Volume 10 Issue 2 ISSN 1176-2888 (Print) ISSN 1178-8313 (Online)

New Zealand Public Health Surveillance Report

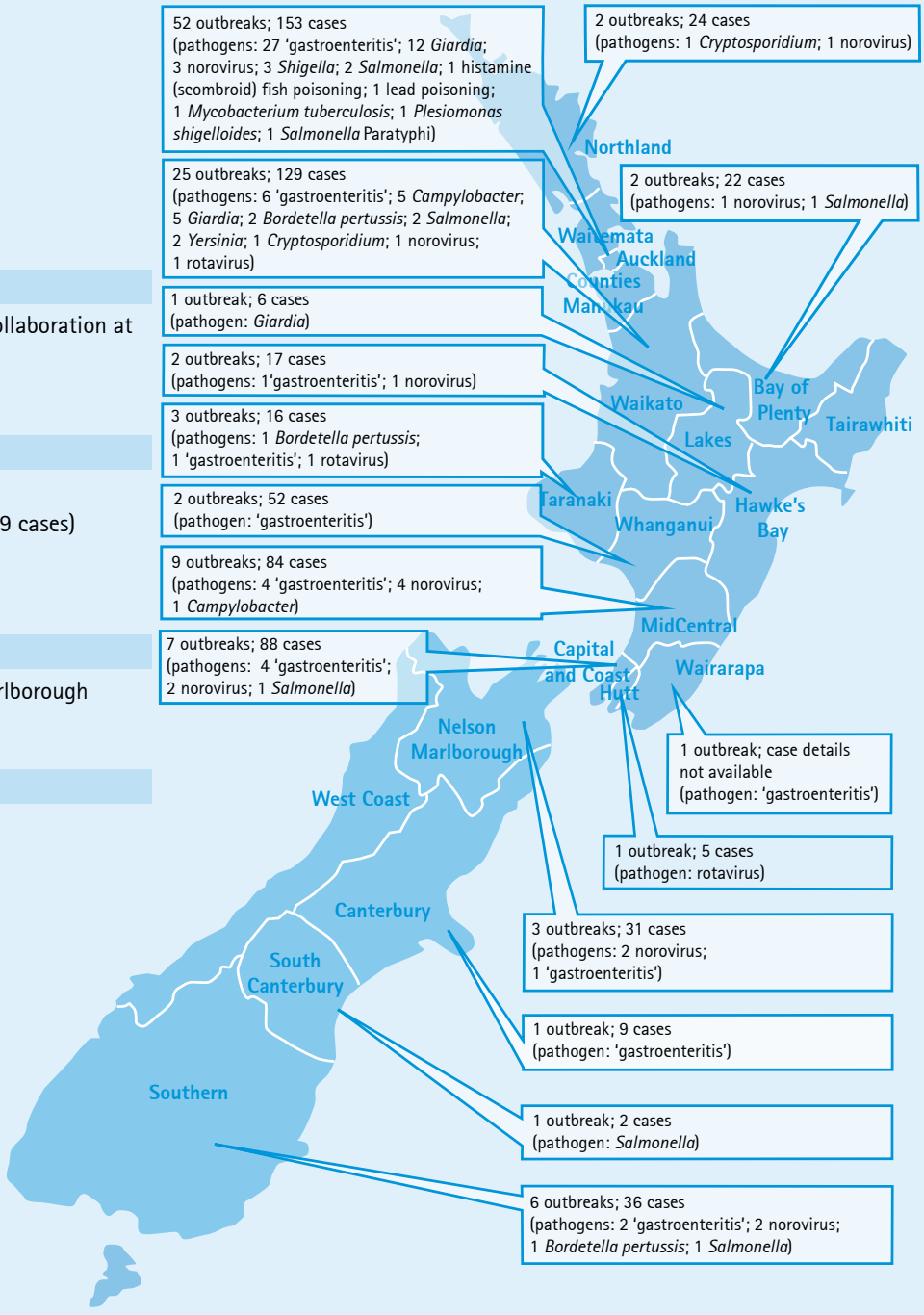
June 2012: Covering January to March 2012

Contents & Highlights

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

This Quarter's Outbreaks

Notification and outbreak data in this issue are drawn from the January to March quarter of 2012. 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 April 2012. Outbreaks reporting exposures in more than one geographic location are assigned to the district health board with the most cases. One outbreak involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to totals.



1. Editorials

Summary of notifiable disease surveillance trends for 2011

In 2011, 16,294 cases of notifiable disease were reported through EpiSurv, the national notifiable disease database. This was the second consecutive year in which the total number of notifications has decreased (notifications were 19,803 and 17,294 in 2009 and 2010, respectively). The total number of disease notifications in 2011 is the second lowest in the last 15 years (after 2008 with 13,933 cases).

Between 2010 and 2011, there were some significant changes in the numbers of cases reported for individual diseases. There were statistically significant increases in reported cases of measles (48 to 597, 1144%), pertussis (872 to 1998, 129%), acute gastroenteritis (491 to 630, 28%), and yersiniosis (406 to 514, 27%).

Between 2010 and 2011, statistically significant decreases occurred in reported cases of hepatitis A (46 to 26, -43%), cryptosporidiosis (954 to 610, -36%), campylobacteriosis (7346 to 6692, -9%), and salmonellosis (1146 to 1056, -8%).

Enteric diseases

Enteric diseases continued to comprise the majority (more than 70%) of notifications in 2011. Campylobacteriosis contributed 41% of all notifications in 2011 (6692 cases) despite the significant decrease in the notification rate of campylobacteriosis in 2010 and 2011. Campylobacteriosis notifications have more than halved since the peak of 15,873 cases in 2006. Several other enteric diseases including cryptosporidiosis, hepatitis A and salmonellosis, also showed significant decreases in notifications between 2010 and 2011. In contrast, there were significant increases in the notification rates of acute gastroenteritis and yersiniosis between 2010 and 2011. Enteric diseases continue to show seasonal variations in notifications, in particular campylobacteriosis (summer peak), cryptosporidiosis (spring peak), salmonellosis (peak varies with serotype), and verotoxin- or Shiga toxin-producing *Escherichia coli* infection (autumn and spring peaks).

