Volume 13 Issue 2

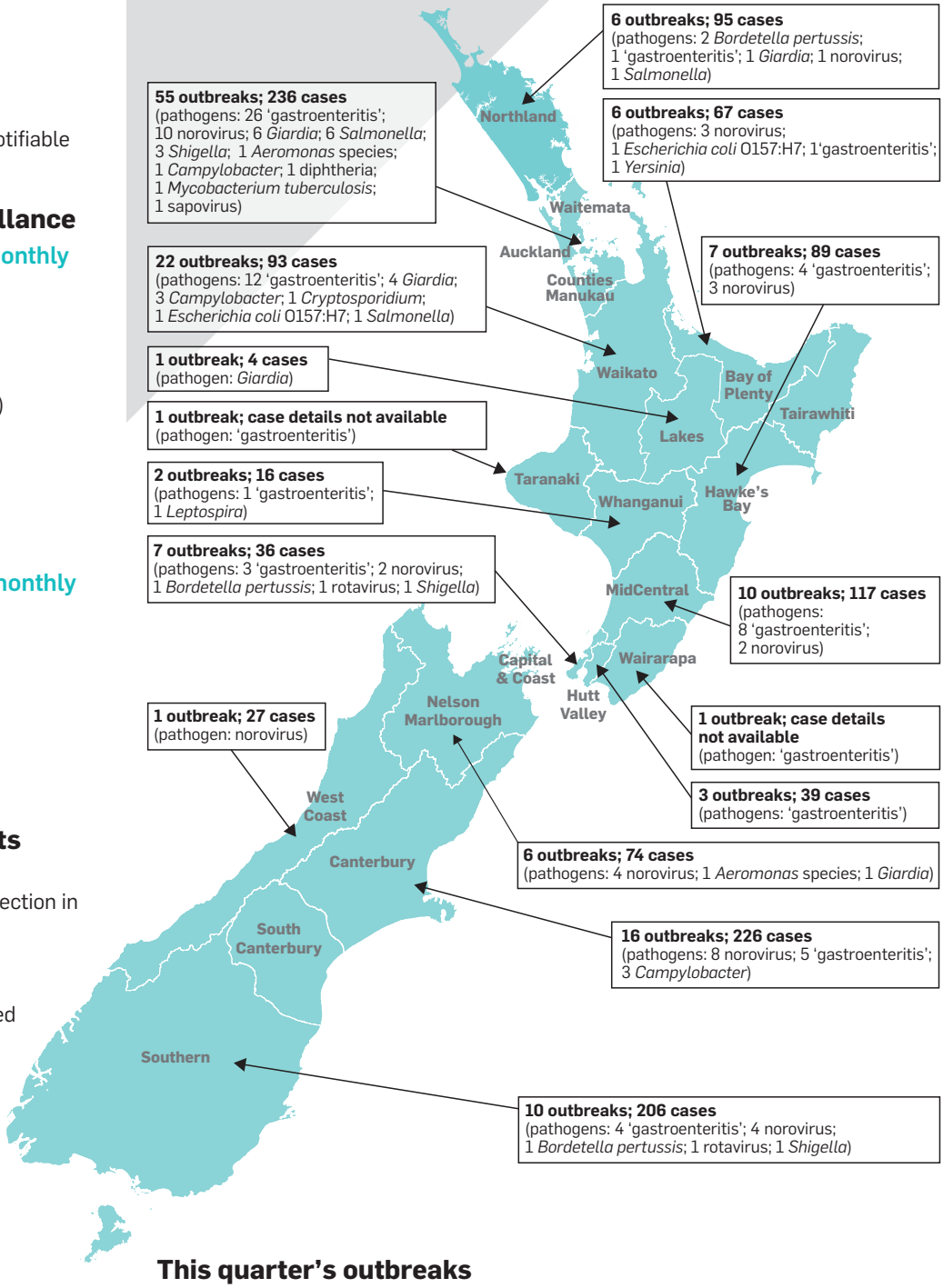
NEW ZEALAND

Public Health Surveillance Report

June 2015: Covering January to March 2015

CONTENTS AND HIGHLIGHTS

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



This quarter's outbreaks

Notification and outbreak data in this issue is drawn from the January to March quarter of 2015. 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 7 April 2015. Outbreaks reporting exposures in more than one geographic location are assigned to the district health board with the most cases. Three outbreaks involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to group totals.

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1. EDITORIAL

A summary of the key trends in notifiable diseases for 2014

A total of 15,045 notifiable disease cases were notified through EpiSurv, New Zealand's notifiable disease database in 2014, compared with 17,693 in 2013.

