2007

[2] From the environment

[3] Hazardous Substances Injury became notifiable in EpiSurv as of 19 September 2007

Cryptosporidiosis

- *Notifications:* 273 notifications in the quarter (2006, 325); 925 notifications over the last 12 months (2006, 737) giving a rate of 21.9 cases per 100,000 population (2006, 17.6); a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (224 cases) and a statistically significant quarterly decrease from the same quarter last year (325 cases)

Giardiasis

- *Notifications:* 315 notifications in the quarter (2006, 277); 1,400 notifications over the last 12 months (2006, 1,214) giving a rate of 33.1 cases per 100,000 population (2006, 29.0); a statistically significant increase

Hepatitis A

- *Notifications:* 11 notifications in the quarter (2006, 12); 42 notifications over the last 12 months (2006, 123) giving a rate of 1.0 cases per 100,000 population (2006, 2.9); a statistically significant decrease
- *Comments:* cases were aged between 5 and 78 years, with 1 case 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:* 30 notifications in the quarter (2006, 14); 78 notifications over the last 12 months (2006, 78) giving a rate of 1.8 cases per 100,000 population (2006, 1.9); not a statistically significant decrease
- *Comments:* cases were distributed by age as follows: 3 (1-4 years), 2 (15-24 years), 12 (25-44 years), 10 (45-64 years), and 3 (over 65 years). 26 male cases, 4 female cases. 10 cases recorded an occupation that involved exposure to lead: painter (4 cases), and radiator fitter, fitter and turner, carpenter, labourer, artist and not specified (1 case each). Of the remaining 20 cases, 7 recorded hobbies involving exposure to lead: shooting (4 cases), and making ammunition, fishing and carpentry (1 case each); Only 18 of the 30 notifications would have been reported under the previous blood lead level threshold

Legionellosis

- *Notifications:* 24 notifications in the quarter (2006, 13); 68 notifications over the last 12 months (2006, 52) giving a rate of 1.6 cases per 100,000 population (2006, 1.2); not a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (7 cases)

Leptospirosis

- *Notifications:* 17 notifications in the quarter (2006, 15); 72 notifications over the last 12 months (2006, 88) giving a rate of 1.7 cases per 100,000 population (2006, 2.1); not a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (7 cases). 15 male cases, 2 female cases; 5 meat process workers, 4 dairy cattle farmers/workers, 2 slaughterers, 2 horticultural farmers/workers, 1 butcher or smallgoods maker, and for 3 cases the occupation was not stated

NEW, EXOTIC & IMPORTED INFECTIONS

Dengue Fever

- *Notifications:* 15 notifications in the quarter (2006, 9); 116 notifications over the last 12 months (2006, 19) giving a rate of 2.7 cases per 100,000 population (2006, 0.5); a statistically significant increase
- *Comments:* 13 notifications were laboratory confirmed, 1 notification is waiting results and the laboratory status of 1 case is unknown; all cases were overseas during the incubation period. Places visited were India (2), Hong Kong (1), Thailand (1), Vietnam (1), Singapore (2), Indonesia (2), Papua New Guinea (2), Australia (1), French Polynesia (1), and Tonga (4)

Hydatid Disease

- *Notifications:* 3 notifications in the quarter (2006, 0); 6 notifications over the last 12 months (2006, 0) giving a rate of 0.1 cases per 100,000 population (2006, 0.0); a statistically significant increase
- *Comments:* all cases were either migrants from farming backgrounds or had farm/meatwork exposure in New Zealand dating back decades

3. Other Surveillance Reports

Antimicrobial resistance among *Neisseria gonorrhoeae*

ESR collects *N. gonorrhoeae* antimicrobial susceptibility data quarterly from the community and hospital laboratories throughout New Zealand that do the majority of the sexual health clinic and general practice gonococcal diagnostic work. The data are derived from the results of the laboratories' routine antimicrobial susceptibility testing. Regular reports on this surveillance are available on the ESR surveillance website at www.surv.esr.cri.nz/antimicrobial/neisseria_gonorrhoeae.php.