Vaccine preventable diseases

Three vaccine preventable diseases contributed notably to the total notification counts in 2011: pertussis, measles and invasive pneumococcal disease (IPD). At 1998 cases, pertussis was the second most commonly reported notifiable disease in 2011 after campylobacteriosis. Although there was a significant increase in the pertussis notification rate from 2010 to 2011 (20.0 to 45.4 per 100,000 population), the 2011 rate was well below that seen in previous pertussis epidemics (107.6, 85.3 and 65.8 per 100,000 for the 2000, 2004 and 2005 epidemic years, respectively).

A total of 597 measles cases were notified in 2011. This was a significant increase compared with the number of cases reported in 2010 (48), and the largest annual count since the last measles epidemic, which peaked in 1997 with 1984 cases.

In 2011, 552 cases of IPD were notified. The 2011 notification rate (12.5 per 100,000) was similar to the 2010 rate (12.2 per 100,000, 535 cases), but was a significant decrease compared with the 2009 rate (16.1 per 100,000, 697 cases). IPD was made notifiable following the introduction of the 7-valent pneumococcal conjugate vaccine on 17 October 2008.

Exotic diseases

All cases of arboviral disease, leprosy, Q fever and taeniasis notified in 2011 had overseas exposures that accounted for their infection. Among the five cases of murine typhus notified in 2011, three acquired their infection locally with the remaining two becoming infected overseas. There was no evidence of any recent locally-acquired hydatid disease.

Outbreaks

In 2011, 580 outbreaks were reported involving 7893 cases. This represented a decrease in the number of outbreaks but an increase in the number of cases associated with outbreaks compared with 2010 (606 outbreaks with 6321 cases). The most common pathogen implicated was norovirus (181 outbreaks, 4013 cases), followed by *Giardia spp.* (72 outbreaks, 242 cases). Outbreaks reported in 2011 were most commonly associated with private homes (152 outbreaks, 803 cases), followed by long-term care facilities (131 outbreaks, 3089 cases).

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

Reported by Health Intelligence Team, Health Programme, ESR.

An update on sexually transmitted infections surveillance

In New Zealand, sexually transmitted infections (STIs) are not notifiable and as a result surveillance efforts are based on voluntary provision of data. ESR carries out clinic and laboratory based surveillance of nine STIs, including chlamydia, gonorrhoea, syphilis and anogenital warts on behalf of the Ministry of Health.

In 2011, a programme of work began at ESR to make improvements to the STI surveillance system. The Ministry of Health, the New Zealand Sexual Health Society and ESR collaborated with other stakeholders to identify priorities for addressing gaps in the current approach to STI surveillance. Development activities will focus on improved identification and description of the burden of disease in population groups that are most affected; describing testing patterns and changes over time; and reporting surveillance information in a more user friendly way.

Immediate changes will be noticeable in the Sexually Transmitted Infections in New Zealand: Annual Surveillance Report 2011, which takes a new format this year. New analyses have been added including male to female ratios in laboratory diagnosis of chlamydia and gonorrhoea and the cases diagnosed in contributing clinics as a proportion of all positive tests in each district health board (DHB). Feedback is welcomed on the new format and analyses.

ESR produces quarterly reports for clinic and laboratory based surveillance. These reports have been updated to present a clearer picture of DHB-level trends. The reports are available on line.

During the year ESR will be working with clinics and laboratories on measures to enhance the surveillance of STIs. We plan to work with laboratories to identify a means of collecting ethnicity information, important particularly to document and monitor the higher burden of STIs indicated in Māori and Pacific populations. Ensuring information privacy is an important part of this project. Currently we collect basic demographic information for all positive specimens. Ideally, ESR would like to extend this to all specimens tested, enabling testing and positivity rates in different groups to be compared. We will be working with the laboratories to see whether this will be feasible.

Historically clinic surveillance had been used as an indicator of chlamydia and gonorrhoea incidence. With increasing laboratory participation nationwide that function is no longer as critical, but clinics can provide additional valuable information. Sexual Health Clinics are investigating providing risk behaviour information such as sex of partner to enhance knowledge about STIs in men who have sex with men, another group with a higher burden of disease. Family Planning Clinics are exploring their ability to provide the reason that tests are undertaken (e.g., symptomatic, pre-procedure or opportunistic testing). Concurrently at ESR we are updating our information management processes to make them more robust and able to accommodate additional requirements.

We would like to thank all participating organisations for their commitment to STI surveillance and co-operation as improvements are made.

STI surveillance reports are available at http://www.surv.esr.cri.nz/surveillance/surveillance.php

Reported by Bronwyn Morris, Public Health Registrar, Health Intelligence Team, ESR.

2. Notifiable Disease Surveillance

The following is a summary of disease notifications for the January to March quarter of 2012 and cumulative notifications and rates calculated for a 12-month period (April 2011 to March 2012). 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 April 2012. 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

Hepatitis B

- *Notifications:* 16 notifications in the quarter (2011, 12); 55 notifications over the last 12 months (2011, 50), giving a rate of 1.2 cases per 100,000 population (2011, 1.1), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (4 cases). Cases were aged between 17 and 61 years.

Invasive Pneumococcal Disease

- *Notifications:* 71 notifications in the quarter (2011, 76); 547 notifications over the last 12 months (2011, 539), giving a rate of 12.4 cases per 100,000 population (2011, 12.3), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (123 cases). Cases were aged between 9 days and 92 years, with 10 cases under the age of 2 years.

Measles

- *Notifications:* 58 notifications in the quarter (2011, 35); 620 notifications over the last 12 months (2011, 54), giving a rate of 14.1 cases per 100,000 population (2011, 1.2), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly decrease from previous quarter (310 cases) and a statistically significant quarterly increase from the same quarter last year (35 cases). 43 cases were laboratory confirmed.