From 2013 to 2014, there were decreases in most enteric diseases, including a significant decrease in notified cases of cryptosporidiosis. There were also decreases for most vaccine preventable diseases, excluding measles. A significant increase in notified cases of yersiniosis and acute gastroenteritis together with an increase in notified cases of arboviral disease (including Chikungunya, dengue and Zika fevers) was observed from 2013 to 2014.

Enteric diseases

There were decreases in most enteric diseases from 2013 to 2014, with the exception of yersiniosis and acute gastroenteritis. There was a significant increase in notified cases of yersiniosis in 2014 (682 cases, 15.1 per 100,000 population) compared with 2013 (484 cases, 10.9 per 100,000). This was also the highest yearly total since yersiniosis was made notifiable in 1996. There were seven outbreaks of *Yersinia* spp. involving 246 cases reported during 2014 (compared with three outbreaks involving 13 cases in 2013). One outbreak involving 220 cases was caused by *Yersinia pseudotuberculosis*. A significant increase in notified cases of acute gastroenteritis was also observed, with 755 cases in 2014 (16.7 per 100,000) compared with 558 cases in 2013 (12.6 per 100,000).

A significant decrease in notified cases was observed for cryptosporidiosis, from 1348 in 2013 (30.3 per 100,000) to 584 in 2014 (12.9 per 100,000). The usual autumn peak in notified cases of cryptosporidiosis was not observed in 2014, although the usual spring peak was observed. Fewer outbreaks of cryptosporidiosis were reported in 2014 (20 outbreaks, involving 60 cases), compared with 2013 (99 outbreaks, involving 550 cases). A significant decrease in notified cases was also observed for salmonellosis, from 1143 in 2013 (25.7 per 100,000) to 954 in 2014 (21.2 per 100,000).

Campylobacteriosis accounted for 45% of all notifications in 2014, despite a decrease in cases (6776 cases, 150.3 per 100,000) compared with 2013 (6837 cases, 153.9 per 100,000). The total number of campylobacteriosis cases for 2014 was less than half the number of cases seen during the peak in 2006 (15,873 cases).

Vaccine-preventable diseases

There were decreases in notified cases for the following vaccine-preventable diseases: meningococcal disease, mumps and pertussis. In particular, meningococcal disease and pertussis cases decreased significantly from 2013 to 2014. There were only 46 cases (1.0 per 100,000) of meningococcal disease notified during 2014, down from 68 cases (1.5 per 100,000) in 2013. Notified cases of pertussis decreased significantly from 3540 cases (79.7 per 100,000) in 2013 to 1127 cases (25.0 per 100,000) in 2014.

A significant increase in notified cases of measles was observed, from eight cases in 2013 (0.2 per 100,000) to 280 cases in 2014 (6.2 per 100,000). Nineteen measles outbreaks were reported in 2014, involving 243 cases. There was a small increase in notified cases of invasive pneumococcal disease, from 479 cases in 2013 (10.8 per 100,000) to 508 cases in 2014 (11.3 per 100,000).

Exotic diseases

There was a significant increase in the number of notified cases of several arboviral diseases from 2013 to 2014 (Chikungunya, dengue and Zika fevers). All of the notified cases had travelled overseas during the incubation periods of the diseases.

There was a significant increase in notified cases of dengue fever in 2014 (179 cases, 4.0 per 100,000) compared to 2013 (106 cases, 2.4 per 100,000).

In 2014, 44 cases (1.0 per 100,000) of Chikungunya fever were notified compared with one case in 2013. Prior to 2014 only five cases had been notified, one case each year in 2007, 2008, 2009, 2011 and 2013. In 2014, 57 cases (1.3 per 100,000) of Zika fever were notified.

Six cases of murine typhus (a rickettsial disease) were notified in 2014. Five of these cases are assumed to have acquired their infection in New Zealand.

Four cases of leprosy were notified during 2014 compared with seven cases in 2013. All cases were overseas during the incubation period of the disease. The countries lived in or visited by the cases were Samoa (3 cases) and Cook Islands (1 case).

Outbreaks

In 2014, there was an increase in the number of outbreaks and the number of associated cases (863 outbreaks, 14,828 cases) compared with 2013 (651 outbreaks, 7143 cases). Over the 10-year period between 2005 and 2014, there has been an increasing trend in the number of outbreaks reported.

The most common pathogens implicated in outbreaks in 2014 were norovirus (322 outbreaks, 9363 cases), gastroenteritis (243 outbreaks, 2898 cases), *Giardia* spp. (85 outbreaks, 317 cases) and rotavirus (48 outbreaks, 866 cases).

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

Reported by the Health Intelligence Team, Health Group, ESR.