During the latest 12-month period for which data are available, October 2006 to September 2007, the national rate of ciprofloxacin resistance was 19.1% and the rate of penicillin resistance was 5.5%. All isolates tested were susceptible to ceftriaxone. Ciprofloxacin resistance was more prevalent than penicillin resistance in all areas of New Zealand participating in this surveillance except the West Coast and Southland District Health Boards, which both reported a very low number of gonorrhoea cases and no resistance to either antibiotic (Table 1).

Table 1. Ciprofloxacin and penicillin resistance among *Neisseria gonorrhoeae*, October 2006 to September 2007

	Percent resistance (number tested)			
District Health Board[1,2]	Ciprofloxacin		Penicillin	
Northland	7.4	(27)	3.7	(27)
Auckland[3]	11.2	(1,108)	9.2	(1,110)
Waikato	26.3	(293)	1.5	(204)
Lakes	33.9	(130)	6.4	(109)
Bay of Plenty	37.7	(167)	1.2	(168)
Tairawhiti	21.1	(90)	5.7	(35)
Taranaki	13.9	(36)	0	(36)
Hawkes Bay	25.6	(219)	1.8	(220)
MidCentral	15.1	(119)	0.8	(119)
Capital and Coast/Hutt[4]	21.1	(228)	3.6	(224)
Nelson Marlborough	55.6	(18)	22.2	(18)
West Coast	0	(3)	0	(3)
Canterbury[5]	21.4	(337)	4.2	(337)
Otago	13.0	(54)	1.9	(54)
Southland	0	(28)	0	(28)
Total	19.1	(2,857)	5.5	(2,692)

1 The patient's place of residence, if known, was used to assign cases to a DHB, otherwise the location of the laboratory was used. For laboratories that do a lot of out-of-area work, place of residence data was available and used.
2 No data for Whanganui or Wairarapa District Health Boards.
3 The three Auckland District Health Boards (Waitemata, Auckland and Counties Manukau) are combined.
4 The two Wellington District Health Boards (Capital and Coast, and Hutt) are combined.
5 The two Canterbury District Health Boards (Canterbury and South Canterbury) are combined.

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 (October – December 2007). Comparisons are made to the previous quarter (July – September 2007), and to the same quarter in the previous year (October – December 2006). Note that the outbreak data in this section are notified to ESR by the Public Health Services.

General

- 149 outbreaks notified in this quarter (2001 cases)
- 99 are 'final' reports (1,541 cases); 50 are 'interim' reports (460 cases) that have yet to be finalised and closed

All following data pertain to final reports only.

- 15.6 cases on average per outbreak, compared with 13.8 cases per outbreak in the previous quarter (12.9 cases per outbreak in the same quarter of last year)
- 23 hospitalisations: norovirus (14 cases), gastroenteritis (6), *Salmonella* (2), and *Escherichia coli* O157 (1)
- 2 deaths: norovirus

Pathogens

- 40 norovirus outbreaks (1,074 cases) during this quarter
- 34 'gastroenteritis' outbreaks (282 cases)
- 5 *Giardia* outbreaks (23 cases)
- 4 *Campylobacter* outbreaks (14 cases)
- 3 *Clostridium perfringens* outbreaks (8 cases)
- 3 *Cryptosporidium* spp. outbreaks (24 cases)
- 3 *Salmonella* outbreaks (31 cases)
- 2 rotavirus outbreaks (21 cases)
- 2 *Yersinia* outbreaks (9 cases)
- 1 *Bacillus cereus* outbreak (51 cases)
- 1 *Escherichia coli* O157 outbreak (2 cases)
- 1 *Staphylococcus aureus* outbreak (2 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.

