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NEW ZEALAND

Public Health Surveillance Report

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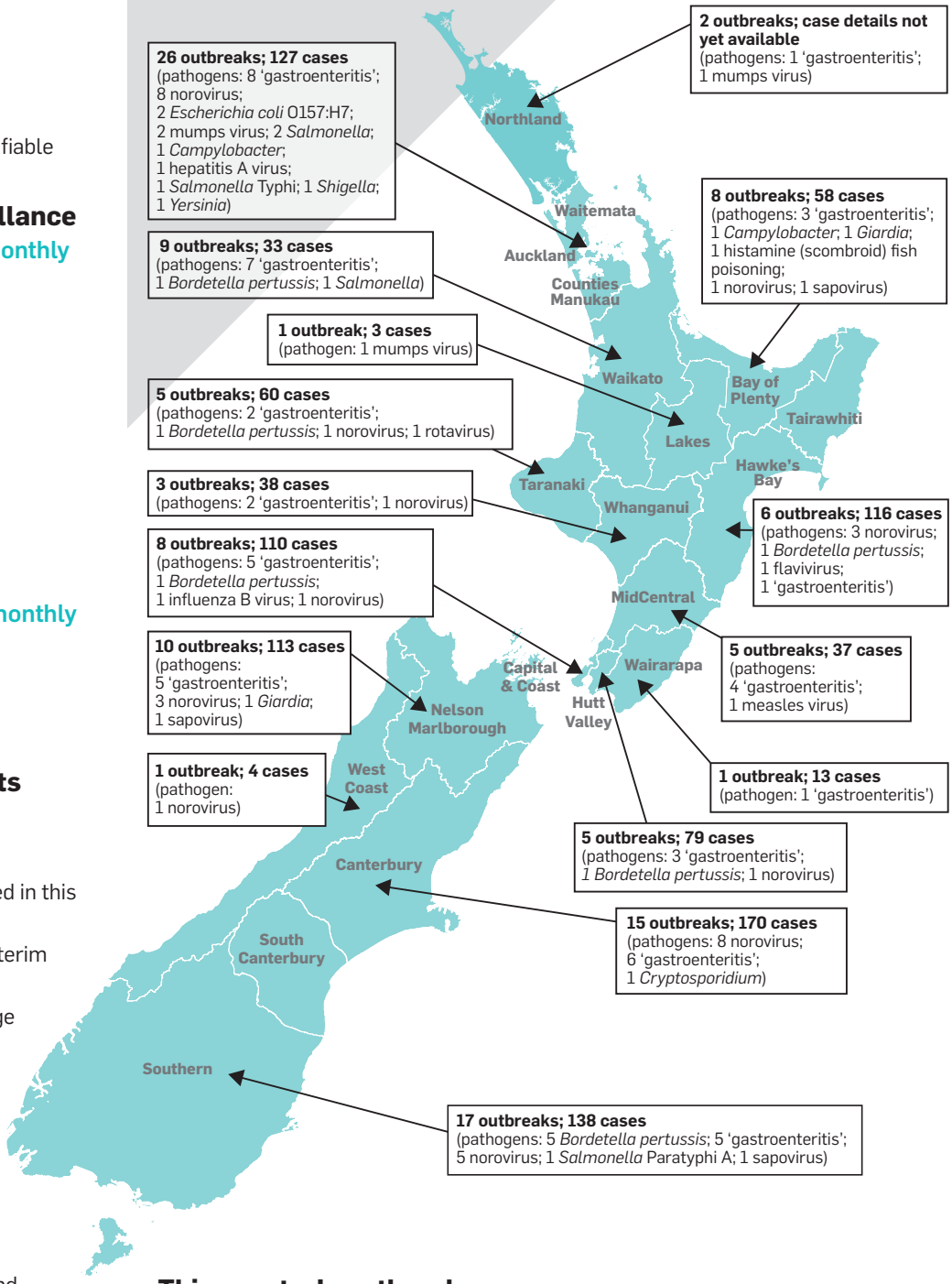

This quarter's outbreaks

Notification and outbreak data in this issue are drawn from the January to March quarter of 2017. 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 2017. 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 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

Summary of key trends in notifiable diseases for 2016

In 2016, a total of 16,305 notifications were reported through New Zealand's notifiable disease database, EpiSurv, compared with 14,306 in 2015.