2. NOTIFIABLE DISEASE SURVEILLANCE

The following is a summary of disease notifications for the January to March quarter of 2015 and cumulative notifications and rates calculated for a 12-month period (April 2014 to March 2015). 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 is based on information recorded in EpiSurv by public health service staff up to 7 April 2015. 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 diseases

Invasive pneumococcal disease

- ***Notifications:*** 64 notifications in the quarter (2014, 77); 495 notifications over the last 12 months (2014, 479), giving a rate of 11.0 cases per 100,000 population (2014, 10.8), not a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (133 cases). Cases were aged between 5 months and 91 years, with 3 cases aged less than 2 years.

Measles

- ***Notifications:*** 3 notifications in the quarter (2014, 111); 172 notifications over the last 12 months (2014, 118), giving a rate of 3.8 cases per 100,000 population (2014, 2.7), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the same quarter last year (111 cases). One case was aged less than 15 months. Two cases were confirmed. The remaining case was under investigation.

Pertussis

- ***Notifications:*** 213 notifications in the quarter (2014, 346); 966 notifications over the last 12 months (2014, 2532), giving a rate of 21.4 cases per 100,000 population (2014, 57.0), a statistically significant decrease.
- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (259 cases) and from the same quarter last year (346 cases).

Enteric infections

Campylobacteriosis

- ***Notifications:*** 1549 notifications in the quarter (2014, 1817); 6514 notifications over the last 12 months (2014, 7020), giving a rate of 144.4 cases per 100,000 population (2014, 158.0), a statistically significant decrease.

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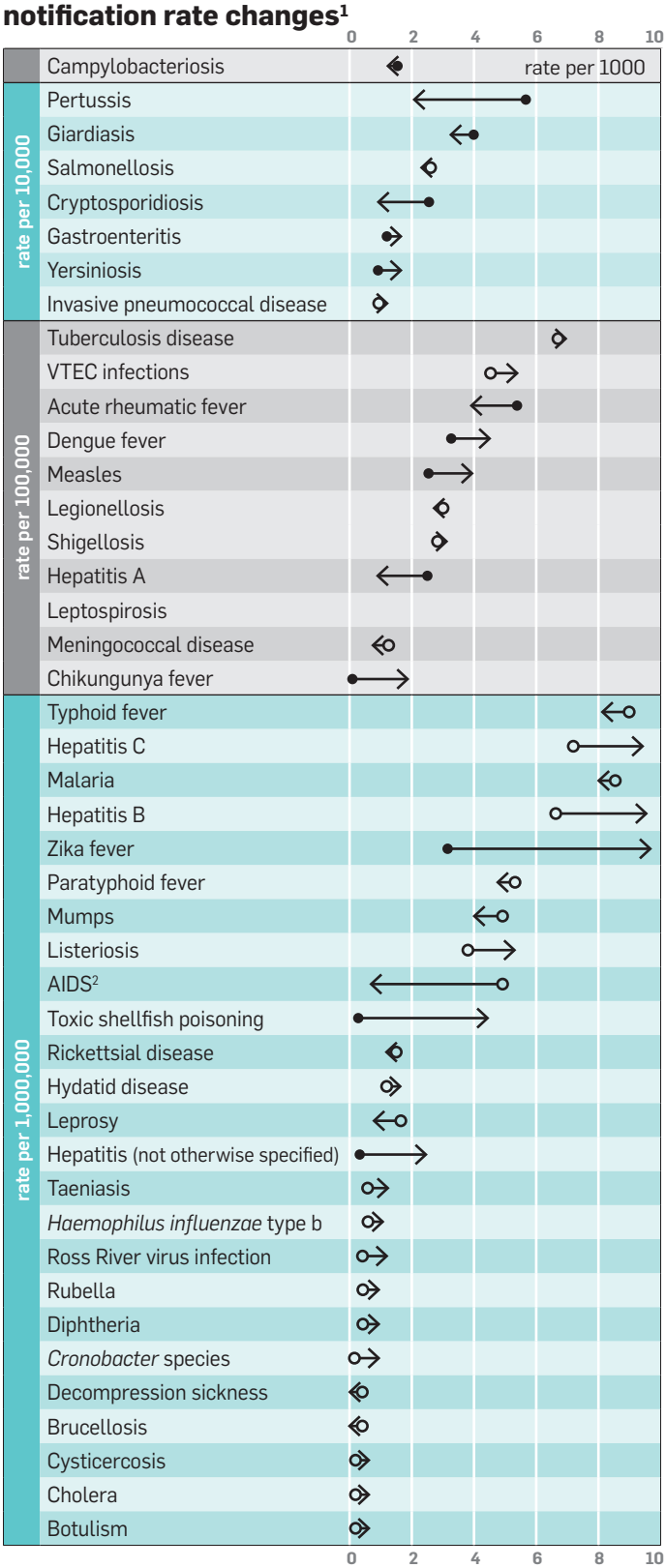
National surveillance data 12-monthly notification rate changes[1]



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 2014 to March 2015 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.

- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (2351 cases) and from the same quarter last year (1817 cases).

Gastroenteritis (acute)

- ***Notifications:*** 119 notifications in the quarter (2014, 170); 704 notifications over the last 12 months (2014, 589), giving a rate of 15.6 cases per 100,000 population (2014, 13.3), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (222 cases) and from the same quarter last year (170 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 unless they meet the criteria above 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:*** 356 notifications in the quarter (2014, 280); 1030 notifications over the last 12 months (2014, 1071), giving a rate of 22.8 cases per 100,000 population (2014, 24.1), not a statistically significant decrease.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (232 cases) and from the same quarter last year (280 cases).

VTEC infections

- ***Notifications:*** 82 notifications in the quarter (2014, 52); 217 notifications over the last 12 months (2014, 198), giving a rate of 4.8 cases per 100,000 population (2013, 4.5), not a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (39 cases) and from the same quarter last year (52 cases).

Yersiniosis

- ***Notifications:*** 135 notifications in the quarter (2014, 123); 694 notifications over the last 12 months (2014, 495), giving a rate of 15.4 cases per 100,000 population (2014, 11.1), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (249 cases).

Infectious respiratory diseases

Acute rheumatic fever

- ***Notifications:*** 30 notifications in the quarter (2014, 56); 180 notifications over the last 12 months (2014, 220), giving a rate of 4.0 cases per 100,000 population (2014, 5.0), a statistically significant decrease.
- ***Comments:*** there has been a statistically significant quarterly decrease from the same quarter last year (56 cases). Cases were distributed by age as follows: 1 (1–4 years), 10 (5–9 years), 11 (10–14 years), and 8 (15 years and over). 27 cases were an initial attack of acute rheumatic fever and 3 cases were recurrent attacks.
- ***Note:*** this information is based on report date and may not reflect the actual onset of acute rheumatic fever. This information should not be used to assess trends in the disease rates over time.

Environmental exposures & infections

Cryptosporidiosis

- ***Notifications:*** 77 notifications in the quarter (2014, 82); 579 notifications over the last 12 months (2014, 1044), giving a rate of 12.8 cases per 100,000 population (2014, 23.5), a statistically significant decrease.
- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (238 cases).

Giardiasis

- ***Notifications:*** 406 notifications in the quarter (2014, 475); 1640 notifications over the last 12 months (2014, 1774), giving a rate of 36.4 cases per 100,000 population (2014, 39.9), a statistically significant decrease.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (345 cases) and a significant quarterly decrease from the same quarter last year (475 cases).

Leptospirosis

- ***Notifications:*** 29 notifications in the quarter (2014, 6); 79 notifications over the last 12 months (2014, 55), giving a rate of 1.8 cases per 100,000 population (2014, 1.2), a statistically significant increase.
- ***Comments:*** there has been a significant quarterly increase from the same quarter last year (6 cases). There were 27 male and 2 female cases. 15 cases were recorded as having an occupation identified as high risk for exposure. The recorded occupations were farmer or farm worker (13 cases) and meat process worker (2 cases).

Toxic shellfish poisoning

- ***Notifications:*** 2 notifications in the quarter (2014, 1); 19 notifications over the last 12 months (2014, 1), giving a rate of 0.4 cases per 100,000 population, a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (14 cases).

New, exotic & imported infections

Chikungunya fever

- ***Notifications:*** 36 notifications in the quarter (2014, 0); 80 notifications over the last 12 months (2014, 1), giving a rate of 1.8 cases per 100,000 population, a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the same quarter last year (no cases). 32 cases were laboratory confirmed. All cases had travelled overseas during the incubation period of the disease. The most commonly visited countries were Samoa (27 cases), French Polynesia and Kiribati (3 cases each).

Dengue fever

- ***Notifications:*** 75 notifications in the quarter (2014, 67);

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187 notifications over the last 12 months (2014, 149), giving a rate of 4.1 cases per 100,000 population (2014, 3.4), a statistically significant increase.

- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (32 cases). 71 cases were laboratory confirmed. Overseas travel or prior travel information was recorded for 73 cases. The most commonly visited countries were Tonga (39 cases), and Indonesia (16 cases).

Hepatitis A

- ***Notifications:*** 18 notifications in the quarter (2014, 38); 54 notifications over the last 12 months (2014, 113), giving a rate of 1.2 cases per 100,000 population (2014, 2.5), a statistically significant decrease.
- ***Comments:*** there has been a statistically significant quarterly decrease from the same quarter last year (38 cases). Cases were aged between 5 and 45 years. Overseas travel information was recorded for 16 cases. Of these, 8 (50.0%) case had not travelled overseas during the incubation period of the disease.