- 72 person-to-person, from (non-sexual) contact with an infected person (including droplets): 38 norovirus (1070 cases), 22 gastroenteritis (215 cases), 3 *Cryptosporidium* spp. (24 cases), 3 *Giardia* (9 cases), 2 *Campylobacter* (9 cases), 2 rotavirus (21 cases), 1 *E. coli* O157 (2 cases), and 1 *Yersinia* (2 cases)
- 15 foodborne, from consumption of contaminated food or drink (excluding water): 4 gastroenteritis (11 cases), 3 *Salmonella* (31 cases), 2 *C. perfringens* (4 cases), 1 *B. cereus* (51 cases), 1 *Campylobacter* (7 cases), 1 *Cryptosporidium* spp. (6 cases), 1 norovirus (5 cases), 1 *S. aureus* (2 cases), and 1 *Yersinia* (7 cases)
- 12 environmental, from contact with an environmental source (e.g. swimming): 6 gastroenteritis (70 cases), 4 norovirus (110 cases), and 2 *Cryptosporidium* spp. (11 cases)
- 6 waterborne, from consumption of contaminated drinking water: 4 *Giardia* (20 cases), 1 *Campylobacter* (2 cases), and 1 *Cryptosporidium* spp. (5 cases)
- 5 zoonotic: 3 *Cryptosporidium* spp. (24 cases), 1 *Campylobacter* (2 cases), and 1 *Yersinia* (2 cases)
- 6 other mode of transmission: 4 norovirus (via fomites) (188 cases), 1 gastroenteritis (via fomites) (10 cases), and 1 rotavirus (via fomites) (8 cases)
- 16 mode of transmission unknown: 11 gastroenteritis (64 cases), 2 *Campylobacter* (5 cases), 2 norovirus (4 cases), and 1 *C. perfringens* (4 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.

- 36 rest home: 24 norovirus (855 cases), 9 gastroenteritis (107 cases), 2 rotavirus (21 cases), and 1 *Campylobacter* (3 cases)
- 19 home: 5 *Giardia* (23 cases), 4 norovirus (26 cases), 3 gastroenteritis (9 cases), 2 *Cryptosporidium* spp. (19 cases), 1 *Campylobacter* (2 cases), 1 *C. perfringens* (2 cases), 1 *E. coli* O157 (2 cases), 1 *Salmonella* (11 cases), and 1 *Yersinia* (2 cases)
- 12 hospital (continuing care): 9 norovirus (366 cases), and 3 gastroenteritis (57 cases)
- 8 café: 4 gastroenteritis (10 cases), 3 norovirus (36 cases), and 1 *Campylobacter* (7 cases)
- 8 takeaways: 2 *C. perfringens* (4 cases), 2 gastroenteritis (5 cases), 2 *Salmonella* (20 cases), 1 norovirus (2 cases), and 1 *S. aureus* (2 cases)
- 6 childcare: 5 gastroenteritis (66 cases), and 1 norovirus (29 cases)
- 6 farm: 2 *Cryptosporidium* spp. (19 cases), 2 *Giardia* (6 cases), 1 *Campylobacter* (2 cases), and 1 *Yersinia* (2 cases)
- 5 hospital (acute care): 4 norovirus (73 cases), and 1 gastroenteritis (4 cases)
- 1 community: *B. cereus* (51 cases)
- 1 caterers: *B. cereus* (51 cases)
- 1 hotel/motel: gastroenteritis (2 cases)
- 1 other food outlet: *Yersinia* (7 cases)
- 7 'other setting': 3 norovirus (29 cases), 2 *Cryptosporidium* spp. (18 cases), 1 gastroenteritis (12 cases), and 1 *Yersinia* (7 cases)
- 10 outbreaks with no setting selected: 7 gastroenteritis (17 cases), 1 *Campylobacter* (2 cases), 1 *C. perfringens* (4 cases), and 1 norovirus (2 cases)