Pertussis

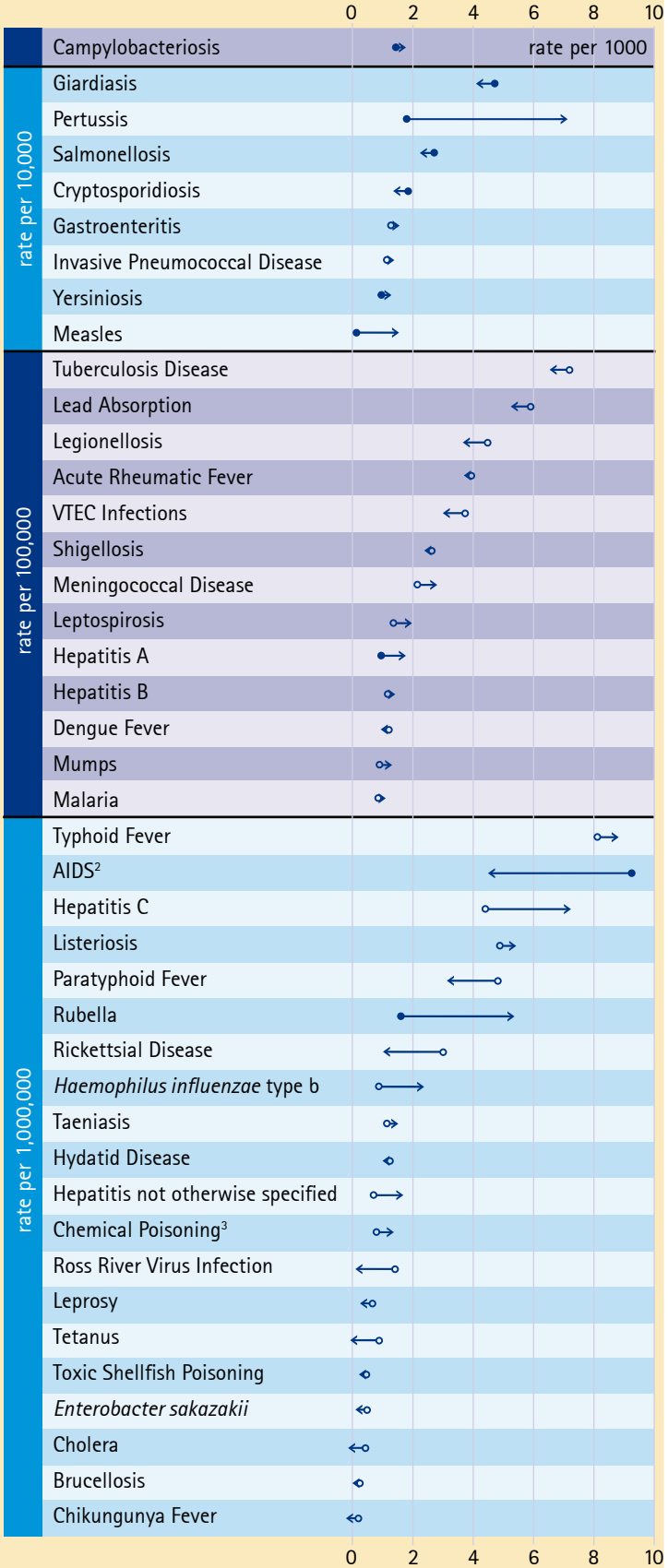
- *Notifications:* 1251 notifications in the quarter (2011, 185); 3064 notifications over the last 12 months (2011, 766), giving a rate of 69.6 cases per 100,000 population (2011, 17.5), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (185 cases).

Rubella

- *Notifications:* 3 notifications in the quarter (2011, 3); 23 notifications over the last 12 months (2011, 7), giving a rate of 0.5 cases per 100,000 population (2011, 0.2), a statistically significant increase.
- *Comments:* All 3 cases were laboratory confirmed.

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 April 2011 to March 2012 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.

ENTERIC INFECTIONS

Campylobacteriosis

- *Notifications:* 2220 notifications in the quarter (2011, 1481); 7430 notifications over the last 12 months (2011, 6708), giving a rate of 168.7 cases per 100,000 population (2011, 153.6), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (1481 cases).

Salmonellosis

- *Notifications:* 343 notifications in the quarter (2011, 369); 1030 notifications over the last 12 months (2011, 1178), giving a rate of 23.4 cases per 100,000 population (2011, 27.0), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (214 cases).

VTEC Infections

- *Notifications:* 46 notifications in the quarter (2011, 67); 133 notifications over the last 12 months (2011, 163), giving a rate of 3.0 cases per 100,000 population (2011, 3.7), not a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (20 cases) and a statistically significant quarterly decrease from the same quarter last year (67 cases).

Yersiniosis

- *Notifications:* 128 notifications in the quarter (2011, 129); 513 notifications over the last 12 months (2011, 423), giving a rate of 11.6 cases per 100,000 population (2011, 9.7), a statistically significant increase.

ENVIRONMENTAL EXPOSURES & INFECTIONS

Cryptosporidiosis

- *Notifications:* 110 notifications in the quarter (2011, 85); 635 notifications over the last 12 months (2011, 804), giving a rate of 14.4 cases per 100,000 population (2011, 18.4), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (235 cases).

Giardiasis

- *Notifications:* 512 notifications in the quarter (2011, 616); 1830 notifications over the last 12 months (2011, 2046), giving a rate of 41.5 cases per 100,000 population (2011, 46.8), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (392 cases) and a statistically significant quarterly decrease from the same quarter last year (616 cases).