From 2015 to 2016, notifications of the following diseases increased significantly: acquired immunodeficiency syndrome (AIDS), campylobacteriosis, cryptosporidiosis, dengue fever, measles, shigellosis, verotoxin-producing *Escherichia coli* (VTEC) infection, yersiniosis and Zika virus infection. Whereas, notifications of chikungunya fever, leprosy and pertussis decreased significantly.

Enteric diseases

In 2016, 7456 cases (158.9 cases per 100,000) of campylobacteriosis were notified, a significant increase compared with 6218 cases (135.3 per 100,000) in 2015. However, there had been a significant decrease in notifications in 2015 compared with 2014 (6782 cases, 150.4 per 100,000). Campylobacteriosis remains the most commonly notified disease in New Zealand (45.7% of all notifications in 2016). A campylobacteriosis outbreak (involving 964 cases) in Hawke's Bay in August 2016, associated with contaminated drinking water, largely accounts for the increase in cases in 2016, and also disrupted the usual seasonal trend of lower campylobacteriosis notifications during winter.

Cryptosporidiosis and VTEC also had significant increases in notifications from 2015 to 2016. There were 1062 cases (22.6 per 100,000) of cryptosporidiosis notified in 2016—approximately a 50% increase from 2015 (696 cases, 15.1 per 100,000). However, the 2016 total did not reach the recent peak of 1348 cases notified in 2013. In 2016, 418 cases (8.9 per 100,000) of VTEC infection were notified, compared with 330 cases (7.2 per 100,000) in 2015. Notifications of VTEC infection have increased markedly since 2014
(187 cases, 4.1 per 100,000). Recent increases in cryptosporidiosis and VTEC notifications may be attributable to changes in laboratory testing methods and referral patterns.

There were 857 cases (18.3 per 100,000) of yersiniosis in 2016, a significant increase compared with 634 cases (13.8 per 100,000) in 2015. Over the past decade, 2014 to 2016 have shown significantly higher annual yersinosis counts than other years. There were three epidemiologically-linked outbreaks involving 88 cases in 2016. The largest outbreak included 24 people linked through dining at the same restaurant chain.

In 2016, there was also a significant increase in notifications of shigellosis. There were 174 cases (3.7 per 100,000) of shigellosis notified in 2016, compared with 111 cases (2.4 per 100,000) in 2015. Most cases had a history of overseas travel during the incubation period.

Vaccine-preventable diseases

There were 103 confirmed cases (2.2 per 100,000) of measles in 2016, compared with 10 confirmed cases (0.2 per 100,000) in 2015. The majority (95.1%, 98/103) of cases were associated with three import-related outbreaks. Immunisation status was known for 93 (90.3%) cases, of which 70 (75.3%) were not immunised (including 16 cases aged <15 months who were ineligible for vaccination).

Arboviral diseases

Notifications of dengue fever and Zika virus infection significantly increased between 2015 and 2016. In 2016, 191 cases (4.1 per 100,000) of dengue fever were notified, compared with 125 cases (2.7 per 100,000) in 2015. All cases had travelled overseas during the incubation period, with Indonesia (62 cases) and Samoa (61 cases) the most commonly visited countries. There were 100 cases (2.1 per 100,000) of Zika virus infection notified in 2016, a significant increase from 2015 (9 cases, 0.2 per 100,000). Of the 100 cases of Zika virus infection, 99 cases had travelled overseas, with Tonga (58 cases) and Samoa (23 cases) the most commonly visited countries. The remaining case had not travelled overseas and was associated with sexual transmission.

In contrast, there was a significant decrease in chikungunya fever notifications in 2016 (28 cases, 0.6 per 100,000), compared with 2015 (48 cases, 1.0 per 100,000). All cases had an overseas travel history which could account for their infection.

Outbreaks

There was an increase in the number of cases associated with outbreaks in 2016 (12,246 cases, 641 outbreaks), compared with 2015 (8548 cases, 559 outbreaks). The pathogens most commonly implicated in outbreaks (with the highest numbers of associated cases) were norovirus (5548 cases, 185 outbreaks), *Campylobacter* (1008 cases, 15 outbreaks), influenza A (850 cases, 8 outbreaks) and sapovirus (668 cases, 24 outbreaks).

For a more detailed report see https://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 2017 and cumulative notifications and rates calculated for a 12-month period (April 2016 to March 2017). 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 5 April 2017. 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

Hepatitis B

- ***Notifications:*** 20 notifications in the quarter (2016, 5); 49 notifications over the last 12 months (2016, 31), giving a rate of 1.0 cases per 100,000 population (2016, 0.7), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the same quarter last year (5 cases). Cases were aged between 19 and 69 years. 12 of the notifications were still under investigation.