5. Outbreak Case Reports

A dual pathogen outbreak of rotavirus and norovirus at a childcare centre

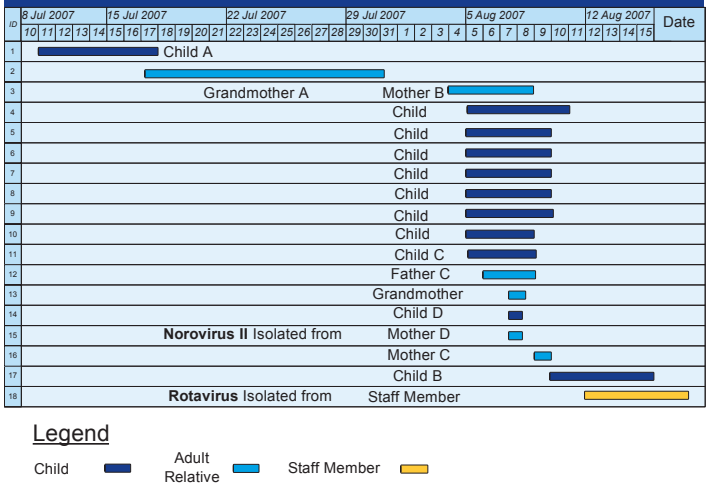
On 8 August 2007, the Auckland Regional Public Health Service (ARPHS) was alerted to a gastroenteritis outbreak at a 16-child Childcare Centre (the Centre) in Auckland. Eight of the children began to experience symptoms of diarrhoea and vomiting (D&V) on 5 August. As the week progressed more children and associated adults became unwell.

A case was defined as any person, who had contact with the Centre, its attendants or staff, who suffered from D and/or V from 1 July to 13 August 2007. Eighteen children, adult relatives and staff satisfied the case definition.

Norovirus infection was initially suspected. A site visit was conducted the day after the outbreak was reported with the premises stating good hand hygiene and cleaning practices, using appropriate disinfectants followed by hypochlorite solution. A staff sickness policy was in place along with exclusion of children ill with D&V (for 24 hours after becoming symptom free). Several children experienced diarrhoea while at the Centre with some having ongoing symptoms after returning there following the exclusion period. This prompted ARPHS to advise the exclusion period be extended to 48 hours. The Centre's cook did not report illness.

The predominant symptoms reported were diarrhoea (94%), vomiting (89%), lethargy (89%) and fever (72%). No cases were hospitalised. The duration of illness (Figure 1) ranged from one day (4 cases) to 14 days (1 case). The majority of cases had symptoms for three to seven days (13 cases). The median duration of illness amongst children (11 cases) and adults (7 cases) was five and three days respectively.

Figure 1. Illness onset and duration amongst cases



Of the five initial faecal specimens provided, four were negative for norovirus, campylobacter, salmonella, giardia, cryptosporidium, and adenovirus (adenovirus analysis was requested as two children had conjunctivitis). Rotavirus was requested but was unable to be performed on these samples as the laboratory was unable to process samples more than 24 hours old for rotavirus. However, an additional (sixth) sample taken on 20 August tested positive for rotavirus. On 22 August ARPHS was informed that the final faecal sample out of the five initially taken (from a mother who was a case) tested positive for norovirus Genogroup II. Hence two different pathogenic organisms were isolated, indicating a dual organism outbreak.

There were two clusters of illness duration, the first at one day duration and the second at five days duration. Given the short duration of illness in four of the cases (one day) it is likely that these cases had norovirus while those with longer durations (3-14 days) had rotavirus.

Rotavirus infections are the single most common cause of severe diarrhoea in children under two years of age.[1] The peak incidence for which is between six months and two years of age,[2] which matches exactly with the ages of children in the Centre. Six adults became unwell in this outbreak (four with durations of illness equal to or greater than three days, of which rotavirus was isolated from one). Rotavirus is transmitted via the faecal-oral route and person-to-person spread through contaminated hands is the most likely transmission route in this outbreak. Reports of illness amongst adults due to rotavirus infection are rare.[1,2] The high infectivity of norovirus, routes of transmission and the short duration of illness are well known.[2,3] Both viruses present a challenge to infection control in day-care settings.

In summary, i) multiple pathogens can be involved in a single childcare centre outbreak demonstrating the benefits of stool sampling of cases; and ii) testing for rotavirus should be considered in gastroenteritis outbreaks involving adults if the illness duration is ≥3 days.

1 Immunisation Advisory Centre 2007. *Health Professionals: Online Resource Centre. Rotavirus.* At www.immune.org.nz/?T=927#rv1. University of Auckland, Auckland.

