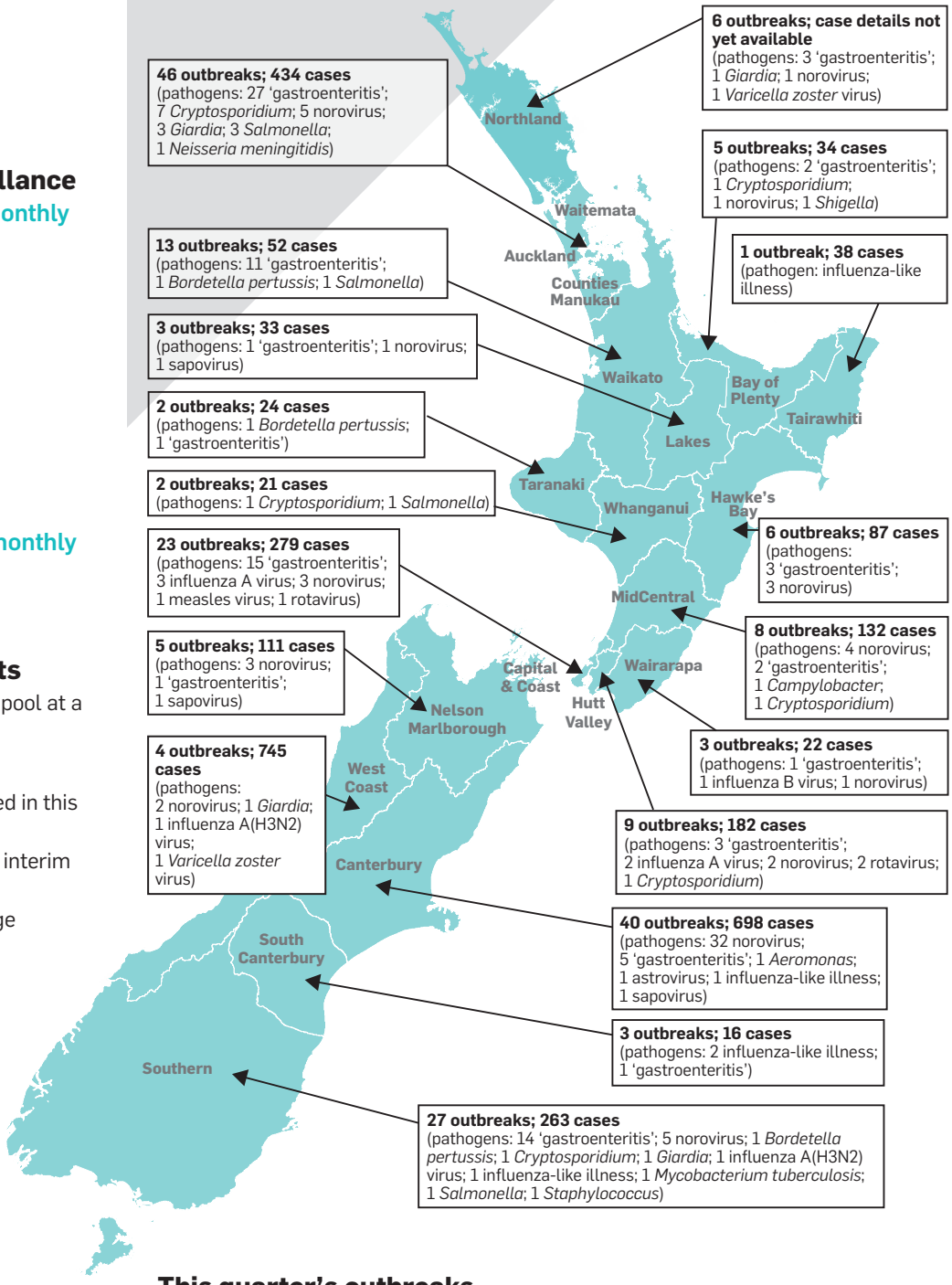
Volume 14 Issue 4

NEW ZEALAND

Public Health Surveillance Report

December 2016: Covering July to September 2016

CONTENTS AND HIGHLIGHTS



This quarter's outbreaks

Notification and outbreak data in this issue are drawn from the July to September quarter of 2016. 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 10 October 2016. 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.

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

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1. EDITORIAL

Rotavirus in New Zealand, 2015

Rotavirus infections are the most common cause of severe gastroenteritis in young children worldwide. Prior to the introduction of a rotavirus vaccine in New Zealand, an estimated 1 in 52 children were hospitalised with rotavirus gastroenteritis by 3 years of age.[1] On 1 July 2014, a three-dose schedule of the oral rotavirus vaccine RotaTeq® was added to the national childhood immunisation schedule, to be administered at 6 weeks, 3 months and 5 months of age. RotaTeq® is a pentavalent vaccine containing live reassortant rotaviruses derived from human G1, G2, G3, G4 and P1 types and bovine P7 and G6 types. One year after the vaccine's introduction, vaccine coverage was reported as 87.6% at age 8 months for the quarter April–June 2015.