Invasive pneumococcal disease

- ***Notifications:*** 76 notifications in the quarter (2016, 60); 493 notifications over the last 12 months (2016, 446), giving a rate of 10.5 cases per 100,000 population (2016, 9.7), not a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (117 cases). Cases were aged between 10 days and 95 years, with 5 cases aged <2 years.

Measles

- ***Notifications:*** 12 notifications in the quarter (2016, 6); 109 notifications over the last 12 months (2016, 14), giving a rate of 2.3 cases per 100,000 population (2016, 0.3), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (1 case). 10 cases were confirmed. No cases were aged <15 months.

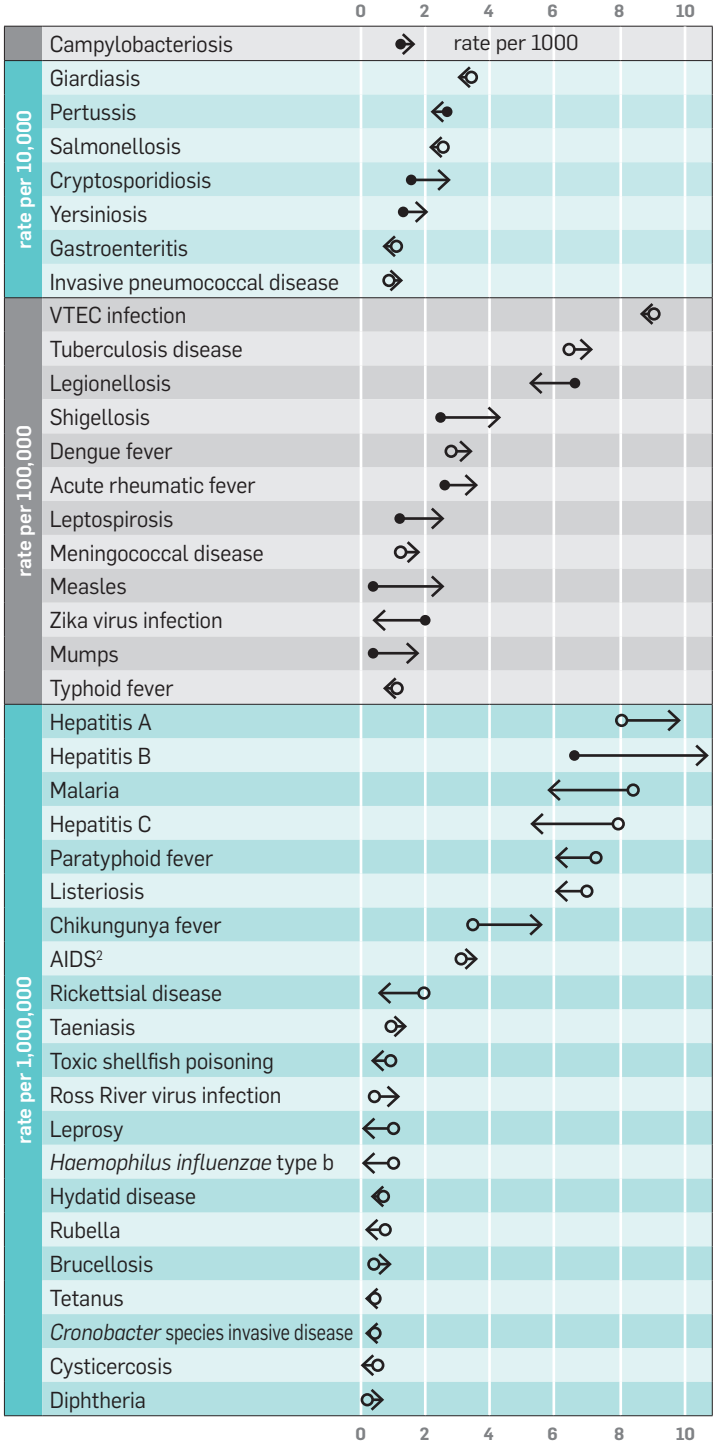
Mumps

- ***Notifications:*** 63 notification in the quarter (2016, 1); 82 notifications over the last 12 months (2016, 13), giving a rate of 1.7 cases per 100,000 population (2016, 0.3), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (14 cases) and from the same quarter last year (1 case). 49 cases were confirmed and 10 cases were still under investigation. One case was aged <15 months.