2 Hawker J 2005. *Communicable Disease Control Handbook.* Blackwell Publishing, Oxford.

3 *Guidelines for the management of Norovirus outbreaks in hospitals and elderly care institutions. 2007.* At www.arphs.govt.nz/notifiable/downloads/Norovirus_Guidelines_2007.pdf.

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

Outbreak of rare *Salmonella* Montevideo associated with a kebab takeaway stall

Salmonella Montevideo is a rare human pathogen in New Zealand. The Enteric Reference Laboratory at the Institute of Environmental Science and Research (ESR) usually identifies about eight isolates per year. On 15 October 2007, ESR alerted Regional Public Health (RPH) that three isolates of *Salmonella* Montevideo had been identified from notified cases in the region in the last week. This prompted enhanced case investigations.

Completed salmonellosis case report forms were reviewed and cases re-interviewed. Additional case finding was done through regional laboratories that provided details on *Salmonella* isolates from cases that were not yet notified. In total there were seven laboratory-confirmed cases of *S.* Montevideo and three probable cases, with onsets of illness between 3 and 7 October 2007.

All 10 cases had eaten at the same takeaway kebab stall between 1 and 4 October 2007. The cases reported eating chicken kebabs (7 cases), vegetarian falafel kebabs (2 cases), and a lamb kebab (1 case). Eating food from these premises was the only commonality amongst these cases.

Foods sold included chicken, lamb, and falafel kebabs, burgers or other meal options. Meal options came with rice, mixed salad, hummus, and a choice of three sauces. The kebabs and burgers came with lettuce, tomato, onion, tabouli, hummus, and a choice of three sauces. All sauces were bought in as ready to use, but hummus and yoghurt were made on site.

Six potential hazards were identified at the premises. The most significant related to potential cross-contamination between raw chicken and salads, potential cross-contamination via inadequately cleaned multi-use cloths, lack of a cleaning schedule for the kitchen, and no sanitising agent being used on food preparation surfaces.

Due to the potential ongoing nature of the outbreak, and the unknown cause of the outbreak, the premises were considered to pose an unacceptable risk to public health. They were closed with a notice of *Prohibition of Sale of Food From Premises Regulation 12, Food (Safety) Regulations 2002*, on the basis that it was suspected that food being sold was contaminated with an organism which is capable of causing food poisoning and/or is a communicable disease within the definition of the Health Act 1956. The owner was also served with a letter listing six necessary requirements for revoking the prohibition of sale notice. In terms of *Salmonella* control the most important were: (1) All staff were to remain off work until they had produced one faecal specimen negative for *Salmonella*, (2) The premises were to be thoroughly cleaned using an appropriate sanitising and cleaning agent, (3) All ready-to-eat foods that would not be subject to further heat treatment (cooking), were to be destroyed.

Imported tahini paste and yoghurt made at the premises were sampled aseptically and tested at ESR's Public Health Laboratory. Both were found to be free of *Salmonella*.

On 24 October 2007, the premises were inspected with regard to revoking the prohibition order. The owner and six staff had produced faecal specimens that tested negative for *Salmonella*. However, one staff member refused to produce a specimen. The premises, including all important food preparation surfaces, had been thoroughly cleaned with a sanitising agent and bleach to remove potential environmental *Salmonella* and a cleaning schedule had been implemented. Ready-to-eat foods and raw chicken were disposed of under RPH supervision (including all opened sauces, cooked skewered meat, lettuces in recycled fertiliser bags, tahini, yoghurt, frozen hummus, and parsley). The prohibition of sales notice was revoked.

The source of the *S.* Montevideo remains unknown. However, there are several possibilities:

- An infected food handler with poor hand hygiene contaminating food,
- Cross-contamination, for example, between raw chicken in the defrosting sink and salad in the washing sink, from inadequately cleaned and sanitised food preparation surfaces or from inadequately sanitised multi-use cloths,
- A contaminated ingredient.