Hepatitis (not otherwise specified)

- ***Notifications:*** 3 notifications in the quarter (2014, 1); 10 notifications over the last 12 months (2014, 1), giving a rate of 0.2 per 100,000 population, a statistically significant increase.

Shigellosis

- ***Notifications:*** 44 notifications in the quarter (2014, 39); 133 notifications over the last 12 months (2014, 129), giving a rate of 2.9 cases per 100,000 population (2014, 2.9), not a statistically significant change.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (23 cases). Overseas travel or prior travel information was recorded for all cases. Of these, 15 (34.1%) cases had not travelled overseas during the incubation period and had no prior history of travel that could account for their infection.

Zika fever

- ***Notifications:*** 1 notification in the quarter (2014, 15); 43 notifications over the last 12 months (2014, 15), giving a rate of 1.0 per 100,000 population (2014, 0.3), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the same quarter last year (15 cases). The case was overseas during the incubation period of the disease.

Blood- & tissue-borne infections

Hepatitis C

- ***Notifications:*** 20 notifications in the quarter (2014, 7); 42 notifications over the last 12 months (2014, 32), giving a rate of 0.9 cases per 100,000 population (2014, 0.7), not a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (no cases) and from the same quarter last year (7 cases). Cases were aged between 20 and 80 years.

3. OTHER SURVEILLANCE REPORTS

Lymphogranuloma venereum: an emerging sexually transmitted infection in New Zealand

Chlamydia trachomatis is the most common bacterial sexually transmitted infection (STI) in New Zealand. In 2013 it was estimated that the national incidence was 633 per 100,000 population.[1] It commonly causes urogenital infections, but less commonly can cause lymphogranuloma venereum (LGV). Urogenital infections are caused by serovars D through to K and LGV is caused by serovars L1, L2 and L3. LGV is endemic in developing countries, but was uncommon until the early 2000s in most developed countries. It is infrequently diagnosed in New Zealand, with the last cases being reported in 2008.[2] In both cases the infection was acquired overseas. However, the diagnosis of LGV in four men who have sex with men (MSM) in Auckland over a three-month period in 2013 and more recently in one MSM in Waikato in 2014 provides compelling evidence of localised transmission of LGV between MSM.[3] Four of the cases had no history of recent overseas travel and likely acquired their infection locally.

Since 2003 different outbreaks or clusters of LGV have occurred in Europe, North America and Australia among MSM.[4] Three of the cases reported were co-infected with HIV and four were co-infected with *Neisseria gonorrhoeae*, consistent with the profile of LGV among MSM reported overseas.[5]

All five cases presented with signs and symptoms consistent with rectal LGV infection, including pruritis, anal discomfort or bloody rectal discharge. LGV is caused by serovars L1–L3 of *C. trachomatis*. After an incubation period of 3–30 days, a primary lesion develops at the site of inoculation; typically the penis, urethra or rectum in MSM. The small, painless papule may ulcerate, heal spontaneously and leave no residual scar. If the primary infection involves the rectum, the mucosa becomes hyperaemic and friable. Multiple discrete superficial ulcers with irregular borders develop granulomas can replace the mucosa, with crypt abscesses forming.[6] The secondary stage of the infection is characterised by lymph nodes draining the primary lesion. This stage may be associated with systemic features such as malaise, fever and headaches.

Four men were seen at sexual health clinics, but the fifth man was seen by a surgical service at the local hospital. Routine STI testing for at-risk groups (including anorectal specimen collection in MSM) is recommended in national guidelines, but implementation is not monitored.[7] An anonymised self-completed community survey found that approximately 48% of MSM seek sexual health screening at a general practitioner. Whether this screening is consistent with the approach recommended in the national guideline is not known.[8]

The diagnosis of LGV is confirmed by the detection of serovar-specific *C. trachomatis* DNA in ulcer material from primary anogenital lesions or from rectal specimens (in suspected cases of anorectal LGV). In the first step, a commercially available nucleic acid amplification test (NAAT) platform is used to detect *C. trachomatis*. If *C. trachomatis* is detected, then LGV-specific serovar is identified by two methods. The first method is to sequence the outer membrane protein *omp1* gene (as variations in the omp1 gene have genotyped chlamydial isolates previously). The second method is to target the polymorphic membrane protein H (*pmpH*) gene containing a deletion present only in the L serovars. This means an accurate diagnosis, and awareness of the need for specific LGV testing in high-risk patients who test positive for *C. trachomatis* infection, is essential for accurate diagnosis. Additional testing for LGV serovars on rectal swabs that are positive by a molecular assay for *C. trachomatis*, is currently only done on request by the clinician and specialist advice may be required regarding local laboratory requirements. The absence of clinical symptoms should not distract from additional testing if the clinical index of suspicion is high. For example, in one series 40% of LGV cases were pauci-symptomatic or asymptomatic.[4]

LGV is curable with antibiotics, but if left untreated it can have serious and permanent adverse sequelae.[9] Enhanced surveillance of sexually transmitted infections, particularly in high-risk groups, is required in New Zealand. But surveillance alone will not result in better outcomes. National leadership, readily accessible diagnostic services and performance-based measures are required to ensure improvement in the sexual health and wellbeing of New Zealanders.

