Volume 8 Issue 4 ISSN 1176-2888 (Print) ISSN 1178-8313 (Online)

New Zealand Public Health Surveillance Report

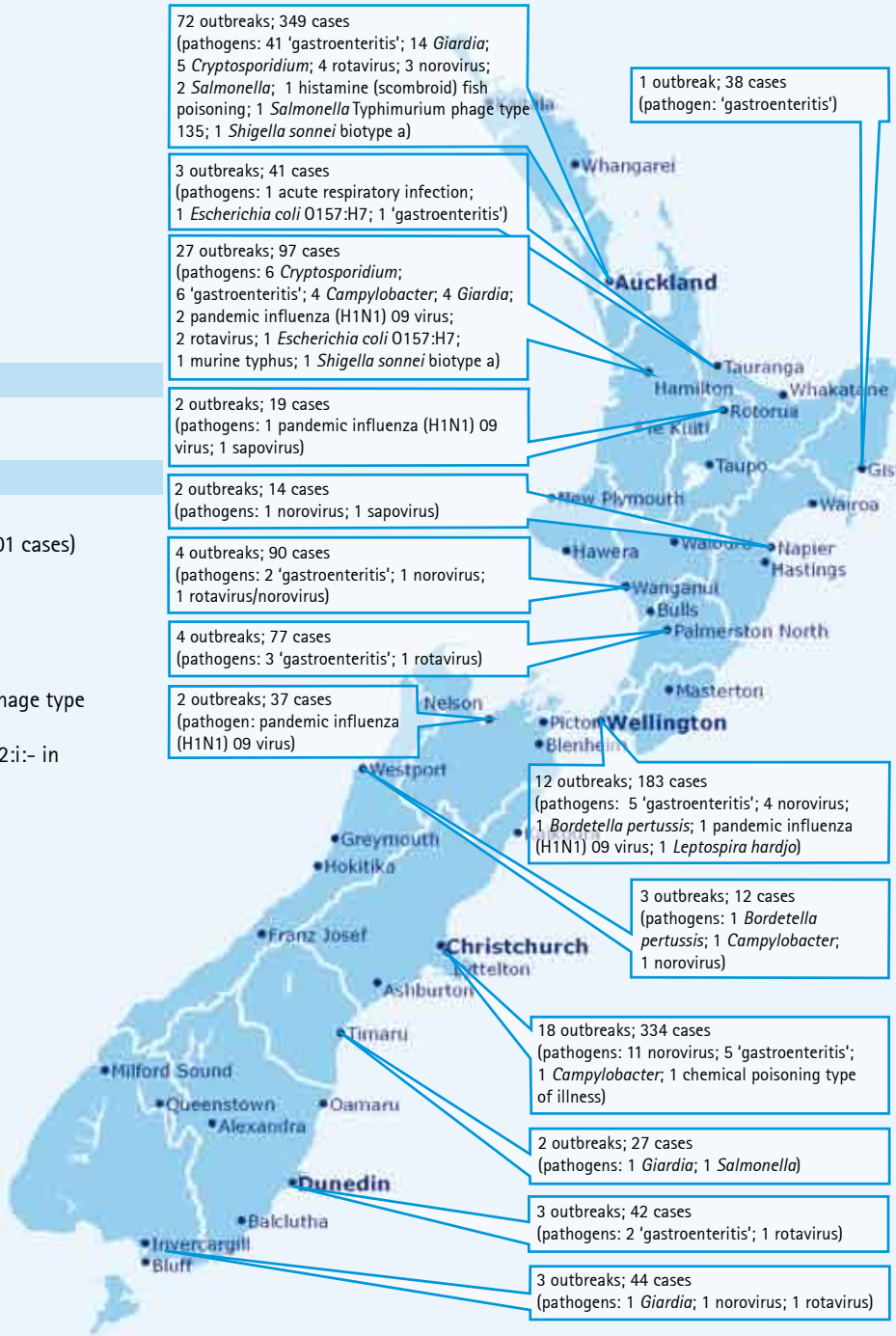
December 2010: Covering July to September 2010

Contents & Highlights

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

This Quarter's Outbreaks

Notification and outbreak data in this issue are drawn from the July to September quarter of 2010. 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 5 October 2010.



1. Editorial

The public health response to Canterbury's earthquake

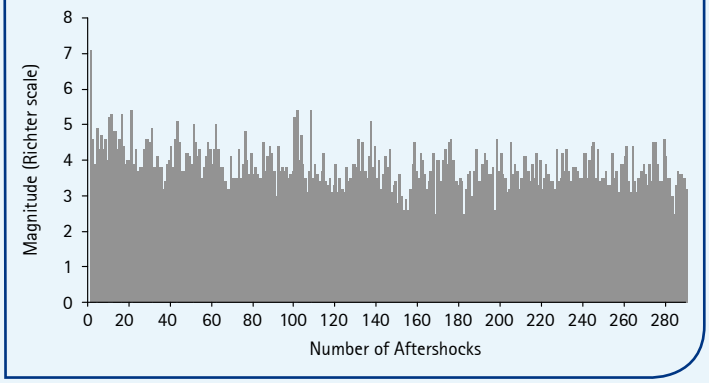
The magnitude 7.1 earthquake that hit Canterbury on 4 September 2010 caused widespread damage both above- and below- ground, with much of the damage centred on Christchurch.

Assessment of the public health implications

The public health implications of the Canterbury earthquake were potentially very serious because of damage to the underground drinking-water and wastewater infrastructure. This damage meant that drinking-water supplies, particularly those that were unchlorinated, which included Christchurch, were possibly contaminated due to sewage spills. Other waters also potentially contaminated by sewage included rivers and estuaries, and surface flooding that had been caused by liquefaction. Over 1000 homes were uninhabitable and displaced persons required accommodation. The number of injuries was relatively few and both Christchurch's Emergency Department and the hospital had capacity.

The community was disturbed by the number and severity of the aftershocks in the days that followed the main earthquake (Figure 1). There were reports of an escalation in stress in the community accompanied by an increase in family violence, numbers of heart attacks and general practice consultations for anxiety. Fortunately, 96% of general practices and 93% of pharmacies remained open, enabling people to receive care in their usual primary care environment.