We established sentinel hospital-based surveillance of rotavirus infections at Kidz First Children's Hospital (Counties Manukau District Health Board) following the introduction of rotavirus vaccine. In addition, we analysed data from national hospital discharges and community laboratory testing of gastroenteritis stool samples from before and after rotavirus vaccine introduction.

Prior to the introduction of RotaTeq®, the average annual number of rotavirus hospitalisations for children under 5 years was 670 (215 per 100,000) for 2010–2014. After vaccine introduction, the annual number of hospitalisations decreased by 85% to 99 cases (32 per 100,000) in 2015 (Figure 1).

Community laboratory data from Labtests and Southern Community Laboratories support a decrease in the number of rotavirus-positive samples following the introduction of the vaccine. The proportion of all gastroenteritis stool samples that tested positive for rotavirus decreased from 12–14% in 2010–2014 to less than 3% in 2015.

Annual rotavirus infections follow a cyclical pattern. Rotavirus vaccination was introduced in New Zealand mid-way through a high incidence year (2014), so a lower number of rotavirus infections in 2015 may have been expected regardless of the vaccine. However, the decline after the vaccine was introduced is marked. Some herd effect and high levels of immunity in non-eligible children from past infection may also have contributed to the large decline.

Surveillance of rotavirus is important to determine whether vaccine pressure results in the selection of specific rotavirus genotypes. G12P[8] is emerging as a predominant genotype circulating globally[2] and was the most prevalent (47.5%) rotavirus genotype detected in New Zealand in 2015. Three rotaviruses, G1P[not typed (nt)], G1P[8] and GntP[8], were identified as vaccine-like. Six (10.2%) of the 59 genotyped rotaviruses were from cases aged 5 years and over.

The diagnostic procedures used by New Zealand laboratories vary and, with lower numbers of positive samples, laboratories may need to review and change assays. Laboratories may need to move towards highly specific antigen-detection tests in order to ensure optimal test sensitivity and specificity.

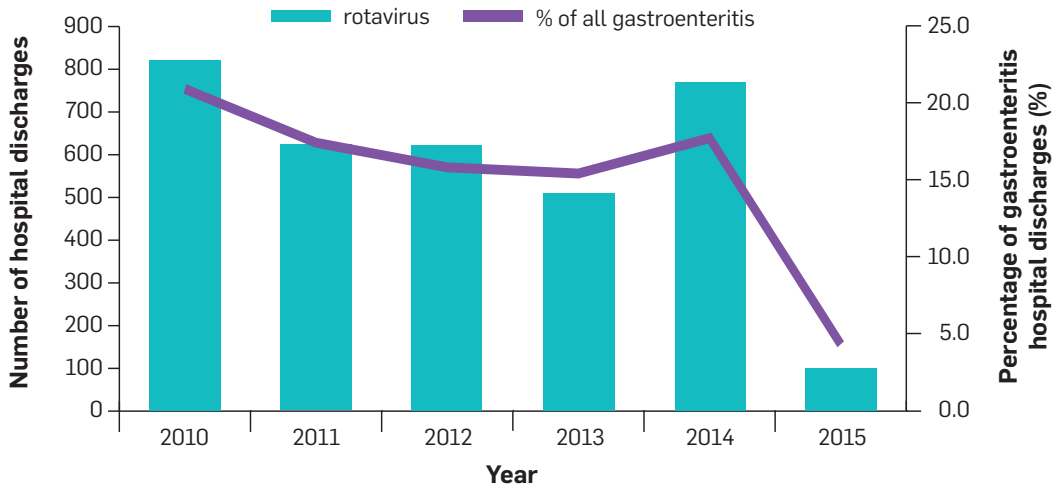
PHARMAC announced that on 1 July 2017, the funded rotavirus vaccine will be changed from RotaTeq® to the monovalent vaccine Rotarix® with a two-dose schedule. Vaccine effectiveness for both vaccines is high,[2] but ongoing surveillance will be important to ensure the demonstration of adequate protection.

References

1. Grimwood K, Huang QS, Cohet C, *et al*. 2006. Rotavirus hospitalisation in New Zealand children under 3 years of age. J. Paediatr. Child Health 42(4):196–203.
2. Payne D, Boom J, Staat M, *et al*. 2013. Effectiveness of pentavalent and monovalent rotavirus vaccines in concurrent use among US children <5 years of age, 2009–2011. Clin. Infect. Dis. 57(1):13–20.

Reported by Susan Jack, Yvonne Galloway and Joanne Hewitt, Health Group, ESR.