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

Reported by Indira Basu, LabPlus and Sally Roberts, Department of Microbiology, Auckland District Health Board.

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 2015). Comparisons are made to the previous quarter (October to December 2014), and to the same quarter in the previous year (January to March 2014). Data contained in this section is based on information recorded in EpiSurv by public health service staff up to 7 April 2015. As this information may be updated over time, this data should be regarded as provisional.

General

- 154 outbreaks notified in this quarter (1325 cases).
- 96 are final reports (1045 cases); 58 are interim reports (280 cases) that have yet to be finalised and closed.

All data that follow relate to final reports only.

- 10.9 cases on average per outbreak, compared with 16.0 cases per outbreak in the previous quarter (17.8 cases per outbreak in the same quarter of last year).
- 25 hospitalisations: norovirus (14 cases), 'gastroenteritis' (3 cases), *Salmonella* (3 cases), *Shigella* (2 cases), *Campylobacter* (1 case), *Escherichia coli* O157:H7 (1 case), and rotavirus/norovirus (1 case).
- No deaths.
- Three outbreaks involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to group totals.

Pathogens

- 32 norovirus outbreaks (551 cases).
- 25 'gastroenteritis' outbreaks (331 cases).
- 11 *Giardia* outbreaks (37 cases).
- 8 *Salmonella* outbreaks (41 cases).
- 7 *Campylobacter* outbreaks (36 cases).
- 4 *Shigella* outbreaks (12 cases).
- 3 *Bordetella pertussis* outbreaks (18 cases).
- 2 *Aeromonas* species outbreaks (7 cases).
- 2 *E. coli* O157:H7 infection outbreaks (5 cases).
- 2 rotavirus outbreaks (44 cases).
- 1 *Cryptosporidium* outbreak (5 cases).
- 1 sapovirus outbreak (25 cases).
- 1 *Yersinia* outbreak (2 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.

- 79 person-to-person, from (non-sexual) contact with an infected person (including droplets): 31 norovirus (549 cases), 21 'gastroenteritis' (322 cases), 10 *Giardia* (35 cases), 6 *Salmonella* (13 cases), 3 *B. pertussis* (18 cases), 2 *Campylobacter* (4 cases), 2 *E. coli* O157:H7 (5 cases), 2 rotavirus (44 cases), 1 *Aeromonas* species (5 cases), 1 *Cryptosporidium* (5 cases), 1 sapovirus (25 cases), 1 *Shigella* (2 cases), and 1 *Yersinia* (2 cases).
- 18 environmental, from contact with an environmental source (eg, swimming): 6 norovirus (105 cases), 5 'gastroenteritis' (91 cases), 3 *Giardia* (10 cases), 1 *Campylobacter* (6 cases), 1 *Cryptosporidium* (5 cases), 1 *E. coli* O157:H7 infection (3 cases), and 1 *Salmonella* (3 cases).
- 15 foodborne, from consumption of contaminated food or drink (excluding water): 3 *Campylobacter* (10 cases), 3 'gastroenteritis' (7 cases), 2 *Aeromonas* species (7 cases), 2 norovirus (4 cases), 2 *Salmonella* (28 cases), 1 *Giardia* (4 cases), 1 *Shigella* (2 cases), and 1 *Yersinia* (2 cases).
- 6 waterborne, from consumption of contaminated drinking water: 2 *Giardia* (7 cases), 1 *Campylobacter* (6 cases), 1 *Salmonella* (2 cases), 1 *Shigella* (2 cases), and 1 *Yersinia* (2 cases).
- 1 zoonotic, from contact with an infected animal: *Campylobacter* (2 cases).
- 4 'other' mode: 2 norovirus (32 cases), 1 *Aeromonas* species (5 cases), 1 'gastroenteritis' (16 cases), and 1 rotavirus (18 cases).

- 9 mode of transmission unknown: 3 *Campylobacter* (20 cases), 2 *Shigella* (8 cases), 1 'gastroenteritis' (2 cases), 1 *Giardia* (2 cases), 1 norovirus (2 cases), and 1 *Salmonella* (2 cases).