Figure 1. Magnitude of 290 aftershocks 4–22 September 2010
Source: GeoNet



Public health response

The main public health actions were taken within 36 hours of the initial quake. 'Boil water' notices were issued for Christchurch and affected areas of the Waimakariri and Selwyn Districts, and schools were closed and remained closed for a week. The public were recommended to avoid recreational water use, to use temporary toilets and bury their waste on their properties if they were without water, and to connect with neighbours and support each other. Two documents were widely distributed, 'Key Public Health Messages' and 'Coping With a Disaster'. Health protection officers were involved in drinking-water testing, advising on drinking-water and sewerage problems, assisting with inspections of residential buildings and food premises, and visiting the welfare centres.

Welfare centres

Welfare centres were established for those left homeless by the earthquake and slept up to 260 people. Public health staff visited daily to assess people's health status and provide advice. Two families with gastroenteritis and a child with suspected chicken pox were the only cases of illness seen and these were managed without subsequent spread. All centres were able to be closed within 12 days of the earthquake.

Infectious disease surveillance

A gastroenteritis surveillance programme was set up at the end of the first week. This programme involved 31 sentinel general practices in the most affected areas plus the three main Christchurch after hours clinics. The daily gastroenteritis status was faxed from the practices, a surveillance method that had been effective previously. All other general practitioners (GPs) were asked to report any increase or outbreaks of gastroenteritis. No increase in gastroenteritis was reported over the following 9 days by the sentinel practices or generally throughout the affected areas up to the second week in October. After 9 days, intensive surveillance of gastroenteritis was discontinued, although GPs were requested to continue to report any suspected increases.

In the 19 days following the quake, the community showed no increase in five of the six major enteric diseases (campylobacteriosis, cryptosporidiosis, gastroenteritis, giardiasis, and yersiniosis). Although salmonellosis increased, there was no outbreak identified, 60% of cases lived in areas where the infrastructure was not affected and the increase was not thought to be related to the quake.

Influenza-like illness surveillance showed a sharp decrease in rates in Canterbury during that time – this was consistent with the national trend.

Recovery phase

Key public health issues for the recovery phase, which is expected to last at least 2 years, are ongoing sewage discharges to rivers, several hundred houses without sewerage, restoring buildings and infrastructure, and community recovery.

Reported by Peter Mitchell, Medical Officer and Daniel Williams, Medical Officer of Health, Community & Public Health, Canterbury District Health Board.

2. Notifiable Disease Surveillance

The following is a summary of disease notifications for the July to September quarter of 2010 and cumulative notifications and rates calculated for a 12-month period (October 2009 to September 2010). 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 RG and Altman DG 2000. Proportions and their differences. In: *Statistics with Confidence*. BMJ Books, Bristol.]. Data contained within this report are based on information recorded in EpiSurv by public health service staff up to 5 October 2010. As this information may be updated over time, these data should be regarded as provisional.

National surveillance data tables are available at www.surv.esr.cri.nz.

VACCINE PREVENTABLE DISEASE

Invasive Pneumococcal Disease

- *Notifications:* 218 notifications in the quarter (2009, 254); 599 notifications over the last 12 months, giving a rate of 13.9 cases per 100,000 population.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (148 cases); cases were aged between 3 months and 101 years, with 17 cases under the age of 2 years.
- *Note:* Invasive pneumococcal disease became notifiable on 17 October 2008, therefore comparisons between 12-month rates are not valid.

Measles

- *Notifications:* 10 notifications in the quarter (2009, 194); 63 notifications over the last 12 months (2009, 237), giving a rate of 1.5 cases per 100,000 population (2009, 5.5), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (194 cases); 5 cases were laboratory confirmed.

Meningococcal Disease

- *Notifications:* 29 notifications in the quarter (2009, 62); 104 notifications over the last 12 months (2009, 136), giving a rate of 2.4 cases per 100,000 population (2009, 3.2), a statistically significant decrease.

- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (62 cases); cases were distributed by age as follows: 5 (<1 year), 7 (1–4 years), 3 (5–9 years), 2 (10–14 years) and 12 (15 years and over); 4 cases were the epidemic strain.

Pertussis

- *Notifications:* 215 notifications in the quarter (2009, 340); 1092 notifications over the last 12 months (2009, 1174), giving a rate of 25.3 cases per 100,000 population (2009, 27.2), not a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (340 cases).

INFECTIOUS RESPIRATORY DISEASES

Non-seasonal Influenza (pandemic influenza (H1N1) 09)

- *Notifications:* 1767 notifications in the quarter (2009, 2422); 1854 notifications over the last 12 months, giving a rate of 43.0 cases per 100,000 population.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (39 cases) and a statistically significant quarterly decrease from the same quarter last year (2422 cases); cases were distributed by age as follows: 83 (<1 year), 159 (1–4 years), 291 (5–14 years), 321 (15–24 years), 573 (25–44 years), 300 (45–64 years), 39 (65 years and over), 1 (age unknown); 1722 cases were laboratory confirmed.
- *Note:* non-seasonal influenza became notifiable on 29 April 2009, therefore comparisons between 12-month rates are not valid.

ENTERIC INFECTIONS

Campylobacteriosis

- *Notifications:* 1737 notifications in the quarter (2009, 1551); 7757 notifications over the last 12 months (2009, 7037), giving a rate of 179.7 cases per 100,000 population (2009, 163.1), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (1412 cases) and from the same quarter last year (1551 cases).

Gastroenteritis

- *Notifications:* 127 notifications in the quarter (2009, 251); 516 notifications over the last 12 months (2009, 796), giving a rate of 12.0 cases per 100,000 population (2009, 18.4), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (251 cases).
- *Note:* this is not a notifiable disease per se except in persons with a suspected common source or with a high risk occupation. 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.