Pertussis

- ***Notifications:*** 320 notifications in the quarter (2016, 288); 1126 notifications over the last 12 months (2016, 1249), giving a rate of 24.0 cases per 100,000 population (2016, 27.2), a statistically significant decrease.

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 2016 to March 2017 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:*** 1656 notifications in the quarter (2016, 1592); 7520 notifications over the last 12 months (2016, 6262), giving a rate of 160.2 cases per 100,000 population (2016, 136.3), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (2753 cases).

Gastroenteritis (acute)

- ***Notifications:*** 88 notifications in the quarter (2016, 125); 473 notifications over the last 12 months (2016, 507), giving a rate of 10.1 cases per 100,000 population (2016, 11.3), not a statistically significant decrease.
- ***Comments:*** there has been a statistically significant quarterly decrease 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.

Listeriosis

- ***Notifications:*** 3 notifications in the quarter (2016, 11); 29 notifications over the last 12 months (2016, 32), giving a rate of 0.6 cases per 100,000 population (2016, 0.7), not a statistically significant decrease.
- ***Comments:*** no perinatal cases were reported.

Salmonellosis

- ***Notifications:*** 320 notifications in the quarter (2016, 347); 1064 notifications over the last 12 months (2016, 1047), giving a rate of 22.7 cases per 100,000 population (2016, 22.8), not a statistically significant change.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (242 cases).

VTEC infection

- ***Notifications:*** 168 notifications in the quarter (2016, 165); 421 notifications over the last 12 months (2016, 414), giving a rate of 9.0 cases per 100,000 population (2016, 9.0), not a statistically significant change.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (87 cases).

Yersiniosis

- ***Notifications:*** 218 notifications in the quarter (2016, 147); 929 notifications over the last 12 months (2016, 649), giving a rate of 19.8 cases per 100,000 population (2016, 14.1), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (292 cases) and a statistically significant increase from the same quarter last year (147 cases).

Infectious respiratory diseases

Acute rheumatic fever

- ***Notifications:*** 41 notifications in the quarter (2016, 28); 150 notifications over the last 12 months (2016, 115), giving a rate of 3.2 cases per 100,000 population (2016, 2.5), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (16 cases). Cases were distributed by age as follows: 14 (5–9 years), 9 (10–14 years), and 18 (≥15 years). 35 cases were an initial attack and 6 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.

Environmental exposures & infections

Cryptosporidiosis

- ***Notifications:*** 141 notifications in the quarter (2016, 134); 1069 notifications over the last 12 months (2016, 753), giving a rate of 22.8 cases per 100,000 population (2016, 16.4), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the previous quarter (345 cases).

Giardiasis

- ***Notifications:*** 421 notifications in the quarter (2016, 496); 1541 notifications over the last 12 months (2016, 1600), giving a rate of 32.8 cases per 100,000 population (2016, 34.8), not a statistically significant decrease.
- ***Comments:*** there has been a statistically significant quarterly decrease from the same quarter last year (496 cases).

Legionellosis

- ***Notifications:*** 87 notifications in the quarter (2016, 84); 250 notifications over the last 12 months (2016, 299), giving a rate of 5.3 cases per 100,000 population (2016, 6.5), a statistically significant decrease.
- ***Comments:*** 19 notifications were still under investigation.

Leptospirosis

- ***Notifications:*** 38 notifications in the quarter (2016, 12); 111 notifications over the last 12 months (2016, 52), giving a rate of 2.4 cases per 100,000 population (2016, 1.1), a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the same quarter last year (12 cases). There were 29 male cases and 9 female cases. 24 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 (17 cases) and meat process worker (3 cases). 9 notifications were still under investigation.

New, exotic & imported infections

Dengue fever

- ***Notifications:*** 29 notifications in the quarter (2016, 77); 143 notifications over the last 12 months (2016, 129), giving a rate of 3.0 cases per 100,000 population (2016, 2.8), not a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly decrease from the same quarter last year (77 cases). All cases were laboratory confirmed and had travelled overseas during the incubation period of the disease. The most commonly visited countries were Vanuatu (9 cases), Fiji (6 cases) and Thailand (4 cases).

Hepatitis A

- ***Notifications:*** 19 notifications in the quarter (2016, 8); 46 notifications over the last 12 months (2016, 37), giving a rate of 1.0 cases per 100,000 population (2016, 0.8), not a statistically significant increase.
- ***Comments:*** there has been a statistically significant quarterly increase from the same quarter last year (8 cases). Cases were aged between 7 and 70 years, with 5 cases aged <16 years. Overseas travel information was recorded for 18 cases. Of these, 7 (38.9%) case had not travelled overseas during the incubation period of the disease.