FIGURE 1. Rotavirus hospital discharges for under 5 year olds and as a percentage of all gastroenteritis discharges, all New Zealand, 2010–2015



2. NOTIFIABLE DISEASE SURVEILLANCE

The following is a summary of disease notifications for the July to September quarter of 2016 and cumulative notifications and rates calculated for a 12-month period (October 2015 to September 2016). 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.]. Information in this section is based on data recorded in EpiSurv by public health service staff up to 10 October 2016. As the data may be updated over time, this information should be regarded as provisional.

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

Vaccine preventable disease

Invasive pneumococcal disease

- ***Notifications:*** 179 notifications in the quarter (2015, 160); 486 notifications over the last 12 months (2015, 452), giving a rate of 10.6 cases per 100,000 population (2015, 9.8), not a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (121 cases). Cases were aged between 4 days and 98 years, with 6 cases aged <2 years.

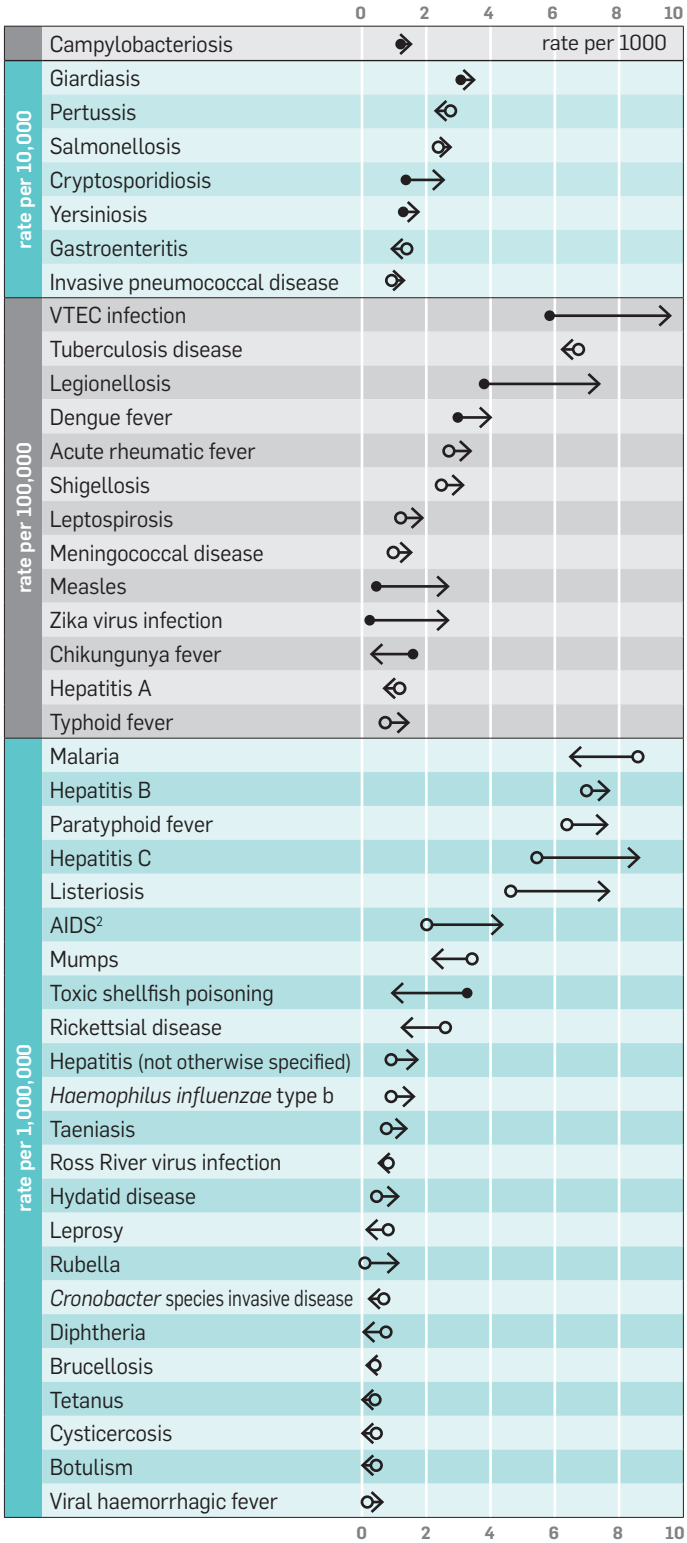
Measles

- ***Notifications:*** 11 notifications in the quarter (2015, 0); 105 notifications over the last 12 months (2015, 13), giving a rate of 2.3 cases per 100,000 population (2015, 0.3), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (87 cases) and a statistically significant increase from the same quarter last year (no cases). 2 cases were aged <15 months. 9 cases were confirmed and 2 notifications were still under investigation, some of which are expected to be classified 'not a case'.