Salmonellosis

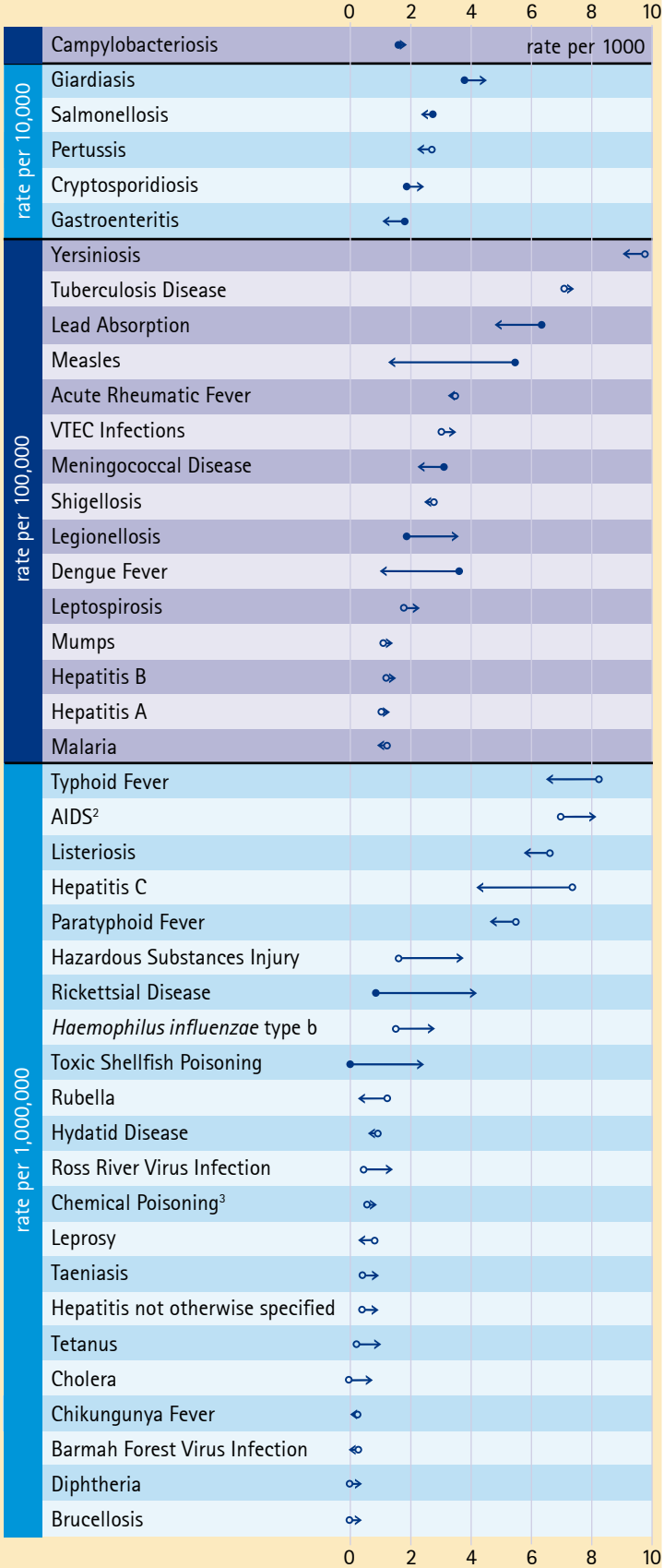
- *Notifications:* 292 notifications in the quarter (2009, 213); 1099 notifications over the last 12 months (2009, 1216), giving a rate of 25.5 cases per 100,000 population (2009, 28.2), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (224 cases) and from the same quarter last year (213 cases).

VTEC Infections

- *Notifications:* 44 notifications in the quarter (2009, 24); 150 notifications over the last 12 months (2009, 134), giving a rate of 3.5 cases per 100,000 population (2009, 3.1), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (24 cases).

National Surveillance Data

12-Monthly Notification Rate Changes[1]



Notifications per 1000 or 10,000 or 100,000 or 1,000,000 population

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 October 2009 to September 2010 and compared to previous 12-month rates.

[2] Data provided by the AIDS Epidemiology Group, University of Otago. Note: changes in the 12-month notification rate should be interpreted with caution as this often reflects late notifications.

[3] From the environment.

ENVIRONMENTAL EXPOSURES & INFECTIONS

Cryptosporidiosis

- *Notifications:* 271 notifications in the quarter (2009, 233); 1017 notifications over the last 12 months (2009, 844), giving a rate of 23.6 cases per 100,000 population (2009, 19.6), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (187 cases).

Giardiasis

- *Notifications:* 475 notifications in the quarter (2009, 381); 1941 notifications over the last 12 months (2009, 1651), giving a rate of 45.0 cases per 100,000 population (2009, 38.3), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (381 cases).

Lead Absorption

- *Notifications:* 40 notifications in the quarter (2009, 66); 193 notifications over the last 12 months (2009, 276), giving a rate of 4.5 cases per 100,000 population (2009, 6.4), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (66 cases); cases were distributed by age as follows: 13 (25–44 years), 22 (45–64 years) and 5 (65 years and over); there were 36 male and 4 female cases; 9 cases were recorded as having an occupation that involved exposure to lead: painter/decorator (4 cases), automotive radiator worker, car painter, farmer, welder (1 case each), and not specified (1 case).

Legionellosis

- *Notifications:* 66 notifications in the quarter (2009, 9); 155 notifications over the last 12 months (2009, 82), giving a rate of 3.6 cases per 100,000 population (2009, 1.9), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (35 cases) and from the same quarter last year (9 cases).

NEW, EXOTIC & IMPORTED INFECTIONS

Dengue Fever

- *Notifications:* 16 notifications in the quarter (2009, 13); 51 notifications over the last 12 months (2009, 159), giving a rate of 1.2 cases per 100,000 population (2009, 3.7), a statistically significant decrease.
- *Comments:* 12 cases were laboratory confirmed; all cases were overseas during the incubation period. Places visited or resided in were Indonesia (4 cases), Thailand (3 cases), Australia, India, Vanuatu (2 cases each), American Samoa, East Timor, Europe, Guatemala, Laos, Philippines, and Singapore (1 case each).

Rickettsial Disease

- *Notifications:* 13 notifications in the quarter (2009, 3); 18 notifications over the last 12 months (2009, 4), giving a rate of 0.4 cases per 100,000 population (2009, 0.1), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (2 cases) and from the same quarter last year (3 cases); 8 cases were murine typhus, 4 cases were rickettsial disease that was not further specified and 1 case was Q fever.

Toxic Shellfish Poisoning

- *Notifications:* 1 notification in the quarter (2009, no cases); 10 notifications over the last 12 months (2009, no cases), giving a rate of 0.2 cases per 100,000 population (2009, 0.0), a statistically significant increase.