The strongest possibility is that an infected symptomatic or asymptomatic food handler contaminated the food eaten by cases. One food handler produced a very late faecal specimen and could have been no longer shedding, and another refused to give a specimen as they had decided not to continue with employment. Both were known to be ill (with at least vomiting reported to the owner) during the period the cases visited the premises. Both handled, rolled, and wrapped the finished kebabs and falafels.

These reported cases are probably a small part of the total number of people infected, as not all people seek medical attention for enteric illness, and provide diagnostic specimens.

Reported by Quentin Ruscoe, Health Protection Officer, Regional Public Health, Hutt Valley District Health Board

Probable *Bacillus cereus* enterotoxin associated diarrhoeal syndrome outbreak in Auckland

On 9 October 2007, the Auckland Regional Public Health Service was notified of an outbreak of gastroenteritis affecting patrons of a prize-giving function at an events centre in North Auckland that took place three days earlier on 6 October. Symptoms of those interviewed included diarrhoea and stomach cramps. Approximately 750 people attended the event with visitors from as far away as Australia and South Africa.

An outbreak investigation was commenced and included case finding, a retrospective cohort analysis, microbiological and environmental investigations. A standardised questionnaire concerning food and drink consumption was administered by telephone. Foods consumed at the event included *daal* (lentil soup), lamb biryani, vegetarian biryani, salad, cheese and crackers, ice cream and a selection of alcoholic beverages. Faecal specimens were requested from 18 symptomatic attendees. A site investigation was conducted and HACCP-based food safety assessment performed.

Of the 134 patrons interviewed, 54 reported feeling ill, with 51 satisfying the case definition (at least 2 loose bowel motions in a 24 hour period, and no illness prior to the implicated meal). The median incubation period was 12 hours 30 minutes. The most frequently reported symptoms were diarrhoea, abdominal cramps, nausea, fever and headache consistent with enterotoxin associated diarrhoeal syndrome. The epidemic curve was classical for a point source exposure at a common event. Statistical analysis indicated individuals who consumed *daal* were significantly more likely to be cases (relative risk 2.43, 95% confidence interval 1.07 to 5.54) than those who did not.

Microbiological testing was limited to the stools of two ill patrons, culture following simulated time and temperature abuse of split pea lentils and routine culture of some ingredient spices. Enterotoxin associated diarrhoea caused by either *Bacillus cereus* or *Clostridium perfringens* were most likely causes of the outbreak in view of the symptoms reported by patrons. Two stool specimens showed evidence of *C. perfringens* (concentration of organism 1.4 x 10^6 and 1.0 x 10^4 CFU/g), and one stool specimen yielded low concentrations of *B. cereus* (<1.0 x 10^4). Although the isolation of >10^6 CFU/g of *C. perfringens* satisfies the diagnostic criteria for this disease in an outbreak scenario,[1] the retrospective cohort analysis implicated a vegetarian dish (*daal*). The low concentration of *B. cereus* in the stool of one patron is suggestive, but not confirmatory evidence of this pathogen causing the illness (10% of humans are colonised with this species[2]). Simulated cooking and time and temperature abuse of the split pea lentils, mimicking the implicated batch of *daal*, did not detect significant bacterial contamination. Low levels of *B. cereus* (2.0 x 10^2 CFU/g) were found in routine tests of the turmeric powder, however 10^4 CFU/g is the limit above which a food is considered unsafe for consumption.[3] No *C. perfringens* was isolated from the herb samples.

A likely explanation for the outbreak was that the relatively low concentrations of *B. cereus* present in the turmeric powder seeded the *daal* with time and temperature abuse causing bacterial overgrowth and toxin elaboration in the final product. The median incubation period (12 hours) is consistent with *B. cereus* intoxication but illness due to *C. perfringens* cannot be excluded.

The investigation was limited by reliance on a telephone administered questionnaire, and the low compliance with requests for faecal specimens (two of 18 requested specimens were received), and the time between notification of the outbreak and initiation of the study, increasing the likelihood of participant recall bias.