Circumstances of exposure

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

- 26 long term care facility: 14 norovirus (303 cases) and 12 'gastroenteritis' (192 cases).
- 25 home: 9 *Giardia* (33 cases), 6 *Salmonella* (13 cases), 2 *Campylobacter* (4 cases), 2 norovirus (7 cases), 2 *Shigella* (8 cases), 1 *Aeromonas* species (2 cases), 1 *B. pertussis* (5 cases), 1 *E. coli* O157:H7 infection (2 cases), and 1 *Yersinia* (2 cases).
- 11 restaurant/café/bakery: 5 'gastroenteritis' (11 cases), 4 norovirus (12 cases), 1 *Campylobacter* (6 cases), and 1 *Salmonella* (26 cases).
- 8 childcare centre: 4 norovirus (106 cases), 3 'gastroenteritis' (54 cases), 2 rotavirus (44 cases), 1 *B. pertussis* (5 cases), and 1 sapovirus (25 cases).
- 5 hospital acute care: 5 norovirus (81 cases).
- 3 other institution: 2 norovirus (28 cases) and 1'gastroenteritis' (10 cases).
- 1 camp: *Giardia* (4 cases).
- 1 community gathering: *B. pertussis* (8 cases).
- 1 farm: *Campylobacter* (6 cases).
- 1 marae: *Giardia* (4 cases).
- 1 other food outlet: norovirus (14 cases).
- 1 school: 'gastroenteritis' (50 cases).
- 1 workplace: 'gastroenteritis' (9 cases).
- 3 other setting: 1 *Aeromonas* species (5 cases), 1 *E. coli* O157:H7 (3 cases), and 1 *Shigella* (2 cases).
- 2 outbreaks had two or more exposure settings recorded.
- 10 outbreaks had no exposure settings recorded.

Common 'settings' where food was prepared in foodborne outbreaks are identified below.

- 6 restaurant/café/bakery: 3 'gastroenteritis' (7 cases), 1 *Campylobacter* (6 cases), 1 norovirus (2 cases), and 1 *Salmonella* (26 cases).
- 5 home: 1 *Aeromonas* species (2 cases), 1 *Campylobacter* (2 cases), 1 *Giardia* (4 cases), 1 *Salmonella* (2 cases), and 1 *Yersinia* (2 cases).
- 2 commercial food manufacturer: 1 *Aeromonas* species (5 cases) and 1 *Shigella* (2 cases).
- 1 marae: *Giardia* (4 cases).
- 2 outbreaks had no preparation settings recorded.

5. OUTBREAK CASE REPORTS

No reports this quarter.

6. LABORATORY SURVEILLANCE

Yersinia pseudotuberculosis 2014 outbreak – the laboratory's perspective

Yersiniosis is the third most frequently notified foodborne disease in New Zealand, with an annual incidence of 10.8 cases per 100,000 population in 2013.[1] This is high compared to some other developed countries, for example, total incidence in the European Union was 1.6 cases per 100,000 in 2011.[2]

The genus *Yersinia* includes 11 species, three of which are important human pathogens: *Yersinia pestis, Y. enterocolitica* and *Y. pseudotuberculosis*. Only *Y. enterocolitica* and *Y. pseudotuberculosis* cause food and waterborne diseases. Yersiniosis is a zoonotic infection of domestic and wild animals; humans are considered incidental hosts. Clinical symptoms of yersiniosis include diarrhoea, fever, vomiting and abdominal pain. Post-infection sequelae of reactive arthritis and erythema nodosum may also occur.[2] In older children and young adults, abdominal pain in the right lower abdomen can occur, which may be mistaken for appendicitis. In elderly people and in patients with underlying conditions, systemic forms of the disease are often observed.[2]

Yersinia pseudotuberculosis is thought to be distributed less widely in the environment than *Y. enterocolitica* but both are considered to be significant foodborne pathogens.[3] Outbreaks caused by *Y. pseudotuberculosis* are rare, but they have been recorded where grated carrots,[4] lettuces[5] and milk[6] were the vehicles. Infections from *Y. enterocolitica* are often linked to pork products[7] and pigs are considered to be a major reservoir of human pathogenic strains.[8] *Yersinia pseudotuberculosis* is also found in the gut of many wild and domestic animals and is considered one of the most serious and common infectious disease of deer in New Zealand.[9]

Little is known of the prevalence or numbers of this organism on foods in New Zealand. Methods for the isolation of *Y. enterocolitica* are regarded as extremely difficult[10] and methods applicable to the simultaneous isolation of both foodborne *Yersinia* species are rare.[11] Current methods available to detect *Yersinia* species in food are similar to those used for many other foodborne pathogens. The method consists of the enrichment of the food sample, followed by plating onto selective media, confirmation of typical colonies and testing for virulence properties of isolated strains. However, existing culture media lack selectivity and are unreliable for differentiating *Yersinia* species from non-*Yersinia* background flora. Enrichment broths developed for detection of *Y. enterocolitica* are not effective for culture of *Y. pseudotuberculosis*,[12] and CIN agar (commonly used for the isolation of *Y. enterocolitica*) has been reported to be inhibitory to *Y. pseudotuberculosis*.[13]