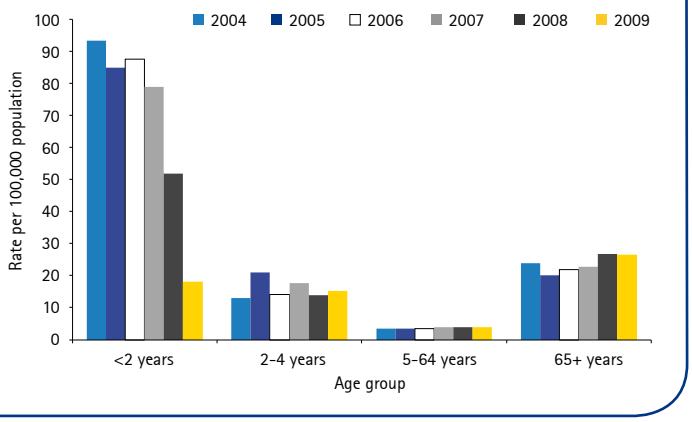
3. Other Surveillance Reports

Invasive pneumococcal disease, 2009

A four-dose schedule of the 7-valent pneumococcal conjugate vaccine (PCV-7), Prevenar®, was added to the New Zealand childhood immunisation schedule in June 2008, with a catch-up programme available for all children born on or after 1 January 2008. Since 17 October 2008, invasive pneumococcal disease (IPD) has been notifiable to medical officers of health under the Health Act 1956.

There were 697 cases of IPD notified in 2009. A *Streptococcus pneumoniae* isolate from an invasive site was received at ESR for serotyping and antimicrobial susceptibility testing from 665 (95.4%) of the cases. The impact of PCV-7 vaccination is already clearly evident among children eligible for vaccination, that is, infants <2 years old as at the end of 2009. The incidence of IPD in infants in this age group halved from 96.2 cases per 100,000 in 2007 to 46.4 per 100,000 in 2009. The reduction in rates of disease caused by PCV-7 serotypes was even more striking, with a 77% decrease from 78.8 cases per 100,000 in 2007 to 18.1 per 100,000 in 2009 in infants <2 years of age (Figure 2). Rates of disease caused by PCV-7 serotypes have not decreased in other age groups (Figure 2).

Figure 2. Rates of invasive pneumococcal disease caused by PCV-7 serotypes, by age group each year 2004–2009



In contrast to the decrease in IPD among infants <2 years old, the all-age incidence rate increased from 13.1 cases per 100,000 in 2007 to 16.1 per 100,000 in 2009. A change in 2009 from laboratory-based surveillance of invasive pneumococci to surveillance based on IPD notifications makes absolute comparisons of rates in 2009 with those for earlier years difficult. Compared with notifications, laboratory-based surveillance is likely to underestimate the incidence of IPD. Any such underestimation means that the reductions in rates of IPD among infants <2 years old since 2007 may be greater, and the all-age increase may be less, than the above rate estimates suggest.

In 2009, the all-age rate of pneumococcal meningitis was 0.9 cases per 100,000. The highest rate of meningitis occurred in the <1 year age group (11.1 per 100,000). The case-fatality rate was 5.0%. Rates of IPD among Pacific Peoples and Maori were 3.8- and 3.2-times, respectively, the rate among Europeans. The rate of disease in the most deprived NZDep2006 quintile (9–10) was 3-times that in the least deprived quintile (1–2). Of the IPD cases for whom the information was reported, 42.8% were recorded as having a chronic illness, 40.0% of cases <5 years of age were exposed to smoking in the household, and 33.3% of cases <1 year of age had been born prematurely. There were some regional differences in the incidence of IPD, with the rate in the Midland region significantly higher ($p \leq 0.05$) than that in any other region.

As with all vaccines that target only specific types, there is concern that pneumococcal serotypes not included in PCV-7 will increase and essentially 'replace' vaccine types as the principal cause of IPD. This appears to have happened to some extent in several countries, although any increases in disease due to non-vaccine serotypes have usually been somewhat smaller than the reductions in disease due to vaccine serotypes. Serotype 19A is the non-PCV-7 type most frequently reported to have increased in prevalence. As yet, the rate of 19A disease has

not increased in New Zealand. However, there has been a significant increase in serotype 1 disease, but this may not be a result of serotype replacement following the introduction of PCV-7. The increase in serotype 1 commenced in 2007 before PCV-7 was introduced, and in 2008 this serotype was mainly associated with disease in school-age children and young adults who were not eligible for PCV-7 vaccination. In addition, globally this serotype is often associated with outbreaks that occur cyclically every few years.

Penicillin and cefotaxime resistance among invasive pneumococci decreased in 2009. Most resistant invasive pneumococci belong to one of the serotypes included in PCV-7, so these decreases in resistance are consistent with the decrease in disease due to vaccine types. According to the Clinical and Laboratory Standards Institute's meningitis interpretive criteria, 17.7% of isolates were categorised as penicillin resistant. No isolates were categorised as penicillin resistant according to the interpretive criteria for the parenteral treatment of non-meningitis infections. Based on the meningitis interpretive criteria, 2.0% of isolates were cefotaxime resistant and 0.6% of isolates were resistant according to the non-meningitis interpretive criteria. There is no indication that resistance is increasing among non-PCV-7 serotypes, with PCV-7 types still accounting for over 90% of the penicillin and cefotaxime resistance in 2009, as has been the trend in recent years.

A more detailed report will be available at http://www.surv.esr.cri.nz/surveillance/IPD.php

Reported by Helen Heffernan and Diana Martin, Health 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 (July to September 2010). Comparisons are made to the previous quarter (April to June 2010), and to the same quarter in the previous year (July to September 2009). Note that the outbreak data in this section are notified to ESR by the Public Health Services.

General

- 158 outbreaks notified in this quarter (1404 cases).
- 100 are 'final' reports (1003 cases); 58 are 'interim' reports (401 cases) that have yet to be finalised and closed.

All data that follow relate to final reports only.

- 10.0 cases on average per outbreak, compared with 8.4 cases per outbreak in the previous quarter (17.5 cases per outbreak in the same quarter of last year).
- 14 hospitalisations: sapovirus (4 cases), norovirus (3 cases), *Giardia* (2 cases), *Leptospira hardjo* (2 cases), *Cryptosporidium*, *Escherichia coli* O157:H7, and rotavirus/norovirus (1 case each).
- No deaths.