The caterer was not registered under the *Food Hygiene Regulations (1974)* with the Territorial Local Authority, and food was prepared in a residential garage. The site investigation and HACCP-based food safety assessment revealed multiple critical control point failures. Failures most likely to have resulted in this outbreak included slow cooling of *daal* in two large storage containers after cooking, and inadequate reheating of the *daal* prior to consumption, (both *C. perfringens* and *B. cereus* enterotoxins are heat labile). The caterer was served with a notice to close the catering premises, pending registration with the Territorial Local Authority under the *Food Hygiene Regulations (1974)*.

This outbreak highlights an unusual cause of foodborne illness: *B. cereus* enterotoxin associated diarrhoeal syndrome. All aspects of the investigation: the environmental assessment, epidemiological analysis, clinical symptoms and the microbiological testing support this implicated pathogen. *B. cereus* is commonly associated with starchy foods such as fried rice served by Chinese restaurants (Chinese rice syndrome). This outbreak highlights how seeding may occur from contaminated herbs in a lentil-based dish, following significant time and temperature abuse of the cooked food. The importance of microbiological sampling of all ingredients of such an implicated dish, when fresh product is unavailable, is underscored.

1 Hauschild WAH 1975. Criteria and procedures for implicating *Clostridium perfringens* in food-borne outbreaks. *Can J Public Health* 66: 388-92.

2 Bibek R 2004. *Fundamental Food Microbiology.* 3rd ed. CRC press, Boca Raton.

3 Granum PE 1997. *Bacillus cereus.* In: *Food Microbiology: fundamentals and frontiers*, (Eds) Doyle MP, Beuchat LR, and Montville TD. pp 327-336. ASM Press, Washington D.C., USA.

Reported by Simon Thornley, Public Health Medicine Registrar, Greg Simmons, Medical Officer of Health, Shikha David, Health Protection Officer, and Jackie Rapana, Technical Officer, Auckland Regional Public Health Service

6. Pathogen Surveillance

Unless otherwise reported, pathogen surveillance covers the October - December 2007 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

- 336 human and 248 non-human isolates were submitted to ERL (2006, 311 and 250 respectively)
- 7 cases *S.* Montevideo, food premise in Porirua, cross contamination, poor food handling practices
- 25 cases *S.* Chester, 14 from Tauranga. A significant proportion of the remaining 11 cases have links to visiting Tauranga. Extensive investigation of this cluster is ongoing

VTEC/STEC (ERL)

- 20 isolates of O157 were laboratory confirmed (2006, 13)
- 3 family clusters, Blenheim (4 cases), Christchurch (3 cases), West Coast (2 cases)
- each family cluster gave a distinct PFGE profile
- remaining 11 cases were not related and PFGE demonstrated no common DNA profile is circulating in New Zealand

Shigella (ERL)

- 17 isolates submitted (2006, 22)
- no outbreaks reported

Norovirus (Norovirus Reference Laboratory)

- 91 confirmed norovirus outbreaks were reported from all regions of New Zealand, of which 38 occurred in October, 31 in November and 22 in December
- 61 outbreaks occurred in rest homes (67%), 12 occurred in hospitals (13%), and 3 in catered food settings including 1 at a national flower show
- 6 outbreaks were associated with childcare or camp settings including an outbreak at an international Scout jamboree over the New Year period. Effective public health procedures were successful in containing this outbreak to ~150 cases among 3,000 scouts
- genotyping showed that GII/4 strains continue to predominate, accounting for 66/74 (89%) outbreaks, including 56/73 (77%) outbreaks in healthcare settings
- the 2006b variant, first identified in 2006, continues to be the predominant GII/4 strain circulating

- other genotypes identified were GI/4, GI/8, GII/6 and GII/7. The GII/6 strains were associated with 5 outbreaks, including the scout jamboree and the flower show
- 2 distinct norovirus strains, GII/4 2006a and GII/6, were identified from a hospital outbreak