Malaria

- ***Notifications:*** 12 notifications in the quarter (2016, 10); 28 notifications over the last 12 months (2016, 40), giving a rate of 0.6 cases per 100,000 population (2016, 0.9), not a statistically significant decrease.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (3 cases). All cases had malaria parasites in a blood film and had travelled or resided overseas during the incubation period of the disease. The most commonly visited countries were Indonesia (5 cases) and Papua New Guinea (3 cases).

Shigellosis

- ***Notifications:*** 57 notifications in the quarter (2016, 41); 190 notifications over the last 12 months (2016, 108), giving a rate of 4.0 per 100,000 population (2016, 2.3), a statistically significant increase.
- ***Comments:*** Overseas travel or prior travel information was known for 42 (73.7%) cases. Of these, 14 (33.3%) cases had not travelled overseas during the incubation period and had no travel history that could account for their infection.

Typhoid fever

- ***Notifications:*** 24 notifications in the quarter (2016, 16); 46 notifications over the last 12 months (2016, 47), giving a rate of 1.0 per 100,000 population (2016, 1.0), not a statistically significant change.
- ***Comments:*** there has been a statistically significant quarterly increase from the previous quarter (7 cases). Overseas travel or prior travel information was known for 20 (83.3%) cases. Of these, 7 (35.0%) case had not travelled overseas during the incubation period and had no travel history that could account for their infection.

Zika virus infection

- ***Notifications:*** 2 notifications in the quarter (2016, 83); 19 notifications over the last 12 months (2016, 91), giving a rate of 0.4 per 100,000 population (2016, 2.0), a statistically significant decrease.
- ***Comments:*** there has been a statistically significant quarterly decrease from the same quarter last year (83 cases). One case was laboratory confirmed. Both cases had travelled overseas during the incubation period of the disease. Countries visited were Sri Lanka and Singapore (1 case) and Thailand (1 case).

3. OTHER SURVEILLANCE REPORTS

No reports this quarter.

4. OUTBREAK SURVEILLANCE

The following is a summary of the outbreak trends for the January to March 2017. Comparisons are made to the previous quarter (October to December 2016), and to the same quarter in the previous year (January to March 2016). Information in this section is based on data recorded in EpiSurv by public health service staff up to 5 April 2017. As the data may be updated over time, this information should be regarded as provisional.

General

- 122 outbreaks notified in this quarter (1102 cases).
- 76 are final reports (810 cases); 46 are interim reports (292 cases) that have yet to be finalised and closed.

All data that follow relate to final reports only.

- 10.7 cases on average per outbreak, compared with 14.7 cases per outbreak in the previous quarter (13.6 cases per outbreak in the same quarter of last year).
- 11 hospitalisations: *Bordetella pertussis* (3), norovirus (3), *Campylobacter* (1), flavivirus (1), hepatitis A virus (1), histamine (scombroid) fish poisoning (1), and measles virus (1).
- No deaths.
- One outbreak involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to group totals.

Pathogens

- 27 'gastroenteritis' outbreaks (279 cases).
- 24 norovirus outbreaks (420 cases).
- 7 *B. pertussis* outbreaks (32 cases).
- 2 *Escherichia coli* O157:H7 outbreaks (4 cases).
- 2 *Giardia* outbreaks (7 cases).
- 2 *Salmonella* outbreaks (4 cases).

- 2 *Campylobacter* outbreaks (8 cases).
- 1 *Cryptosporidium* outbreak (4 cases).
- 1 flavivirus outbreak (3 cases).
- 1 hepatitis A virus outbreak (6 cases).
- 1 histamine (scombroid) fish poisoning outbreak (2 cases).
- 1 influenza B virus outbreak (10 cases).
- 1 measles virus outbreak (7 cases).
- 1 mumps virus outbreak (3 cases).
- 1 rotavirus outbreak (8 cases).
- 1 *Salmonella* Paratyphi A outbreak (3 cases).
- 1 sapovirus outbreak (10 cases).
- 1 *Yersinia* outbreak (5 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.