Pertussis

- ***Notifications:*** 266 notifications in the quarter (2015, 444); 1069 notifications over the last 12 months (2015, 1138), giving a rate of 23.3 cases per 100,000 population (2015, 24.8), not a statistically significant decrease.
- ***Comments:*** there has been a statistically significant quarterly decrease from the same quarter last year (444 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 2015 to September 2016 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.

Enteric infections

Campylobacteriosis

- ***Notifications:*** 2023 notifications in the quarter (2015, 1478); 6818 notifications over the last 12 months (2015, 6455), giving a rate of 148.4 cases per 100,000 population (2015, 140.5), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (1089 cases) and from the same quarter last year (1478 cases). 659 cases were linked to a single outbreak in Havelock North.

Gastroenteritis (acute)

- ***Notifications:*** 167 notifications in the quarter (2015, 125); 555 notifications over the last 12 months (2015, 582), giving a rate of 12.1 cases per 100,000 population (2015, 12.7), not a statistically significant decrease.
- ***Comments:*** there has been a statistically significant increase from the previous quarter (120 cases) and from the same quarter last year (125 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.

VTEC infection

- ***Notifications:*** 65 notifications in the quarter (2015, 87); 440 notifications over the last 12 months (2015, 268), giving a rate of 9.6 cases per 100,000 population (2015, 5.8), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (106 cases). The annual increase may be due to a recent change in laboratory methods in the Auckland region, all faecal specimens are now screened for VTEC using PCR.

Yersiniosis

- ***Notifications:*** 226 notifications in the quarter (2015, 177); 799 notifications over the last 12 months (2015, 657), giving a rate of 17.4 cases per 100,000 population (2015, 14.3), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the same quarter last year (177 cases).

Infectious respiratory diseases

Acute rheumatic fever

- ***Notifications:*** 46 notifications in the quarter (2015, 24); 151 notifications over the last 12 months (2015, 119), giving a rate of 3.3 cases per 100,000 population (2015, 2.6), not a statistically significant increase.
- ***Comments:*** there has been a statistically significant increase from the same quarter last year (24 cases). Cases were distributed by age as follows: 5 (5–9 years), 23 (10–14 years), and 18 (≥15 years). 43 cases were an initial attack and 3 cases were a recurrent attack of acute rheumatic fever.
- ***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.

Meningococcal disease

- ***Notifications:*** 29 notifications in the quarter (2015, 31); 68 notifications over the last 12 months (2015, 57), giving a rate of 1.5 cases per 100,000 population (2015, 1.2), not a statistically significant increase.
- ***Comments:*** there has been a statistically significant increase from the previous quarter (14 cases). Cases were distributed by age as follows: 2 (<1 year), 4 (1–4 years), 4 (5– 9 years), 2 (10–14 years) and 17 (≥15 years). The highest number of cases was reported from Southern DHB (9 cases) followed by Counties Manukau DHB (5 cases). 28 cases were laboratory confirmed and the group was determined for 27 cases: group B (19 cases, including 10 NZB:P1.7-2,4 cases), group C (3 cases), group W (2 cases), and group Y (3 cases). The strain B:P1.7-2.4 was previously known as the 'NZ epidemic strain'.

Environmental exposures & infections

Cryptosporidiosis

- ***Notifications:*** 393 notifications in the quarter (2015, 277); 978 notifications over the last 12 months (2015, 673), giving a rate of 21.3 cases per 100,000 population (2015, 14.6), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (190 cases) and from the same quarter last year (277 cases). The increase in notifications may be partly due to a change in laboratory practice in the Northern region, where since late June 2015, all faecal specimens are screened for *Cryptosporidium* and *Giardia* regardless of whether parasite screening was requested.

Giardiasis

- ***Notifications:*** 352 notifications in the quarter (2015, 370); 1613 notifications over the last 12 months (2015, 1484), giving a rate of 35.1 cases per 100,000 population (2015, 32.3), a statistically significant increase.
- ***Comments:*** The increase in notifications may be partly due to a change in laboratory practice in the Northern region, where since late June 2015, all faecal specimens are screened for *Cryptosporidium* and *Giardia* regardless of whether parasite screening was requested.

Legionellosis

- ***Notifications:*** 46 notifications in the quarter (2015, 34); 311 notifications over the last 12 months (2015, 176), giving a rate of 6.8 cases per 100,000 population (2015, 3.8), a statistically significant increase.

- ***Comments:*** 13 notifications were still under investigation. The increase in notifications may be partly due to the LegiNZ study, which began in May 2015. This one year study was based in 20 hospitals, representing 17 DHBs. During the study all lower respiratory samples from hospitalised patients with suspected pneumonia were tested for *Legionella* spp. by PCR. An increase in case detection in these regions was expected.