Lead Absorption

- *Notifications:* 79 notifications in the quarter (2011, 77); 232 notifications over the last 12 months (2011, 258), giving a rate of 5.3 cases per 100,000 population (2011, 5.9), not a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (48 cases); cases were distributed by age as follows: 1 (5–14 years), 1 (15–24 years), 34 (25–44 years), 33 (45–64 years), 9 (65 years and over), and 1 (uknown age); there were 68 male, 9 female, and 2 cases with unknown sex; 48 cases were recorded as having an occupation that involved exposure to lead: painter/decorator (7 cases), foundry worker (6 cases), radiator fitter/repairer (4 cases), factory worker (2 cases), cleaner, electrician, fitter/welder, lead lighter, plumber, scrap metal worker (1 case each), and not specified (23 cases).

NEW, EXOTIC & IMPORTED INFECTIONS

Hepatitis A

- *Notifications:* 55 notifications in the quarter (2011, 8); 73 notifications over the last 12 months (2011, 41), giving a rate of 1.7 cases per 100,000 population (2011, 0.9), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (6 cases) and from the same quarter last year (8 cases). Cases were aged between 14 months and 86 years, with 38 cases under the age of 16 years. Overseas travel information was recorded for 49 cases (89.1%). Of these, 33 (67.3%) cases had not travelled overseas during the incubation period of the disease.

3. Other Surveillance Reports

Salmonella infection in New Zealand dairy cows – collaboration at the human-animal health interface

Salmonella is an important cause of gastroenteritis in New Zealand. In 2010, 1146 human cases of salmonellosis were notified, making it the second most frequently notified bacterial disease. Most cases are attributed to food-borne transmission, but there is increasing concern about the role of environmental exposure pathways in this zoonotic disease.[1] Rural living is associated with salmonellosis. Notification and hospitalisation data from 1997 to 2008 show higher rates of salmonellosis in rural areas compared to urban areas, with a trend of higher incidence as the grade of rurality increased.[2] We report on recent *Salmonella* outbreaks in New Zealand dairy cows to encourage further collaboration across animal and human health disciplines.

Salmonellosis in New Zealand dairy cows usually presents as a sporadic disease and typically, outbreaks involve a few cows with a high case fatality rate. In late 2011 and early 2012, Taranaki veterinarians were concerned about the increasing number of salmonellosis cases in dairy herds and a change in their usual presentation.[3] The pattern of illness was of higher morbidity and lower mortality. Herds were severely affected with reduced milk production, diarrhoea, weight loss and death. This regional outbreak was not an isolated event and occurred against a background of an increase in reported salmonellosis cases in North Island dairy herds since 2009.[4] In affected areas of the North Island, mixed serovars were isolated and cases were more frequent when cows were in transition between late pregnancy and peak lactation (late winter/spring). This suggested the influence of predisposing risk factors for infection with endemic serovars, rather than the introduction of an exotic or novel serovar. The 'Salmonellosis Liaison Group', chaired by the New Zealand Veterinary Association (NZVA), was formed in January 2012 with representatives from the NZVA, the Ministry for Primary Industries (formerly Ministry of Agriculture and Forestry), Fonterra, Taranaki veterinarians and Massey University's EpiCentre.

A study of 16 case (identified between October and December 2011) and 16 control herds drawn from four veterinary practices was conducted in Taranaki in December 2011. This identified an association between affected herds and the use of mineral supplements, home mixing of minerals and feeding of supplements other than palm kernel meal. This information was disseminated to the veterinary profession and farmers through the NZVA and the rural media. A questionnaire for a larger nationwide case-control study of up to 65 case and 130 control herds is currently being finalised. An initial report, releasing key findings, will be presented at the NZVA conference in June 2012.

Salmonellosis outbreaks continue to occur in many dairying regions. In addition to animal health concerns, these outbreaks represent a risk of zoonotic spread to humans. Given that affected animals shed the

bacteria in their faeces for prolonged periods after the clinical signs have abated, it is important to raise awareness of this issue among dairy farming families, farm workers and the health professionals attending them. In Taranaki, the public health unit issued an alert to primary care physicians to request stool samples from those patients with signs and symptoms of salmonellosis, particularly from rural dwellers or farm workers.

Pathways for zoonotic transmission include direct and indirect contact with cattle faeces. Dairy farmers often spread effluent over pastures, which could, in turn, run off into waterways or be spread by wild birds to roofs where rainwater is collected and consumed, often without treatment. Furthermore, free range poultry could become infected while foraging over paddocks where cattle have grazed. Another common dairy farming practice is drinking unpasteurised milk. This was a risk factor in a previously reported cluster of four human cases linked to one lower North Island dairy farm with cows clinically ill with *Salmonella* Typhimurium phage type 156 infection.[5]

Recent molecular typing work from ESR's Enteric Reference Laboratory has been crucial in working towards establishing the potential link between human and bovine isolates of *Salmonella*. For example from 1 January to 1 March 2012 an increase in human isolates of *Salmonella* Typhimurium phage type 23 (STM 23) was notified in the Auckland region. Molecular typing using pulsed-field gel electrophoresis (PFGE) was performed on human and bovine STM 23 isolates from the same region. Results indicated that the human PFGE profile was indistinguishable from those associated with bovine cases, and that this PFGE profile had previously been seen in New Zealand, in both human and bovine isolates of STM 23.

Epidemiological links between human and animal cases of salmonellosis can only be made if there is effective diagnosis of both humans and animals, and clear communication between human and animal health professionals. Maintaining the identification of a bovine faecal sample as one that is associated with an outbreak has been identified as an important factor during the recent Taranaki outbreak. Bovine faecal samples from the farm go via veterinarian to the animal health laboratory, and resultant *Salmonella* isolates are transported to the ESR's Enteric Reference Laboratory for typing. For linkages to be established between bovine and human cases the bovine case information needs to accompany the isolate. Similarly, identifying the occupation of and risk factors for human cases, including drinking unpasteurised milk or untreated water, will enhance our future knowledge of the sources and pathways for zoonotic disease.

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

Reported by Jackie Benschop, Health Intelligence Team, ESR and EpiCentre, Institute of Veterinary, Animal and Biomedical Sciences, Massey University; Muriel Dufour, NCBID Microbiology, Health Programme, ESR; Greg Simmons, Public Health Unit, Taranaki District Health Board; Mark Stevenson, EpiCentre, Institute of Veterinary, Animal and Biomedical Sciences, Massey University.