Cold enrichment is often used as an alternative to selective enrichment. Being psychrophilic, *Yersinia* species can grow at refrigeration temperatures allowing enrichment broths to be incubated at between 4°C and 10°C for long periods (10–21 days). The disadvantage to these methods, however, is that results are not available until 3–4 weeks

after sample submission. The media's low selectivity allows environmental (non-pathogenic) *Yersinia* species and other bacteria to multiply during enrichment. Polymerase chain reaction (PCR)-based procedures that target chromosomal virulence genes are now gaining recognition as useful adjuncts to culture based methods for food and environmental samples.[9]

The ESR Public Health Laboratory currently has an experimental method available for analysis of food and environmental samples for pathogenic *Y. enterocolitica* and *Y. pseudotuberculosis*. The method incorporates cold enrichment, selective culture and multiplex-PCR and, depending on sample type, takes 2–4 weeks to complete.

The Enteric Reference Laboratory (ERL) uses biochemical profiling to confirm presumptive *Yersinia* isolates submitted by diagnostic laboratories from around New Zealand. In addition to species identification, ERL determines the biotype for *Y. enterocolitica* using a scheme published in 1987.[14] The biochemical activity of the yersiniae is temperature dependent, with most reactions being more consistently expressed at 30°C rather than at 37°C. The *Y. enterocolitica* group shows considerable heterogeneity and *Y. enterocolitica*-like organisms are frequently being referred to ERL which do not fit the currently recognised biochemical profile.

On 22 September 2014, ERL sent an Alert regarding an increase in *Y. pseudotuberculosis* isolates submitted by laboratories in the Christchurch, Wellington and Auckland regions. By 4 November 2014, ERL had confirmed 172 isolates of *Y. pseudotuberculosis* (Table 1). This compared to one and three cases reported for the same period in 2012 and 2013, respectively. During the same timeframe, 220 cases had been notified on EpiSurv. To have a better understanding of the difference in notification rates, diagnostic laboratories submitting *Yersinia* isolates to ERL were contacted and asked about their procedures around the identification and notification of *Yersinia*. A survey that ESR did in 2007 had already revealed differences in clinical practices, in reporting and in use of reference services occurring throughout the country. These differences lead to differential notification rates;[15] confirmed again in this short survey.

To establish whether these isolates were closely related, molecular typing was required. Pulsed-field gel electrophoresis (PFGE) is one way to establish strain relatedness. There is however no standard method available for *Y. pseudotuberculosis.* In a short timeframe, ERL implemented a PFGE method based on Gilpin *et al.*[16] and Souza *et al.*[17] The PulseNet *Escherichia coli* O157 protocol[18] was used to make plugs of *Y. pseudotuberculosis* DNA, but with modifications to cell density (0.35–0.40), switch time (1.0–15.0), and enzymatic digestion of DNA with *XbaI* (for 2 h). ERL performed the typing of a representative number (66) of isolates and four PFGE profiles were identified. The majority (59) of the isolates shared a common profile, while five cases had a variant of the "outbreak profile", and two cases had completely distinct profiles to the "outbreak profile". These "2014" PFGE profiles were shown to be distinguishable to historical isolates from 2008, 2011 and 2013.

Based on differing practices by diagnostic laboratories around New Zealand, it is likely that yersiniosis is under reported. In addition, challenges in the isolation of both *Y. enterocolitica* and *Y. pseudotuberculosis*, not only from clinical but also from food samples, means that our knowledge of the sources and transmission routes of both species is limited, and this is especially true for *Y. pseudotuberculosis*.

TABLE 1. Number of *Yersinia pseudotuberculosis* isolates confirmed by ERL by district health board

District health board	Number confirmed by ERL
Canterbury	79
Combined Auckland[1]	34
Combined Wellington[2]	20
Southern	12
Bay of Plenty	11
Waikato	5
Lakes	4
Northland	2
Taranaki	2
Hawke's Bay	1
Nelson Marlborough	1
Tairawhiti	1
Total	**172**

[1] Combined Auckland includes Auckland, Counties Manukau and Waitemata DHBs.
[2] Combined Wellington includes Capital & Coast, Hutt Valley and Wairarapa DHBs.

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

Reported by Muriel Dufour, Maurice Wilson, Hugo Strydom and Khadija Suleiman, Health Group, 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

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CONTRIBUTIONS to this publication are invited in the form of concise reports on surveillance issues or outbreak investigations. Please send contributions and feedback to: Scientific Editor, New Zealand Public Health Surveillance Report, ESR, PO Box 50-348, Porirua, 5240, Wellington, New Zealand. Phone: (04) 914 0700; Fax (04) 914 0770; Email: survqueries@esr.cri.nz