Pathogens

- 31 'gastroenteritis' outbreaks (310 cases).
- 20 norovirus outbreaks (382 cases).
- 18 *Giardia* outbreaks (72 cases).
- 8 *Cryptosporidium* outbreaks (20 cases).
- 6 rotavirus outbreaks (103 cases).
- 3 pandemic influenza (H1N1) 09 virus (31 cases).
- 2 *Bordetella pertussis* outbreaks (10 cases).
- 2 sapovirus outbreaks (28 cases).
- 2 *Shigella sonnei* biotype a outbreaks (4 cases).
- 1 acute respiratory infection outbreak (6 cases).
- 1 *Campylobacter* outbreak (4 cases).
- 1 chemical poisoning type of illness outbreak (2 cases).
- 1 *E. coli* O157:H7 outbreak (2 cases).
- 1 *L. hardjo* outbreak (3 cases).
- 1 murine typhus outbreak (2 cases).
- 1 rotavirus/norovirus outbreak (22 cases).
- 1 *Salmonella* Typhimurium phage type 135 outbreak (2 cases).

Modes of Transmission

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

- 89 person-to-person, from (non-sexual) contact with an infected person (including droplets): 25 'gastroenteritis' (294 cases), 19 norovirus (367 cases), 17 *Giardia* (66 cases), 8 *Cryptosporidium* (20 cases), 6 rotavirus (103 cases), 3 pandemic influenza (H1N1) 09 virus (31 cases), 2 *B. pertussis* (10 cases), 2 sapovirus (28 cases), 2 *S. sonnei* biotype a (4 cases), 1 acute respiratory infection (6 cases), 1 *Campylobacter* (4 cases), 1 *E. coli* O157:H7 (2 cases), 1 rotavirus/norovirus (22 cases), and 1 *S.* Typhimurium phage type 135 (2 cases).
- 24 environmental, from contact with an environmental source (e.g. swimming): 11 norovirus (224 cases), 4 'gastroenteritis' (109 cases), 4 *Giardia* (11 cases), 3 *Cryptosporidium* (7 cases), and 2 rotavirus (38 cases).
- 17 foodborne, from consumption of contaminated food or drink (excluding water): 12 'gastroenteritis' (29 cases), 2 norovirus (17 cases), 1 *Giardia* (6 cases), 1 *Cryptosporidium* (3 cases), and 1 chemical poisoning type of illness (2 cases).
- 12 waterborne, from consumption of contaminated drinking water: 9 *Giardia* (36 cases) and 3 *Cryptosporidium* (7 cases).
- 6 zoonotic, from contact with infected animals: 3 *Cryptosporidium* (8 cases), 2 *Giardia* (5 cases), and 1 *L. hardjo* (3 cases).
- 1 vectorborne: murine typhus (2 cases).
- 1 mode of transmission unknown: 'gastroenteritis' (2 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.

- 30 home: 11 *Giardia* (43 cases), 7 'gastroenteritis' (38 cases), 4 *Cryptosporidium* (11 cases), 3 pandemic influenza (H1N1) 09 virus (31 cases), 2 *B. pertussis* (10 cases), 1 *E. coli* O157:H7 (2 cases), 1 norovirus (2 cases), and 1 *S.* Typhimurium phage type 135 (2 cases).
- 14 childcare centre: 5 'gastroenteritis' (63 cases), 5 rotavirus (91 cases), 2 *Cryptosporidium* (5 cases), 1 *B. pertussis* (6 cases), and 1 norovirus (17 cases).
- 14 rest home: 7 'gastroenteritis' (156 cases), 3 norovirus (98 cases), 1 acute respiratory infection (6 cases), 1 rotavirus (12 cases), 1 rotavirus/norovirus (22 cases), and 1 sapovirus (9 cases).
- 12 hospital (acute care): 7 norovirus (114 cases), 2 'gastroenteritis' (13 cases), 2 *S. sonnei* biotype a (4 cases), and 1 sapovirus (19 cases).
- 12 restaurant/café: 8 'gastroenteritis' (20 cases), 2 norovirus (17 cases), 1 chemical poisoning type of illness (2 cases), and 1 *Giardia* (6 cases).
- 11 hospital (continuing care): 8 norovirus (200 cases) and 3 'gastroenteritis' (40 cases).
- 6 takeaways: 'gastroenteritis' (12 cases).
- 5 farm: 3 *Cryptosporidium* (7 cases), 1 *Giardia* (2 cases), and 1 *L. hardjo* (3 cases).
- 4 swimming/spa pool: 2 *Cryptosporidium* (4 cases) and 2 *Giardia* (7 cases)
- 3 hotel/motel: 3 *Giardia* (11 cases).
- 2 school: 'gastroenteritis' (26 cases) and pandemic influenza (H1N1) 09 virus (27 cases).
- 5 'other setting': 3 *Giardia* (10 cases), 1 *B. pertussis* (4 cases), and 1 murine typhus (2 cases).
- 8 outbreaks with no setting selected: 5 *Giardia* (19 cases), 1 *Campylobacter* (4 cases), 1 *Cryptosporidium* (2 cases), and 1 'gastroenteritis' (9 cases).

5. Outbreak Case Reports

'Monsters in the Mousse' – *Salmonella* Typhimurium phage type 155 outbreak from South Canterbury

This common source outbreak involved two separate groups of individuals, one group of 34 people (12 cases) who attended a wedding anniversary celebration in South Canterbury, and another group of 10 friends and family members (9 cases). Twenty-one cases (10 confirmed) were identified and the common foodstuff consumed by the two groups was chocolate mousse cake made at a café in South Canterbury. *Salmonella* Typhimurium phage type 155, which is uncommon in New Zealand, was identified as the causative organism.

On 3 September 2010, Community & Public Health, Timaru, received notification from Timaru Hospital of an 87 year old man who had been admitted on 29 August and found to have salmonellosis. Contact was made with a family member who advised that a number of other people who had attended a 60th wedding anniversary celebration on 28 August, were also ill. A list of guests from various parts of New Zealand, and their contact details was obtained. Shortly afterwards, a telephone call was received from Public Health South advising of two connected cases of salmonellosis in Dunedin.