- 61 person-to-person, from (non-sexual) contact with an infected person (including droplets): 22 'gastroenteritis' (262 cases), 19 norovirus (358 cases), 7 *B. pertussis* (32 cases), 2 *E. coli* O157:H7 (4 cases), 2 *Giardia* (7 cases), 2 *Salmonella* (4 cases), 1 *Cryptosporidium* (4 cases), 1 flavivirus (3 cases), 1 influenza B virus (10 cases), 1 measles virus (7 cases), 1 mumps virus (3 cases), 1 rotavirus (8 cases), and 1 sapovirus (10 cases).
- 7 foodborne, from consumption of contaminated food or drink (excluding water): 3 norovirus (13 cases), 1 *Campylobacter* (3 cases), 1 'gastroenteritis' (2 cases), 1 hepatitis A virus (6 cases), and 1 histamine (scombroid) fish poisoning (2 cases).
- 3 environmental, from contact with an environmental source (eg, swimming): 1 *Cryptosporidium* (4 cases), 1 hepatitis A virus (6 cases), and 1 norovirus (15 cases).
- 2 waterborne, from consumption of contaminated drinking water: 1 'gastroenteritis' (4 cases) and 1 *Salmonella* (2 cases).
- 7 mode of transmission unknown: 3 'gastroenteritis' (11 cases), 2 norovirus (49 cases), 1 *Campylobacter* (5 cases), 1 *S.* Paratyphi A (3 cases), and 1 *Yersinia* (5 cases).

Circumstances of Exposure

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

- 28 long term care facility: 14 norovirus (266 cases), 13 'gastroenteritis' (145 cases), and 1 sapovirus (10 cases).
- 16 private home: 6 *B. pertussis* (27 cases), 2 *E. coli* O157:H7 (4 cases), 2 *Giardia* (7 cases), 2 norovirus (6 cases), 2 *Salmonella* (4 cases), 1 'gastroenteritis' (4 cases), and 1 mumps virus (3 cases).
- 12 childcare centre: 9 'gastroenteritis' (118 cases), 1 *B. pertussis* (5 cases), 1 norovirus (23 cases), and 1 rotavirus (8 cases).
- 3 school: 2 *B. pertussis* (8 cases) and 1 norovirus (45 cases).
- 3 workplace: 2 *B. pertussis* (12 cases) and 1 mumps virus (3 cases).
- 3 other institution: 1 'gastroenteritis' (5 cases), 1 measles virus (7 cases), and 1 norovirus (4 cases).
- 2 restaurant/café/bakery: 1 histamine (scombroid) fish poisoning (2 cases) and 1 norovirus (9 cases).
- 2 other setting: 1 hepatitis A virus (6 cases) and 1 norovirus (42 cases).
- 1 cruise ship: influenza B virus (10 cases).
- 1 hospital acute care: norovirus (16 cases).
- 1 hostel/boarding house: flavivirus (3 cases).
- 1 other food outlet: norovirus (9 cases).
- 1 supermarket/delicatessen: hepatitis A virus (6 cases).
- 1 takeaway: 'gastroenteritis' (2 cases).
- 1 temporary or mobile service: 'gastroenteritis' (3 cases).
- 7 outbreaks had two or more exposure settings recorded.
- 7 outbreaks had no exposure settings recorded.

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

- 1 private home: norovirus (2 cases).
- 1 other food outlet: norovirus (9 cases).
- 1 restaurant/café/bakery: histamine (scombroid) fish poisoning (2 cases).
- 1 takeaway: 'gastroenteritis' (2 cases)
- 3 outbreaks had no preparation settings recorded.

5. OUTBREAK CASE REPORTS

An outbreak of Varicella (chickenpox) among orchard workers

In February 2017 a Pacific Island male was hospitalised with Varicella (chickenpox) pneumonia. The admitting physician notified the Medical Officer of Health, concerned that the case, an orchard worker living in boarding house accommodation, may have infected co-workers susceptible to Varicella.

In New Zealand Varicella infections are not notifiable. Infections are usually benign and are generally accepted as a childhood illness. The risk of severe disease, usually with Varicella pneumonia, increases with age.[1] However, in tropical countries where transmission is less efficient, Varicella is not one of the usual childhood infections. This means that relatively unaffected populations are particularly susceptible when they visit New Zealand.[2] People in this group include Pacific Islanders who come to Hawke's Bay and other locations in New Zealand to work under the Ministry of Business, Innovation and Employment (MBIE)'s Recognised Seasonal Employer scheme (RSE). These young, fit and healthy adults may be susceptible to complications if they come into contact with Varicella, which is highly contagious and endemic among New Zealand children.

The migrant orchard worker's onset of illness followed

exposure to another worker with similar symptoms while working on an orchard in Blenheim the previous month. While Varicella is essentially a clinical diagnosis,[3] serology and culture of a vesicle confirmed Varicella infection.