A case of hepatitis E from the Wellington region

Regional Public Health received a notification on 16 March 2012 of a confirmed case of hepatitis E in an Indian male, following serological diagnosis in Australia. This is the first case of hepatitis E notified in the Wellington region.

The man had been quite ill with jaundice, had highly elevated liver function test results and had been hospitalised for seven days. He was treated as a case of presumed hepatitis E until the serology was confirmed. The case had travelled to India with his family and probably became infected in his home town. According to the case, the town's drinking-water is unsafe and the whole family drank bottled water, except on one occasion when the case consumed water from a domestic tap that was not fitted with a filter. Faecally-contaminated drinking-water is the most commonly documented transmission vehicle for hepatitis E.[1] When interviewed, the man's four household contacts were healthy. However, prophylaxis could not be provided as human immunoglobulin is ineffective, and a vaccine is not available.

ESR's EpiSurv records show hepatitis E cases (as distinct from hepatitis not otherwise specified) have been notified in New Zealand at a frequency of only one, or less often two, per year since 2003. In 2011, however, five cases were notified in the Auckland region. Of these, four were reported as having travelled overseas (with one case to India), and the fifth case was reported as having unknown overseas travel. Since 2003, there have been seven cases of hepatitis E in New Zealand who had travelled to India. It appears likely that hepatitis E is not circulating in New Zealand.

The clinical course of hepatitis E is similar to that of hepatitis A, with no evidence of a chronic form. The case fatality rate is similar to that of hepatitis A, except in pregnant women where it may reach 20% among women infected during the third trimester of pregnancy.

Humans are the natural hosts for hepatitis E, although some monkeys and chimpanzees can become infected, and possibly cows, sheep, goats, and pigs. These animals may infect humans zoonotically, with some studies suggesting that hepatitis E may be a zoonotic infection with coincident areas of high human infection.[1,2] Hepatitis E is mainly transmitted via the faecal-oral route. Person-to-person transmission probably also occurs through the same route, but unlike hepatitis A, it is not common for hepatitis E to be contracted by members of the households of infected individuals.

Hepatitis E virus is the major causal agent of enterically transmitted non-A, non-B hepatitis worldwide. Hepatitis E infection should be suspected when a case presents with a clinically compatible illness, non-A, non-B, non-C serology, and a history of overseas travel, particularly to areas were hepatitis E is highly endemic, including India and Pakistan, Nepal, many African countries, Greece, southern Russia, Myanmar, Indonesia, and China.

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

Reported by Quentin Ruscoe, Health Protection Officer, Disease Control Portfolio, Regional Public Health

4. Outbreak Surveillance

The following information is a summary of the outbreak trends for New Zealand from data collected in the last quarter (January to March 2012). Comparisons are made to the previous quarter (October to December 2011), and to the same quarter in the previous year (January to March 2011). Note that the outbreak data in this section are notified to ESR by the Public Health Services.

General

- 118 outbreaks notified in this quarter (674 cases).
- 64 are 'final' reports (435 cases); 54 are 'interim' reports (239 cases) that have yet to be finalised and closed.

All data that follow relate to final reports only.

- 6.8 cases on average per outbreak, compared with 11.2 cases per outbreak in the previous quarter (11.1 cases per outbreak in the same quarter of last year).
- 9 hospitalisations: 'gastroenteritis' (5 cases), rotavirus (2 cases), norovirus, and *Salmonella* Paratyphi (1 case each).
- No deaths.

Pathogens

- 15 'gastroenteritis' outbreaks (80 cases).
- 14 *Giardia* outbreaks (48 cases).
- 11 norovirus outbreaks (209 cases).
- 5 *Campylobacter* outbreaks (22 cases).
- 5 *Salmonella* outbreaks (15 cases).
- 4 *Bordetella pertussis* outbreaks (17 cases).
- *2 rotavirus outbreaks (21 cases).*
- *2 Shigella outbreaks* (4 cases).

- 1 *Cryptosporidium* outbreak (7 cases).
- 1 histamine (scombroid) fish poisoning outbreak (2 cases).
- 1 lead poisoning outbreak (2 cases).
- 1 *Plesiomonas shigelloides* outbreak (3 cases).
- 1 *S.* Paratyphi outbreak (2 cases).
- 1 *Yersinia* outbreak (3 cases).

Modes of Transmission

Note that reporting allows for multiple modes of transmission to be selected. In some instances no modes of transmission are selected for outbreaks notified to ESR.

- 44 person-to-person, from (non-sexual) contact with an infected person (including droplets): 11 norovirus (209 cases), 9 *Giardia* (31 cases), 8 'gastroenteritis' (52 cases), 4 *B. pertussis* (17 cases), 4 *Campylobacter* (20 cases), 3 *Salmonella* (10 cases), 2 rotavirus (21 cases), 1 *Cryptosporidium* (7 cases), 1 *Shigella* (2 cases), and 1 *Yersinia* (3 cases).
- 9 foodborne, from consumption of contaminated food or drink (excluding water): 3 *Campylobacter* (16 cases), 1 'gastroenteritis' (4 cases), 1 *Giardia* (2 cases), 1 histamine (scombroid) fish poisoning (2 cases), 1 *P. shigelloides* (3 cases), 1 *S.* Paratyphi (2 cases), and 1 *Shigella* (2 cases).
- 8 waterborne, from consumption of contaminated drinking water: 4 *Giardia* (11 cases), 2 *Campylobacter* (4 cases), 1 *Cryptosporidium* (7 cases), and 1 *Salmonella* (3 cases).
- 6 environmental, from contact with an environmental source (e.g., swimming): 2 *Campylobacter* (13 cases), 2 norovirus (22 cases), 1 *Cryptosporidium* (7 cases), and 1 lead poisoning (2 cases).
- 3 zoonotic, from contact with infected animal: 1 *Campylobacter* (2 cases), 1 *Giardia* (2 cases), and 1 'gastroenteritis' (3 cases).
- 3 'other' modes: 1 norovirus (47 cases), 1 rotavirus (16 cases), and 1 *Yersinia* (3 cases).
- 11 mode of transmission unknown: 6 'gastroenteritis' (24 cases), 3 *Giardia* (10 cases), 1 *Salmonella* (2 cases), and 1 *Shigella* (2 cases).