LEGIONELLOSIS AND ENVIRONMENTAL LEGIONELLA

- 25 laboratory-identified legionellosis cases reported this quarter compared with 6 last quarter
- no deaths associated with legionellosis were reported
- all but 2 of the lab-identified cases were notified to the PHU
- a further 17 notified cases were not laboratory-proven, 2 of which no clinical samples were received
- all lab-identified cases involved sporadic community acquired cases, with no outbreaks identified
- of the 25 cases identified, 21 fitted the confirmed case definition and 4 fitted the probable case definition
- the 21 confirmed cases demonstrated either antibody titres >512 on two or more occasions (6 cases), or at least a four-fold rise in antibody titre by the legionella IFAT (6 cases), or a rising titre to at least 1024 (3 cases), or stable titres >512 (6 cases)
- the 4 probable cases demonstrated a single antibody titre of >512
- *L. pneumophila* serogroup 1 was identified as the causative agent in 4 cases
- *L. pneumophila* serogroup 8 was identified as the causative agent in 2 cases
- *L. pneumophila* serogroup 12 was identified as the causative agent in 1 case
- *L. pneumophila* serogroup 15 was identified as the causative agent in 1 case
- *L. longbeachae* serogroup 1 was identified in 3 cases
- *L. longbeachae* serogroup 2 was identified in 5 cases
- in a further 4 *L. longbeachae* cases the serogroup was not identified
- 1 infection was caused by *L. micdadei*
- 1 infection was caused by *L. jordanis*
- in a further case elevated titres were identified to both *L. bozemanii* and *L. longbeachae* following exposure to compost from which both organisms were isolated - this may represent a dual infection
- *Legionellae* isolated from domestic drinking and recreational water systems included *L. pneumophila* serogroups 1 & 8
- *Legionellae* isolated from industrial water systems including cooling towers included *L. anisa*, *L. pneumophila* serogroups 1, 6 & 8, L. rubrilucens, and *L. santacrucis*
- *Legionellae* isolated from composts and soils included *L. anisa*, *L. bozemanii* and *L. longbeachae* serogroups 1 & 2

RESPIRATORY VIRUSES

Influenza Virus

- 59 influenza viruses were reported from sentinel and laboratory-based surveillance (2006, 1)
- 29 were identified as influenza A, 2 as A/New Caledonia/20/99 (H1N1)-like strains, 2 as A (H1N1) not-antigenically-subtyped, 9 as A/Wisconsin/67/2005 (H3N2)-like strains, 2 as A (H3N2) not-antigenically-subtyped, and 14 as A not-subtyped
- 30 were identified as influenza B, 28 as B/Shanghai/361/2002-like strains, 2 not subtyped

Respiratory Syncytial Virus, Rhinovirus and Parainfluenza Virus

- 75 cases of respiratory syncytial virus were reported (2006, 28)
- 10 rhinoviruses were reported (2006, 5)
- 45 parainfluenza viruses were reported (2006, 48), 44 were further typed as parainfluenza type 3, and 1 as parainfluenza type 1

ADENOVIRUSES AND ENTEROVIRUSES

Adenoviruses

- 176 adenoviruses were reported (2006, 97)
- adenovirus type 3 was the predominant serotype
- 162 adenoviruses were serotyped as adenovirus type 1 (27), type 2 (8), type 3 (79), type 4 (4), type 5 (2), type 6 (1), type 7 (4), type 8 (26), type 15 (1), type 37 (7) and untypable (3)

Enteroviruses

- 50 enteroviruses were reported (2006, 55)
- 28 enteroviruses were serotyped as Coxsackie B4 (1), Coxsackie A16 (1), Coxsackie A24 (1), Echovirus 3 (1), Echovirus 6 (7), Echovirus 7 (3), Echovirus 11 (8), Echovirus 27 (2), Echovirus 30 (1), Enterovirus 71 (2), and untypable (1)

SPECIAL BACTERIOLOGY

Listeria monocytogenes

- 11 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)
- 2 cases were perinatal, both infants survived
- 9 cases were in adults who were elderly and/or had underlying illness

Corynebacterium diphtheriae

- 2 isolates of *Corynebacterium diphtheriae* were received for toxigenicity testing, typing and surveillance purposes
- both isolates were var. *mitis* strains from cutaneous sources, patients were from Auckland and Wellington
- the isolates were determined to be non-toxigenic by PCR examination for the toxin gene

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