The venue for the wedding anniversary celebration was a South Canterbury sports club which had provided most of the catering. Timaru District Council environmental health officers were involved and they quickly provided a preliminary report on the food provided and the club workers involved in food preparation. Telephone contact was made with as many of the guests and food handlers as feasible, and a Community & Public Health standard event-based gastrointestinal questionnaire was used to gather information (27 out of 34 people who attended the celebration provided information).

On Friday 10 September, a telephone call was received from a health protection officer at Regional Public Health, Wellington, who was investigating two confirmed cases of salmonellosis who had returned from Hanmer Springs where six female friends met on 27 August. One of the friends from South Canterbury had taken a chocolate mousse cake with her that she had bought from the same local café that sold the chocolate mousse cake to the wedding anniversary group. She and her four family members had also become ill, having eaten leftover cake which she had taken back home.

The only common significant risk factor identified for the two groups was chocolate mousse cake, with a risk ratio of 7.76, CI 1.17–51.59 and p value of 0.0018 for the wedding anniversary group (Table 1). The owners of the café were interviewed on 10 September about the manufacture of the two cakes. The cakes were baked on 26 August, iced the following morning and layered with mousse. One cake was collected and taken to Hanmer Springs that day, the other was refrigerated and taken to the wedding anniversary celebration on the 28 August. The mousse was made in one batch using water, liqueur, gelatine, egg yolks, cream and chocolate. The ingredients were heated and combined, while beaten egg whites and whipped cream were added at the end.

Table 1: Attack rates and risk ratios of food items consumed

Food	Persons who ate the food			Persons who did not eat the food			Risk ratio	95% CI	p value
	Case	Not a case	Attack rate (%)	Case	Not a case	Attack rate (%)			
Chocolate Mousse Cake	12	5	71	0[1]	10	0	7.76	(1.17, 51.59)	0.0018
Savoury	6	10	38	5	6	45	0.82	(0.33, 2.04)	0.5
Sandwich	6	9	40	5	7	42	0.93	(0.39, 2.39)	0.61

[1]nil value was changed to 1 to allow calculation of risk ratio.
Note: All values calculated on the wedding anniversary group only.

Suspicion rested on the eggs which, having been only partly heated during mousse preparation, were a possible source of *Salmonella* contamination. The eggs were found to be delivered daily by a small, local free range egg supplier. After investigation it was discovered the supplier did not operate with a risk management programme under the Animal Products Act 1999, which is a requirement for producers supplying commercial food premises. The supplier's eggs, including external egg surfaces and contents, cartons, and hen faeces, were tested for *Salmonella* by the New Zealand Food Safety Authority (NZFSA) and all tested negative. Feed was not tested as the original feed had been changed to a new type. The food handler faecal sample was also negative for *Salmonella*. The café visit by the NZFSA noted nothing of concern with processing or staff hygiene practices.

The source of the *Salmonella* could not be identified. Despite this, the café owners, on the recommendation of Community & Public Health, agreed to immediately stop using raw eggs in any food, including in mousse or salad dressing. Poached eggs would be made using supermarket eggs only. The café operates under a voluntary implementation programme, and the NZFSA further reiterated to the café operators the risks involved with raw egg products and possible contamination from handling potentially contaminated egg shells. The NZFSA recommends the current version of the food control plan template be updated with additional information regarding approved supplier checks.

Acknowledgements to Timaru District Council Health Department, Regional Public Health, Public Health South, Dunedin, Nelson Marlborough Public Health Service and the NZFSA.

Reported by Ed Bennett and Keith Turner, Health Protection Officers, Community & Public Health, Timaru, and Dr Imogen Thompson, Public Health Registrar, Regional Public Health.

The emergence of *Salmonella* enterica serotype 4,[5],12:i:- in New Zealand

From an international public health perspective *Salmonella enterica* serotype 4,[5], 12:i:- (*Salmonella* 4,[5],12:i:-) has become increasingly important because of its rapid rise to prominence as a cause of illness, and because it is showing resistance to multiple antimicrobial drugs. While this serotype was identified only rarely before the mid-1990s, it is now one of the top 10 causes of salmonellosis in the UK, Portugal, Spain, Brazil, the USA, Thailand and Taiwan, and it was the fourth most common serotype identified in the European Union in 2006.[1] Of particular concern is that this serotype is exhibiting resistance to multiple antimicrobial drugs, including ampicillin, streptomycin, sulphonamides and tetracycline. Furthermore, it is associated with higher rates of hospitalisation than other *Salmonella* serotypes.[2,3]

Salmonella 4,[5],12:i:- is uncommon in New Zealand, and ESR has only specifically tested for it since June 2009. However, this serotype is a monophasic variant of *Salmonella* Typhimurium, and might have been misidentified prior to June 2009. Twenty-eight isolates of *Salmonella* 4,[5],12:i:- out of 2200 human *Salmonella* cases have been submitted to ESR since the start of 2009. Cases were mainly from Auckland (14) or Christchurch (7), but isolates were also submitted from Hamilton (2), Dunedin (1), Wellington (2) Hawke's Bay (1) and Tauranga (1). Ten of the cases confirmed recent overseas travel, mainly from Thailand, but the number of cases associated with overseas travel is most likely under reported as travel information is not always provided on the laboratory request form. There are currently no confirmed non-human isolates in New Zealand.

In July 2010, a cluster of patients infected with *Salmonella* 4,[5],12:i:- was notified to the Auckland Regional Public Health Service. Early enquiries suggested that the four cases of infection had not been acquired overseas. An investigation was started to identify potential sources of infection. Initially, the standard salmonellosis questionnaire was administered to identify common links in relation to time and place, and among groups of people. The questionnaire was then revised to include questions about a number of ethnic foods, condiments and sauces used in South-East Asian cuisine, and the cases were re-interviewed.

Four patients were reported to have been infected with *Salmonella* 4,[5],12:i:- from 2–13 July 2010. The cases belonged to the same South-East Asian ethnic group and were part of the same social network. All had attended a birthday party held in one of the case's homes. The party was initially thought to have been held on the last weekend of June and was identified as the common event for the cluster. However, further interviews undertaken and contact with the cases general practitioners to clarify the dates of symptom onset, determined that the birthday party was held on 2 July and that the index case for the cluster had been unwell prior to this date. The remaining three cases developed symptoms within

one incubation period following the party. The index case was aged 4 years and had not been involved in food preparation for the party.