Leptospirosis

- ***Notifications:*** 31 notifications in the quarter (2015, 10); 86 notifications over the last 12 months (2015, 66), giving a rate of 1.9 cases per 100,000 population (2015, 1.4), not a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the same quarter last year (10 cases). There were 29 male cases and 2 female cases. 18 cases were recorded as engaged in occupations identified as high risk for exposure. The most commonly recorded occupations for these cases was farmer or farm worker (13 cases) and meat process worker (5 cases). 10 notifications were still under investigation.

Toxic shellfish poisoning

- ***Notifications:*** no notifications in the quarter (2015, 0); 5 notifications over the last 12 months (2015, 15), giving a rate of 0.1 cases per 100,000 (2015, 0.3), a statistically significant decrease.

New, exotic & imported infections

Chikungunya fever

- ***Notifications:*** 8 notifications in the quarter (2015, 3); 24 notifications over the last 12 months (2015, 77), giving a rate of 0.5 cases per 100,000 population (2015, 1.7), a statistically significant decrease.
- ***Comments:*** 7 cases were laboratory confirmed and 1 notification was still under investigation. All 7 laboratory confirmed cases had travelled overseas during the incubation period of the disease. Countries visited were India (3 cases), Brazil (2 cases), Argentina, Fiji and Tonga (1 case each). Cases may have travelled to more than one country.

Dengue fever

- ***Notifications:*** 38 notifications in the quarter (2015, 19); 182 notifications over the last 12 months (2015, 137), giving a rate of 4.0 cases per 100,000 population (2015, 3.0), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the same quarter last year (19 cases). 36 cases were laboratory confirmed and 2 notifications were still under investigation. All 36 laboratory confirmed cases had travelled overseas during the incubation period of the disease. The most commonly visited countries were Indonesia (14 cases) and Thailand (5 cases each).

Shigellosis

- ***Notifications:*** 46 notifications in the quarter (2015, 22); 142 notifications over the last 12 months (2015, 112), giving a rate of 3.1 per 100,000 population (2015, 2.4), not a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the same quarter last year (22 cases). Overseas travel or prior travel information was known for 43 (93.5%) cases. Of these, 16 (37.2%) cases had not travelled overseas during the incubation period and had no travel history that could account for their infection.

Zika virus infection

- ***Notifications:*** 5 notifications in the quarter (2015, 2); 105 notifications over the last 12 months (2015, 4), giving a rate of 2.3 per 100,000 population.
- ***Comments:*** 4 cases were laboratory confirmed and 1 notification was still under investigation. All 4 laboratory confirmed cases had travelled overseas during the incubation period of the disease. Countries visited were Trinidad and Tobago and United States of America (2 cases), Mexico and Northern America (not further defined) (1 case), and Colombia (1 case).

3. OTHER SURVEILLANCE REPORTS

Legionellosis case linked to a spa pool at a public swimming pool

On 5 July 2016 Christchurch Hospital notified Community and Public Health (CPH) of a man in his 60s with legionellosis due to *Legionella pneumophila* infection. His urinary antigen test for *Legionella pneumophila* serogroup 1 was positive. Source tracing investigated the domestic hot water system and no *Legionellae* were isolated.

However, the person had used a spa pool at a public swimming pool within the incubation period. This was investigated in collaboration with an environmental health officer (EHO) from the Christchurch City Council.

The spa pool appeared to be well maintained and managed in line with the standard required under the New Zealand Water Quality Standards. Records show 2-hourly sampling for freely available chlorine (FAC) throughout the day. In the week before the man was exposed, the spa pool's average daily FAC levels ranged from 3.1 parts per million (ppm) to 4.1 ppm (ideal range 3–5 ppm). The investigators took samples of water from the pool surface and pre-filter, and swabbed the jet outlets for biofilm samples.

The samples were sent to ESR for testing. A significant growth (1,000 colony-forming units per litre or CFU/L) of *L. pneumophila* was cultured from the pre-filter sample. The spa pool was then closed and a thorough cleaning programme implemented that included decontamination and servicing. The council subsequently undertook super-chlorination and testing of all other spa pools at their other

facilities. It also issued a media statement on 12 August 2016 advising the public of the positive test result and the council's remedial actions. The council introduced extra fortnightly super-chlorination to the maintenance schedule and installed new water jets. Sampling that the council did a week after remediation showed no growth in *L. pneumophila*. The council reopened the spa pool to the public on 5 September 2016, and issued a second media release that day.

The warm water of spa pools and the large number of bathers encourage bacterial growth that can be inhaled because of the aerosols generated. The pools require comprehensive maintenance, disinfection and frequent cleaning. As a result of this incident, the council has implemented a fortnightly super-chlorination disinfection control for all spa pools in facilities they own and manage. It has also added extra *Legionella* testing to its usual procedures. These actions are above the required industry standard, and are designed to ensure water quality remains high and to protect the bathers who use the spa pools.