Contact investigation identified the likely 'index case'—a co-worker who had been in Blenheim and had recently crusted blisters. Contact tracing identified 15 close contacts who lived in the same accommodation block. They were then assessed for suitability to receive post exposure prophylactic (PEP) vaccination. All the co-workers came from one Pacific Island group, and 9 of the 15 had no prior exposure to Varicella. The nine co-workers gave consent for the public health nurses to administer the monovalent Varilrix® vaccine.[4,5] As exposure had already occurred, the vaccine was offered to reduce symptom severity and to prevent further hospitalisations, rather than to prevent infection.

A week after the first case was notified, a GP notified a second case. That person, suffering a relatively mild illness, worked on a different orchard, but had the same employer. The case had no obvious contact with workers from the first orchard. Isolated from the co-workers, the case only returned to work once the blisters had crusted.

Contact tracing at the second orchard identified 14 close contacts who shared the same accommodation block, and they were assessed to receive the PEP vaccination. Of these 14 contacts, 7 were recommended for vaccination and consented to a single dose of Varilrix® administered by public health nurses.

Varicella vaccine is funded for certain high-risk groups.[2] Yet, susceptible adults with no prior exposure to Varicella (such as these Pacific Island workers on the RSE scheme), while recommended for vaccine, are not funded to receive it. To avoid delays, the public health service funded a single vaccine dose for each of the 16 contacts. The doses were primarily given for outbreak management and to reduce illness severity. However, employers under the RSE scheme have a duty of care to provide medical care (eg, via health insurance) to their employees. A two-dose regimen of vaccine is highly recommended for all at-risk workers, to protect them from future infections. So the Medical Officer of Health sent an advice letter to all employers under the RSE scheme in the Hawke's Bay region. That letter recommended they offer their workers a two-dose prophylactic Varicella vaccination as soon as possible. It is unclear if all RSE employers in the region followed this advice.

The public health service provided an information session to more than 150 Pacific Islanders working on orchards. Translators and pastoral care workers helped with the session. A letter was sent to primary care advising of an increase in Varicella among orchard workers under the RSE scheme. Medical Officers of Health, the Ministry of Health, ESR and MBIE were also alerted.

Further discussions about promoting Varicella vaccine as a pre-requisite to working in New Zealand under the RSE scheme are expected to occur at a national MBIE and Ministry of Health level. The number of documented accounts of Varicella outbreaks among overseas workers to New Zealand is minimal, if any. Accurate data is limited due to infections not being notifiable, but, anecdotally, employers suggest such outbreaks are more common than first thought. Despite this, the cost of being vaccinated is small when compared to the cost of a person being hospitalised from Varicella complications or the costs in lost productivity during an outbreak.

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Reported by Rachel Eyre, Public Health Specialist, Hawke's Bay District Health Board.

6. LABORATORY SURVEILLANCE

Carbapenemase-producing Enterobacteriaceae in New Zealand, 2009–2016

Carbapenems (ertapenem, imipenem and meropenem) are antibiotics usually reserved for the treatment of serious infections due to multidrug-resistant Gram-negative bacteria. Over the last decade, resistance to carbapenems has been increasing globally and is often mediated by carbapenemases—β-lactamase enzymes that inactivate carbapenems as well as most other β-lactam antibiotics. Typically, bacteria that produce a carbapenemase are multiresistant to several other classes of antibiotics which leaves few treatment options for these organisms.

Among Enterobacteriaceae, which include *Escherichia coli* and *Klebsiella pneumoniae*, there are three main classes of carbapenemases:

- metallo-β-lactamases, the most common of which are the New Delhi metallo-β-lactamases (NDMs);
- OXA-48-like carbapenemases; and
- *K. pneumoniae* carbapenemases (KPCs).

Each of these classes of carbapenemases appears to have emerged and become prevalent in a distinct region of the world. New Delhi metallo-β-lactamases, as the name suggests, emerged in India, OXA-48-like carbapenemases emerged in Turkey, and KPCs emerged on the eastern seaboard of the United States of America. However, subsequently each of these carbapenemase types has spread and become endemic in many other regions of the globe.

In New Zealand, the first carbapenemase-producing Enterobacteriaceae (CPE) was identified in 2009. Up until the end of 2016, a total of 121 CPE were isolated from patients in New Zealand (Figure 1). The most common species among these CPE were *E. coli* and *K. pneumoniae* which together accounted for 90.1% of the CPE. The majority (74.4%) of the CPE were isolated from specimens taken to screen for multidrug-resistant organisms.