Circumstances of Exposure

Common 'settings' where the exposures occurred are identified below.

- 28 home: 11 *Giardia* (37 cases), 4 B. pertussis (17 cases), 3 *Campylobacter* (8 cases), 3 *Salmonella* (10 cases), 4 'gastroenteritis' (13 cases), 2 norovirus (17 cases), and 1 *Yersinia* (3 cases).
- 10 long term care facility: 6 norovirus (118 cases), 3 'gastroenteritis' (25 cases), and 1 *Campylobacter* (11 cases).
- 5 childcare centre: 3 'gastroenteritis' (16 cases) and 2 rotavirus (21 cases).
- 4 restaurant/café/bakery: 2 'gastroenteritis' (4 cases), 1 *Campylobacter* (3 cases), and 1 histamine (scombroid) fish poisoning (2 cases).
- 3 takeaways: 3 'gastroenteritis' (9 cases).
- 1 camp: norovirus (45 cases).
- 1 farm: *Giardia* (5 cases).
- 1 hospital (acute care): norovirus (17 cases).
- 1 prison: norovirus (12 cases).
- 1 workplace: lead poisoning (2 cases).
- 3 'other setting': 2 'gastroenteritis' (18 cases) and 1 *Cryptosporidium* (7 cases).
- 2 outbreaks had two exposure settings recorded.
- 8 outbreaks had no exposure settings recorded.

Common 'settings' where the preparations occurred are identified below.

- 2 restaurant/café/bakery: 1 *Campylobacter* (3 cases) and 1 histamine (scombroid) fish poisoning (2 cases).
- 2 home: 1 *Campylobacter* (2 cases) and 1 *Giardia* (2 cases).
- 1 long term care facility: *Campylobacter* (11 cases).
- 1 takeaways: 'gastroenteritis' (4 cases).

5. Outbreak Case Reports

The 2011–2012 pertussis outbreak in the Nelson-Marlborough region

Introduction

The Nelson Marlborough District Health Board (NMDHB) population is experiencing a significant outbreak of pertussis with the highest number of cases notified among all district health boards (DHB) in New Zealand for 2011, and the second highest notification rate after the West Coast DHB. The outbreak has continued into the first quarter of 2012.

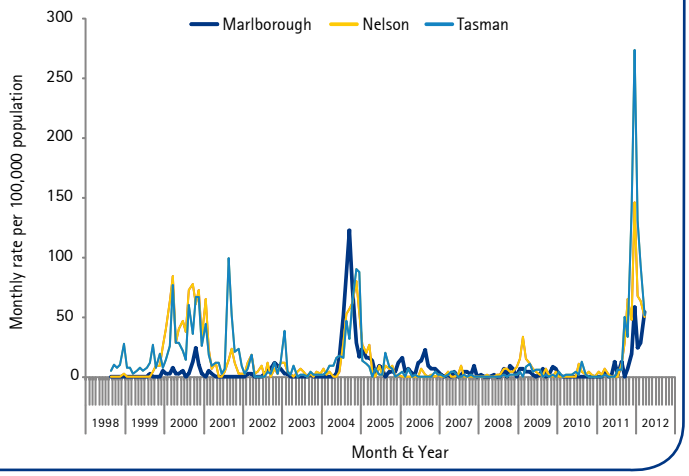
Pertussis outbreaks tend to recur on a 3 to 5 year cycle. Pertussis infections are most serious in infants, particularly among those aged less than 6 months who are at the greatest risk of hospitalisation, complications and death.

This article briefly describes the epidemiology of the current pertussis outbreak and compares it with previous outbreaks in the Nelson-Marlborough region and national rates of pertussis notifications.

Epidemiology of the outbreaks in the Nelson-Marlborough region

The NMDHB encompasses Marlborough District Council, Nelson City Council and Tasman District Council territorial authorities (TA). The populations of these TAs are comparable in terms of size and socio-demographic characteristics, although Nelson is predominantly urban, while the others are mixed urban-rural. Figure 1 shows the monthly notification rates for pertussis in the three TAs from August 1998 to March 2012. Major outbreaks occurred from 1999 to 2001, 2004 to 2005 and 2011 to 2012, with a smaller outbreak in 2009.

Figure 1. Notified pertussis cases in Nelson-Marlborough, monthly rates per 100,000 population by territorial authority area, 1998 to 2012



The four outbreaks in Nelson-Marlborough differ significantly in size across the three TA areas (Table 1). During the current outbreak there has been a much higher notification rate from the Tasman area, with relatively few cases notified from the Marlborough district. The current outbreak is significantly larger than previous Nelson-Marlborough outbreaks, in terms of the mean monthly notification rates and the peak notification rates. For all of the outbreaks, the mean monthly notification rates for Nelson-Marlborough have been significantly higher than the New Zealand mean monthly notification rates for the same periods.