The current Pool Water Standard, NZS 5826, has no testing requirements for detecting *Legionella* bacteria. Such a test should be considered an essential part of a full spectrum of microbiological testing needed to ensure the health and safety of bathers. The fact that *Legionella* bacteria were isolated from a pool where it appeared that the active chlorine residual was maintained at a level considered high enough to prevent the growth of *Legionella* shows that the only way to know the water is free of *Legionella* is to actively test for its presence.

CPH has received relatively few notifications of legionellosis associated with spa pools although in 2013, it received notification of two cases of legionellosis associated with a poorly maintained spa pool in a hotel on the West Coast. New Zealand had three legionellosis outbreaks (involving 8 confirmed cases) associated with spa pools between 2000 and 2010 and internationally, outbreaks have been reported.[1,2]

The collaboration with the EHO, who was able to facilitate the council's response, was the key to this investigation—an investigation that highlighted that even a seemingly well-maintained spa pool can harbour significant levels of *Legionella* bacteria resulting in disease.

References

1. Coetzee N, Duggal H, Hawker J, *et al*. 2012. An outbreak of Legionnaires' disease associated with a display spa pool in retail premises, Stoke-on-Trent, United Kingdom, July 2012. Euro. Surveill. 17(37):pii=20271. Available at: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20271 [accessed 10 October 2016].
2. Fields B, Haupt T, Davis J, *et al*. 2001. Pontiac fever due to *Legionella micdadei* from a whirlpool spa: possible role of bacterial endotoxin. J. Infect. Dis. 184(10):1289–1292. Available at: http://jid.oxfordjournals.org/content/184/10/1289.full [accessed 10 October 2016].

Reported by Tara Rahdar, Health Protection Officer, Debbie Smith, Health Protection Officer and Dr Peter Mitchell, Medical Officer of Health, Community and Public Health (Canterbury) and David Harte, *Legionella* Reference Laboratory, ESR.

4. OUTBREAK SURVEILLANCE

The following is a summary of the outbreak trends for the July to September 2016. Comparisons are made to the previous quarter (April to June 2016), and to the same quarter in the previous year (July to September 2015). Information in this section is based on data recorded in EpiSurv by public health service staff up to 10 October 2016. As the data may be updated over time, this information should be regarded as provisional.

General

- 206 outbreaks notified in this quarter (3174 cases).
- 109 are final reports (2485 cases); 97 are interim reports (689 cases) that have yet to be finalised and closed.

All data that follow relate to final reports only.

- 22.8 cases on average per outbreak, compared with 13.4 cases per outbreak in the previous quarter (13.9 cases per outbreak in the same quarter of last year).
- 39 hospitalisations: norovirus (18), influenza A virus (13), 'gastroenteritis' (2), influenza A(H3N2) virus (2), *Salmonella* (2), *Cryptosporidium* (1) and influenza-like illness (1).
- 3 deaths: influenza-like illness (1), norovirus (1), and norovirus/influenza A(H3N2) virus (1).
- Three outbreaks involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to group totals.

Pathogens

- 39 norovirus outbreaks (1712 cases).
- 33 'gastroenteritis' outbreaks (343 cases).
- 11 *Cryptosporidium* outbreaks (41 cases).
- 5 influenza-like illness outbreaks (81 cases).
- 4 *Giardia* outbreaks (17 cases).
- 3 influenza A virus outbreaks (53 cases).
- 3 *Salmonella* outbreaks (8 cases).
- 3 sapovirus outbreaks (108 cases).
- 2 *Bordetella pertussis* outbreaks (8 cases).
- 2 influenza A(H3N2) virus outbreaks (737 cases).
- 2 rotavirus outbreaks (67 cases).
- 1 *Aeromonas* outbreak (14 cases).
- 1 astrovirus outbreak (15 cases).
- 1 measles virus outbreak (4 cases).
- 1 *Shigella* outbreak (8 cases).
- 1 *Varicella zoster* virus outbreak (16 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.

- 94 person-to-person, from (non-sexual) contact with an infected person (including droplets): 39 norovirus (1712 cases), 26 'gastroenteritis' (328 cases), 7 *Cryptosporidium* (26 cases), 5 influenza-like illness (81 cases), 3 influenza A virus (53 cases), 3 sapovirus (108 cases), 2 *B. pertussis* (8 cases), 2 *Giardia* (9 cases), 2 influenza A(H3N2) virus (737 cases), 2 rotavirus (67 cases), 2 *Salmonella* (5 cases),