The carbapenemases most frequently identified in New Zealand have been NDM types (57.9%), followed by OXA-48-like carbapenemases (27.8%). The remaining carbapenemase types identified have included KPC types (7.1%), and VIM (4.8%) and IMP (2.4%) metallo-β-lactamases.

Overseas travel, and in particular hospitalisation overseas, is the predominant risk factor for patients with CPE in New Zealand, with 84.8% of CPE having been isolated from people who had recently travelled overseas. Notably the Indian subcontinent has been the region most frequently associated with CPE acquisition, accounting for 67.4% of all CPE acquired overseas. Most (73.7%) patients who acquired their CPE overseas had been hospitalised while overseas. Among travellers with CPE who were not hospitalised, 84.0% had been in India.

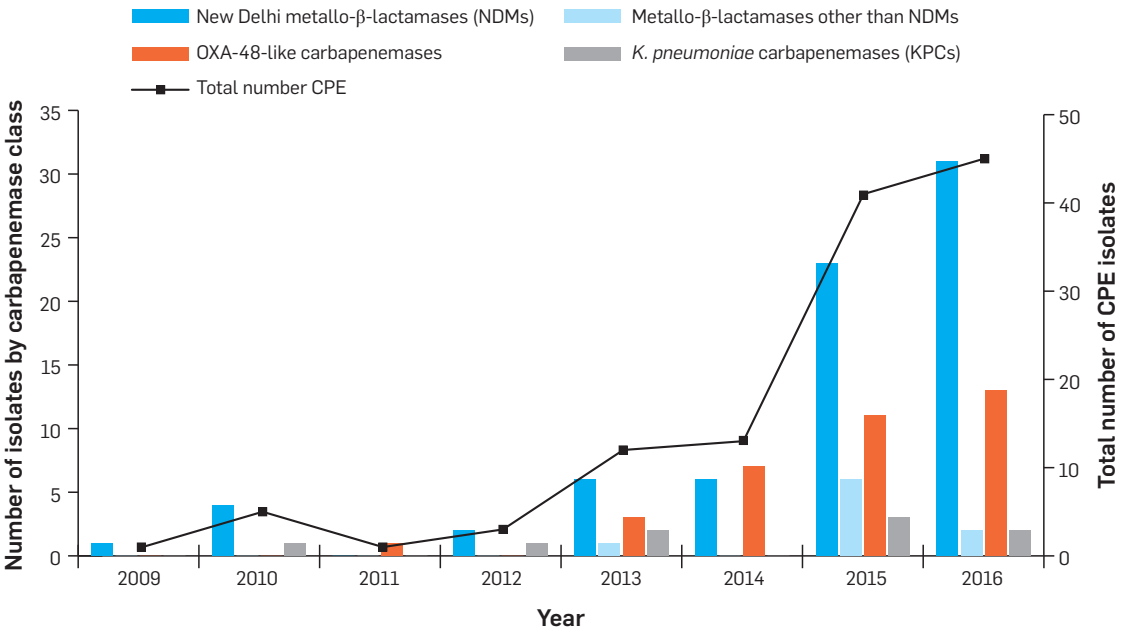
While currently most CPE identified in New Zealand are acquired overseas, there have been four episodes of transmission of these organisms in New Zealand healthcare facilities. These transmission events were of limited size and duration. The first two events occurred in 2015 in Waikato Hospital and Christchurch Hospital, and involved cross-infection of five and three patients, respectively. The other two events occurred in 2016 in Middlemore Hospital and an Auckland long-term care facility, with just one patient being cross-infected in both facilities. In all four events, the organism involved was *K. pneumoniae* but the carbapenemase types were varied (VIM, NDM and an OXA-48-like carbapenemase).

Given the epidemiology of CPE in New Zealand to date, laboratories should be particularly suspicious of any multidrug-resistant Enterobacteriaceae isolated from patients who have recently been hospitalised in, or travelled to, countries such as India where CPE are endemic.

Fuller reports are available at https://surv.esr.cri.nz/antimicrobial/AccqEnterobacteriaceae.php

Reported by Antibiotic Reference Laboratory, Health Group, ESR.

FIGURE 1. Number of carbapenemase-producing Enterobacteriaceae (CPE) isolates identified in New Zealand, by carbapenemase class, 2009–2016



Note: Multiple, distinct CPE isolates from the same patient are included, but duplicate isolates of the same species with the same type of carbapenemase from the same patient are excluded.

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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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