Table 1. Characteristics of four pertussis outbreaks in Nelson-Marlborough from 1999 to 2012, comparing mean and peak monthly notification rates across territorial authority areas and with national mean monthly notification rates

		Epidemic/Outbreak			
		1999–2001	2004–2005	2009	2011–2012
Outbreak period[1]		Nov 1999–Feb 2001; Aug–Nov 2001	Jun 2004–Mar 2005	Jan–April 2009	Aug 2011–Mar 2012 (ongoing)
Length of outbreak (months)		20	10	4	8 (ongoing)
Total number of cases in Nelson-Marlborough		705	546	55	688 (ongoing)
Mean monthly rates per 100,000 population (number of cases)	Marlborough Nelson Tasman New Zealand	4.2 (34) 41.7 (355) 37.9 (316) 7.0 (5356)	45.5 (193) 41.4 (181) 38.7 (172) 9.8 (3970)	5.6 (10) 18.9 (34) 5.8 (11) 2.5 (432)	25.7 (94) 59.9 (220) 97.6 (374) 8.0 (2818)
Peak monthly rates per 100,000 population	Marlborough Nelson Tasman	24.8 84.6 76.8	122.5 80.0 87.8	8.9 33.3 10.7	59.0 146.0 273.5

Data source is EpiSurv, extracted 3 April 2012.

[1] Outbreak is defined as a period (> 3 months) for which total cases in Nelson-Marlborough continuously exceeded 10 cases per month with a peaking pattern.

Denominator populations used to calculate notification rates were estimated sub-national and national populations derived from the 1996, 2001 and 2006 New Zealand Census of Population and Dwellings, published by Statistics NZ.

Discussion

The unequal distribution of pertussis notification rates among the three TA areas within Nelson-Marlborough during the different outbreaks suggests a tendency for pertussis notifications to cluster locally within larger populations. However, since the current outbreak is still evolving, there may be some change in the final distribution of cases among the TAs.

The relatively high notification rates of pertussis in the current outbreak in the NMDHB region, particularly in the Tasman area, are not explained by differences between Nelson-Marlborough and the rest of New Zealand in terms of the ethnicity or deprivation profiles at the total population level, or by the assumed overall immunisation coverage (as reflected by the National Immunisation Register 2 year old coverage rate for the second quarter 2011–2012). Given the overall lower levels of deprivation in the Nelson-Marlborough area compared with the rest of New Zealand, it is possible that greater access to primary care may contribute to the higher notification rates. Furthermore, Nelson-Marlborough's higher proportion of older people (compared with most other New Zealand districts) may provide a larger susceptible pool of adults whose immunity has waned. This may lead to more undiagnosed infections causing increased transmission of disease to younger age groups. Finally, Nelson-Marlborough has a higher immunisation decliner rate than the New Zealand average, and this may underlie local clustering of the disease in specific communities.

Further investigation of pertussis in the Nelson-Marlborough region is planned, focussing on local clustering patterns, immunisation coverage and other susceptibility factors in specific communities, particularly in the Tasman area.

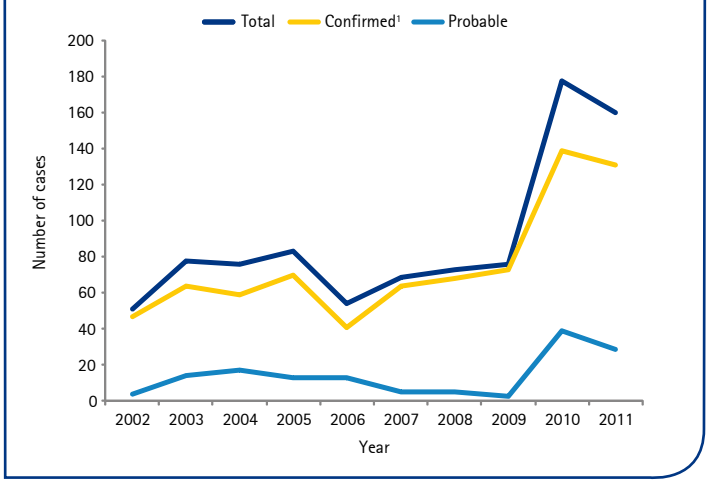
Reported by Alan Norrish, Public Health Analyst and Jill Sherwood, Medical Officer of Health, Nelson Marlborough District Health Board.

6. Laboratory Surveillance

Laboratory-based legionellosis surveillance, 2011

Legionellosis has been a notifiable disease in New Zealand since 1980. Laboratory-based surveillance and laboratory testing on referred clinical specimens has been carried out at ESR since 1978. From 2010 to 2011, there has been a significant increase in the number of laboratory-reported legionellosis cases, with a record high of 178 cases identified in 2010 and a slight decrease to 160 cases identified in 2011 (Figure 2). The annual average number of cases for the last two years is 169 per year compared with 70 cases per year for the previous eight-years (2002 to 2009). There are no known causes for the increase in cases, but it could be due in part to increased laboratory use of nucleic acid amplification testing (NAAT), reflecting greater awareness of alternative testing methods for the disease rather than relying on the traditional antibody serology methods. Furthermore, the increase in annual case numbers for legionellosis coincides with an increased number of compost-related exposures.

Figure 2. Number of laboratory-proven legionellosis cases, 2002 to 2011

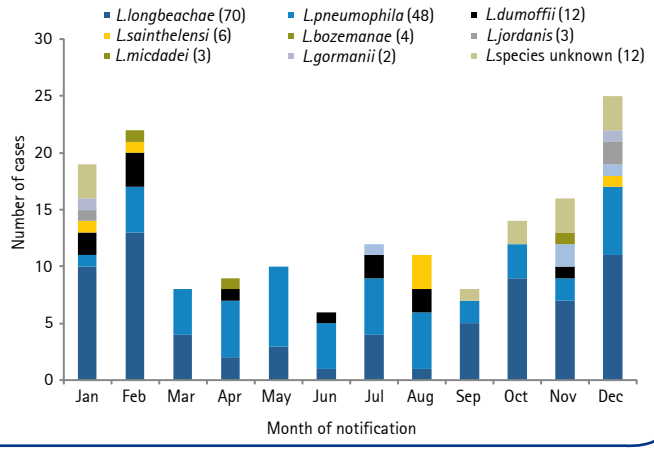


[1] A confirmed case is defined as having a clinically compatible illness and a positive laboratory test for either *Legionella* culture or a four-fold rise in antibody titre by IFA test or a sustained elevated titre >256 or a positive *Legionella* urinary antigen test. A probable case is defined as having a clinically compatible illness and either a positive *Legionella* NAAT result or a single antibody titre >256 by IFA test.