1 *Aeromonas* (14 cases), astrovirus (15 cases), 1 measles virus (4 cases), and 1 *V. zoster* virus (16 cases).
- 12 foodborne, from consumption of contaminated food or drink (excluding water): 7 'gastroenteritis' (38 cases), 2 norovirus (163 cases), 1 *Cryptosporidium* (2 cases), 1 *Salmonella* (2 cases), and 1 *Shigella* (8 cases).
- 19 environmental, from contact with an environmental source (eg, swimming): 13 norovirus (1074 cases), 2 'gastroenteritis' (32 cases), 2 *Giardia* (8 cases), 2 influenza A(H3N2) virus (737 cases), and 1 *Cryptosporidium* (6 cases).
- 2 waterborne, from consumption of contaminated drinking water: 1 *Cryptosporidium* (3 cases) and 1 'gastroenteritis' (6 cases).
- 3 zoonotic: 2 *Cryptosporidium* (13 cases) and 1 *Giardia* (3 cases).
- 5 mode of transmission unknown: 3 'gastroenteritis' (5 cases), 1 *Cryptosporidium* (4 cases), and 1 *Salmonella* (3 cases).

Circumstances of Exposure

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

- 51 long term care facility: 25 norovirus (692 cases), 16 'gastroenteritis' (210 cases), 4 influenza-like illness (68 cases), 3 sapovirus (108 cases), 1 *Aeromonas* (14 cases), 1 influenza A virus (17 cases), 1 influenza A(H3N2) (21 cases), and 1 astrovirus (15 cases).
- 17 private home: 6 *Cryptosporidium* (16 cases), 5 'gastroenteritis' (29 cases), 4 *Giardia* (17 cases), 1 norovirus (10 cases), and 1 *Salmonella* (3 cases).
- 17 childcare centre: 7 'gastroenteritis' (107 cases), 6 norovirus (128 cases), 2 rotavirus (67 cases), 1 *B. pertussis* (3 cases), 1 *Cryptosporidium* (10 cases), and 1 influenza A virus (17 cases).
- 6 hospital acute care: 4 norovirus (34 cases), 1 influenza A virus (19 cases), and 1 influenza-like illness (13 cases).
- 3 school: 1 *B. pertussis* (5 cases), 1 influenza A virus (716 cases), 1 norovirus (716 cases), and 1 *V. zoster* virus (16 cases).
- 3 takeaways: 3 'gastroenteritis' (6 cases).
- 1 hotel/motel: *Shigella* (8 cases).
- 1 restaurant/café/bakery: 'gastroenteritis' (3 cases).
- 1 farm: *Cryptosporidium* (3 cases).
- 4 other setting: 3 *Cryptosporidium* (12 cases) and 1 *Salmonella* (3 cases).
- 1 outbreak had two or more exposure settings recorded.
- 6 outbreaks had no exposure settings recorded.

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

- 3 takeaways: 3 'gastroenteritis' (6 cases).
- 1 private home: 'gastroenteritis' (4 cases).
- 1 other setting: *Cryptosporidium* (2 cases).
- 7 outbreaks had no preparation settings recorded.

5. OUTBREAK CASE REPORTS

No reports this quarter.

6. LABORATORY SURVEILLANCE

Antimicrobial resistance

This report summarises the results from two antimicrobial susceptibility surveys completed by ESR within the last year.

Neisseria gonorrhoeae survey 2014–2015

A total of 425 *N. gonorrhoeae* isolates were collected from laboratories throughout New Zealand between October 2014 and May 2015 for antimicrobial susceptibility testing and epidemiological typing. Over two-thirds (69.4%) of the isolates came from laboratories serving the greater Auckland region. Dual therapy with ceftriaxone and azithromycin is the current standard therapy for gonorrhoea in New Zealand. Eleven (2.6%) isolates had decreased susceptibility to ceftriaxone (MIC ≥0.06 mg/L). Of these, eight were isolated from patients in the Auckland region. The rates of resistance to other antibiotics were azithromycin, 1.7% (with a further 9.4% intermediate resistance); ciprofloxacin, 32.2%; penicillin, 12.0%; spectinomycin, 0.0%; and tetracycline, 26.1%. One isolate with decreased ceftriaxone susceptibility was also azithromycin resistant.

A diverse range of types were identified among the 399 of the total 425 isolates that were typed by *N. gonorrhoeae* multi-antigen sequence typing (NG-MAST). The NG-MAST types identified among the isolates with decreased susceptibility to ceftriaxone were variable, and none were ST1407—a type associated with decreased susceptibility to ceftriaxone in other parts of the world. In contrast, three of the seven azithromycin-resistant isolates were the same type (ST10193).

These rates of antimicrobial resistance among gonococci in New Zealand are comparable to those in other developed countries. Reassuringly, the prevalence of decreased susceptibility to ceftriaxone was low. However, of concern was the finding that 11.1% of isolates were non-susceptible to azithromycin.

Unfortunately, due to the limited amount of culturing for *N. gonorrhoeae* now undertaken in many laboratories as a result of the trend to nucleic acid-based diagnosis of gonorrhoea, gonococci circulating in regions outside the greater Auckland region were under-represented in this 'national' survey. This finding highlights the need for laboratories to maintain a level of gonococcal culture sufficient to monitor resistance patterns.