Subsequently, the focus of the investigation turned to foods consumed at the party that may have been prepared from ingredients that the index case may have had prior access to, particularly imported products. A number of South-East Asian products have been implicated as a reservoir for *Salmonella* including poultry, pork products and fermented fish. A fermented fish paste imported from Thailand was used to prepare the party food, as well as being regularly used by the families interviewed. The fish paste was often boiled up and made into a broth and kept in a jar at room temperature. The paste was then used as a dipping sauce or dressing for a number of dishes. In addition, one party attendee mentioned that kee piah, a traditional dish made from cow bile and intestinal broth, was also prepared for the occasion. The source of the cow intestine and bile used to make the kee piah was unknown.

Samples of ingredients used for food preparation in the index case's household (including ingredients for the party food) were collected and sent for testing. Unfortunately, no samples of the kee piah, fish paste or fish paste broth used prior to and for the birthday party were available for testing. All test results of other food specimens were also negative for *Salmonella*.

This investigation was ultimately inconclusive as no food source was identified. There is potential for the index case to have been infected by an unknown reservoir, and then for person-to-person transmission to have occurred to family and friends. This scenario highlights the need to think laterally when a number of obscure and potentially high-risk foods are consumed, particularly those that are imported, as these could cause salmonellosis.

Key points

- *Salmonella* 4,[5],12:i:- is an important cause of salmonellosis overseas, with some isolates showing an increasing prevalence in antibiotic resistance along with significant morbidity.[2] Testing for this serotype now occurs in New Zealand, and it may become a more common cause of salmonellosis in the future.
- *Salmonella* 4,[5],12:i:- can be found in a number of reservoirs. Future cases of this serotype in people who do not have a history of overseas travel should be investigated thoroughly, including collection of an in-depth history of imported and local food items consumed that may be specific to the ethnicity of the case.

For list of references see – www.surv.esr.cri.nz/surveillance/NZPHSR.php

Reported by Sonia van Gessel, Public Health Registrar, Auckland Regional Public Health Service.

6. Laboratory Surveillance

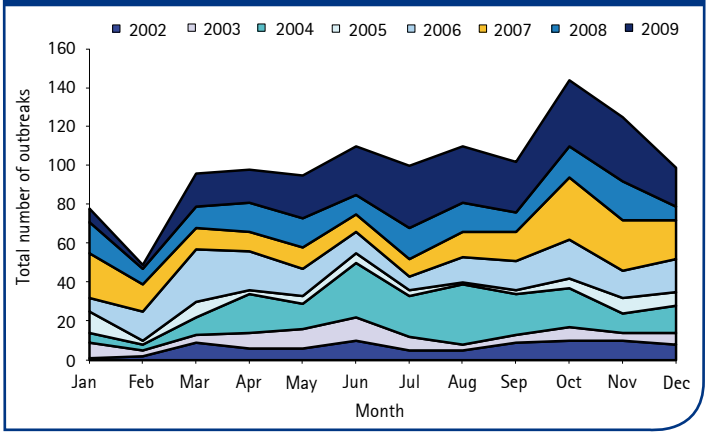
New Zealand viral gastroenteritis outbreaks, 2009

Noroviruses are the predominant cause of epidemic acute viral gastroenteritis worldwide and cause infections in all age groups. They are transmitted by foodborne, waterborne, environmental and person-to-person routes. Secondary spread via person-to-person and environmental transmission is common. Norovirus outbreaks are prevalent in institutional settings, especially rest homes and hospitals settings, and often impose significant economic impacts on healthcare services. Sapoviruses and astroviruses also cause gastroenteritis but are less commonly reported in outbreak settings.

The Norovirus Reference Laboratory (NRL) at ESR carries out laboratory surveillance of norovirus, sapovirus and astrovirus outbreaks for the New Zealand Ministry of Health. This includes analysis of faecal specimens from cases of gastroenteritis, real-time (RT)-PCR to identify norovirus genogroup I (GI) and genogroup II (GII) strains, sapoviruses and astroviruses. DNA sequencing of representative norovirus outbreak strains and collation of data on the predominant genotypes occurring in New Zealand is carried out to trace sources of infection for epidemiological investigations and to monitor the emergence of new variant strains which may cause large epidemics. The NRL is a member of the international NoroNet network, which circulates information on disease trends and emerging norovirus variants to norovirus reference centres around the world. NoroNet consists of virologists who carry out sequencing of norovirus strains on a national level and share this data for international molecular surveillance as a way to reduce norovirus infections.

In 2009, 1671 faecal specimens were submitted to the NRL for norovirus detection, 1298 specimens were tested and 722 (55.6%) were confirmed as norovirus positive. The NRL confirmed norovirus presence in 265 outbreaks. These figures show a large increase in reported norovirus activity when compared with 2008, when 1065 specimens were received and 159 (14.9%) were confirmed as norovirus outbreaks. Once again, no seasonal winter peak was observed in 2009. The highest number of laboratory-confirmed outbreaks occurred in October (34) and the lowest number in February (2) (Figure 3). This is consistent with data analysed over the last 8 years that show the number of reported outbreaks has consistently peaked in October.

Figure 3. Monthly occurrence of norovirus outbreaks, 2002–2009



The majority (74.0%) of outbreaks occurred in healthcare settings such as rest-homes (162) and acute-care hospitals (34) (Table 2). Other common outbreak settings included catering establishments, child-care and play centres and the home.

Table 2: Norovirus outbreak settings, 2009

Outbreak Setting	Number of outbreaks
Healthcare-elderly	162
Healthcare-medical	34
Catered setting	30
Child-related	15
Home	11
Unknown	3
Hostel/institution/hotel/camp	2
Workplace	2
Community event	1
Shellfish	1
Travel-plane	1
Travel-ship	1
Total	**265**

Noroviruses are classified into five genogroups, GI-IV, but genogroups GI and GII are the main causes of human disease. A range of norovirus genotypes were identified in 2009, of which GII.4 occurred most frequently, being identified in 80.8% (214/265) of outbreaks (for a detailed breakdown of norovirus genotypes identified in 2009 refer to www.surv.esr.cri.nz/surveillance/NZPHSR.php). Only two GI genotypes were detected in 2009, in contrast to 2008 when several different GI genotypes were circulating.