There appears to be a geographical difference in case occurrence with 67 (78.8%) cases in the South Island compared with 18 (21.2%) cases in the North Island. These cases have primarily been reported from the Canterbury District Health Board (DHB), which has reported 49 (57.6%) of these cases. Disease incidence rates for the different DHB areas show that all those in the South Island with more than four notified cases, had rates ranging from a low of 4.6 per 100,000 population (Southern DHB) to a high of 11.7 per 100,000 (Canterbury DHB). These rates are significantly higher than the rates seen for the DHB areas in the North Island with rates between 1.9 and 3.8 per 100,000 population. For a table summarising all laboratory-proven cases of legionellosis for 2011, broken down by DHB, case status and exposure source refer to http://www.surv.esr.cri.nz/surveillance/NZPHSR.php

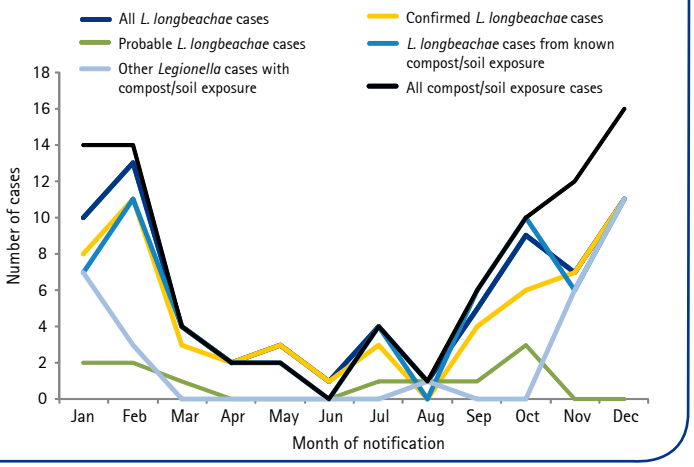
In 2011, the most prevalent legionellosis causative agent identified by laboratory testing of clinical samples was *Legionella longbeachae* with 70 (43.7%) cases, followed by *Legionella pneumophila* with 48 (30.0%) cases. Source tracing identified 85 (53.1%) legionellosis cases with exposure to compost, potting mix or other gardening activity during the incubation period. Of these, 63 (74.1%) cases were diagnosed with a *L. longbeachae* infection, with 22 (25.9%) of these cases occurring between 1 January and 31 March 2011, and a further 33 (38.9%) cases occurring between 1 September and 31 December 2011 (Figures 3 and 4). Source tracing has highlighted that compost harbours *Legionella* species other than *L. longbeachae*. Infections with *L. dumoffii* (4 cases), *L. bozemanae*, *L. jordanis, L. micdadei* (2 cases each), *L. gormanii*, and *L. pneumophila* (1 case each) occurred following exposure to compost. The exposure source was identified for only 16 of the 48 *L. pneumophila* cases, with a cooling tower implicated for six cases (associated with the Blenheim outbreak), spa pools associated with a further three cases, compost implicated in one case and foreign travel implicated in six cases.

Figure 3. Number of legionellosis cases by month[1], 2011



[1] Annual counts for each *Legionella* species shown brackets in figure legend.

Figure 4. Number of *Legionella longbeachae* & compost exposure cases by month, 2011



One single-source legionellosis outbreak was identified in 2011, with the source traced to a cooling tower in Blenheim. The outbreak was caused by *Legionella pneumophila* serogroup 1 and involved six confirmed cases, diagnosed using either the *Legionella* urinary antigen test or by indirect immunofluorescence antibody serology. Five males and one female were involved in this outbreak, with an age range of 30 to 64 years. All cases worked in close proximity to the cooling tower and all of the onset dates were within a three-week period. As a result of the outbreak, the legionellosis case rate for Nelson-Marlborough DHB was significantly higher than many other DHBs at 7.2 cases per 100,000 population.

A total of 24 cases were laboratory-confirmed by culture, which is still considered the gold standard test for the diagnosis of legionellosis. All laboratories are encouraged to culture respiratory samples from patients suspected of having legionellosis. A further 107 cases were laboratory-confirmed following either a positive *Legionella* urinary antigen test (19 cases), or a four-fold or greater rise in antibody titres (31 cases), or antibody titres greater than 512 on more than one occasion (46 cases), or a NAAT-positive test on acute phase samples and a serologically positive test on convalescent samples (11 cases).

A legionellosis case diagnosed solely by a positive NAAT result only fits the probable case definition. Of the 160 laboratory-proven cases in 2011, 57 were initially detected on the basis of a positive NAAT result. Following further supporting laboratory tests (usually a combination of culture and/or serology) most were confirmed, but 18 (11.2%) remain as probable cases. This represents a large increase in probable case numbers compared with previous years from 2002 to 2009, when only two to three probable cases were diagnosed each year based on positive *Legionella* NAAT results. A further 11 cases remained probable on the basis of either a single elevated antibody titre of at least 512 (7 cases) or only demonstrating a doubling in antibody titres to 512 on paired sera (4 cases).

Molecular methods are much more sensitive for legionellosis diagnosis compared with culture methods. The use of polymerase chain reaction testing has again highlighted the historical under-reporting of legionellosis cases. As more laboratories adopt routine *Legionella* molecular testing for patients admitted to hospital with unexplained community-acquired pneumonia, it is expected that greater numbers of cases will be detected compared with previous years. However, inherent issues around false-positive results associated with *Legionella* NAAT methods means that any positive result needs to be interpreted with caution and appropriate follow-up testing must be carried out to confirm the diagnosis and identify the infecting *Legionella* species.

Reported by David Harte, 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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Scientific Editor,
New Zealand Public Health Surveillance Report, ESR,
PO Box 50-348, Porirua, Wellington, New Zealand.
Phone: (04) 914 0700; Fax (04) 914 0770;
Email: survqueries@esr.cri.nz

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