A full report on this survey is available at 2014–5 *N. gonorrhoeae* AMR survey

Campylobacter jejuni survey 2015

A total of 297 *C. jejuni* isolates were collected between May and October 2015 from five sentinel-site laboratories, processing community specimens from Northland District Health Board (DHB), the three DHBs in the greater Auckland

region, Lakes and Bay of Plenty DHBs, the two DHBs in the greater Wellington region, Canterbury DHB, and Southern DHB.

Until as recently as 2013, rates of antimicrobial resistance, including resistance to erythromycin and fluoroquinolones, such as ciprofloxacin, were historically low (<5%) among *C. jejuni* in New Zealand. In this survey, all isolates were susceptible to erythromycin, but 15.5% were ciprofloxacin resistant. Most (87.0%) of the ciprofloxacin-resistant isolates were also tetracycline resistant. Ciprofloxacin resistance was more prevalent in the Auckland (31.1%) and Wellington (25.0%) regions than in the Northland (10.4%), Canterbury (9.4%), Southern (9.3%), and Bay of Plenty/Lakes (5.4%) DHBs.

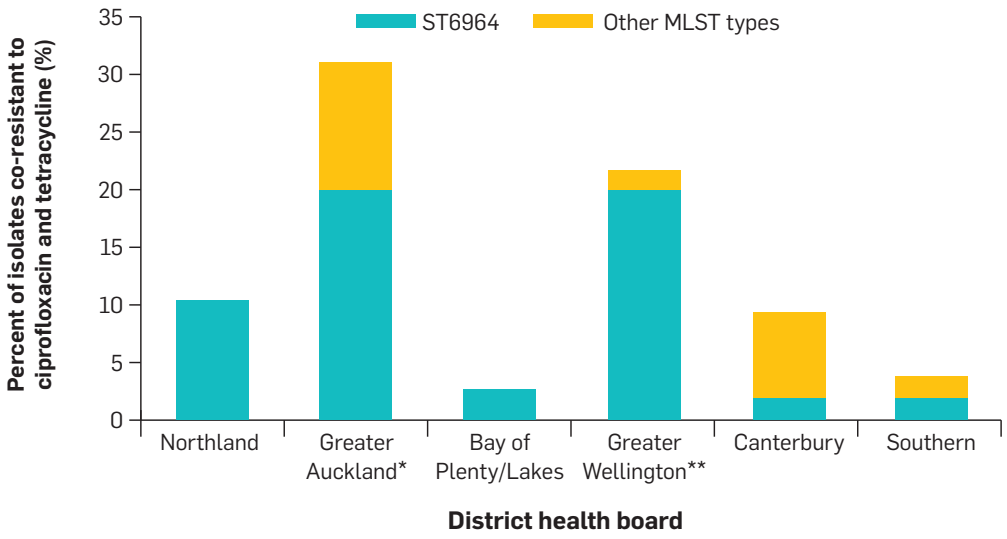
Ciprofloxacin resistance, and in particular co-resistance to ciprofloxacin and tetracycline, was strongly associated with one multilocus sequence type, ST6964. 72.5% of the isolates co-resistant to ciprofloxacin and tetracycline were ST6964. Notably, ST6964 was identified exclusively among *C. jejuni* co-resistant to ciprofloxacin and tetracycline. ST6964 accounted for all or the majority of the isolates co-resistant to ciprofloxacin and tetracycline from Northland DHB (100%), the Auckland region (64.3%) and the Wellington region (92.3%). In contrast, each of the five co-resistant isolates from Canterbury DHB was a different multilocus sequence type, only one of which was ST6964 (Figure 2).

This survey demonstrates there has been a recent and rapid increase in fluoroquinolone resistance in clinical *C. jejuni* in New Zealand, largely driven by the emergence of a single ST6964 clone. The emergence of this resistant clone in human populations has implications for the treatment and surveillance of campylobacteriosis in New Zealand. Fluoroquinolone antimicrobials can no longer be 'taken for granted' as empiric treatment for campylobacteriosis in New Zealand. Ongoing periodic surveillance of antimicrobial resistance in *Campylobacter* will be important to better track the emergence and possible further spread of resistant clones in New Zealand. Such surveillance may be a challenge in the future given the introduction of culture-independent diagnostic testing for enteric pathogens.

A full report on this survey is available at 2015 *Campylobacter* AMR survey

Reported by Helen Heffernan, Health Group, ESR.

FIGURE 2. Prevalence of, and distribution of multilocus sequence types among, *Campylobacter jejuni* co-resistant to ciprofloxacin and tetracycline, by geographical area, 2015



* Includes Auckland, Counties Manukau and Waitemata DHBs.
** Includes Hutt Valley and Capital & Coast DHBs.

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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

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