In recent years, GII.4 strains have been internationally reported as the most common causes of outbreaks in institutional settings, including rest homes, hospitals, and cruise ships; this has also occurred in New Zealand. Since 2002, several new variants of GII.4 strains have emerged and become predominant in norovirus outbreaks worldwide. These have been named 2002-Farmington Hills, 2004-Hunter, 2006a-Laurens, 2006b-Minerva and more recently 2008-Apeldoorn. In 2008, GII.4 2006b was the predominant strain throughout New Zealand, but GII.4 2008

appeared during the year, and in 2009 replaced 2006b as the predominant strain. GII.4 2008 was identified in 71.7% (190/265) outbreaks, and 2006b in 6.0% (16/265) of outbreaks. Seven GII.4 strains were not subtyped. These GII.4 variants are believed to arise as escape mutants following a major outbreak season. They then cause further epidemics as the population is not immune to the new variant.

Sapovirus and astrovirus outbreaks

In 2009, specimens from 47 outbreaks where norovirus was not detected were also analysed for presence of two other gastroenteritis-causing enteric viruses, astrovirus and sapovirus. Astroviruses were identified in four outbreaks and sapoviruses in one outbreak, which occurred in rest homes. A recent report from Europe has indicated an increase in sapovirus outbreaks among the elderly.[1] During the first 6 months of 2010, sapovirus illness has increased in New Zealand. Sapoviruses have been identified in seven outbreaks, five in rest homes and two in home settings.

For list of references see – www.surv.esr.cri.nz/surveillance/NZPHSR.php

Reported by Gail Greening, Norovirus Reference Laboratory, Food Programme, ESR.

Laboratory-based legionellosis surveillance

Between January and October 2010 the Legionella Reference Laboratory confirmed 129 cases of legionellosis compared with 76 cases for the 2009 calendar year. This is a significant increase of >40% in annual case numbers compared with the previous 3 years where case numbers have been between 72 and 76 (Table 3). For the 129 legionellosis cases for the year to date, 97 fit the confirmed case definition (culture-positive and/or a four-fold rise in antibody titre and/or sustained elevated titres on two or more occasions and/or a positive *Legionella* urinary antigen test) and 32 fit the probable case definition (a single elevated antibody titre or *Legionella* PCR test-positive).

Table 3. *Legionella* species identified as causative agent by year

Legionella species	2007		2008		2009		2010[1]	
	No.	%	No.	%	No.	%	No.	%
L. pneumophila sg1	18	25.0	21	28.4	25	32.9	24	18.6
L. pneumophila other than sg1	11	15.3	4	5.4	7	9.2	17	13.2
L. longbeachae	26	36.1	38	51.3	32	42.1	42	32.6
All other *Legionella*	17	23.6	11	14.9	12	15.8	46	35.6
Total	**72**	**100.0**	**74**	**100.0**	**76**	**100.0**	**129**	**100.0**

[1]January to October 2010 only
sg: serogroup

Legionella longbeachae and *L. pneumophila* continue to be the predominant *Legionella* species responsible for disease, causing 42 and 41 cases respectively. Of note, however, is the increase in the numbers of cases being caused by *Legionella* species other than *L. pneumophila* or *L. longbeachae*, with *L. dumoffii* identified as the causative agent for 13 cases so far this year. For the previous 3 years there have been four, five, and four cases caused by this strain.

Another *Legionella* species showing a significant increase in prevalence this year is *L. bozemanae* with nine cases being laboratory-diagnosed between January and October 2010 compared with one, two and one cases for the previous 3 years. All but two of the cases for the year-to-date occurred in areas understood to be endemic for *Rickettsia typhi*. There is a known serological cross-reaction between antibodies to this organism and *L. bozemanae* in the *Legionella* indirect immunofluorescent assay (IFA) test, however, four cases were serologically confirmed and five fitted the probable case definition.

So far this year there have been ten cases where the *Legionella* causative agent has not been identified to the species level. Four of these are from cases where only a single serum sample was received and six are from PCR-positive cases where no convalescent serum or culture isolate was received. Occasionally early convalescent serum contains cross-reactive antibodies that make identification of the causative agent difficult. In this situation referring laboratories are encouraged to forward a later convalescent serum sample to help in the species identification. Since the issue of false positive results in the PCR test are also difficult to address, a positive result needs to be interpreted with caution. It is important that appropriate follow-up testing is carried out to confirm the diagnosis and enable identification of the infecting *Legionella* species. Ideally the extracted nucleic acid and an aliquot of the original clinical specimen should be referred to the Legionella Reference Laboratory for confirmation and typing.

Source tracing

Source tracing of notified legionellosis cases continues to identify composted vegetative material as the most common source for those with a *L. longbeachae* infection. Invariably, cases with disease caused by *L. longbeachae* have been exposed to the material during the incubation period for the illness. *Legionella longbeachae* is the most prevalent *Legionella* species isolated from compost (for a table of *Legionella* species isolated from different environmental sources by year refer to www.surv.esr.cri.nz/surveillance/NZPHSR.php).

Legionella pneumophila infections can account for up to 50% of all legionellosis cases annually, yet very few infections are traced back to a domestic potable source. Any infection with *Legionella* requires exposure to a contaminated environmental source. Cooling towers may represent an underestimated source of the organism since *L. pneumophila* strains are the predominant *Legionella* isolated from cooling tower waters. This suggests cooling towers are the source of sporadic community acquired cases of legionellosis where the source tracing exercise has eliminated the domestic water source for the infection.

Source tracing has not identified where contact with *L. dumoffii* has occurred although anecdotal evidence and previous history of cases infected with *L. dumoffii* suggests contact with soil or compost.

Legionella continues to cause significant disease in New Zealand. So far this year there have been six deaths of which four were laboratory-confirmed cases and two were probable cases. No outbreaks have been reported and all cases are sporadic community acquired incidents. A Spring spike in numbers has again been observed this year mainly associated with the increase in gardening activity and compost use.

Reported by David Harte, Legionella Reference Laboratory, Health Programme, ESR.

Mycology

Tables detailing the biannual summary of opportunistic mycoses and aerobic actinomycetes in New Zealand are available at www.surv.esr.cri.nz/surveillance/NZPHSR.php

New Zealand Public Health Surveillance Report is produced quarterly by ESR for the Ministry of Health and may be downloaded in PDF format from www.surv.esr.cri.nz

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