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New Zealand Public Health Surveillance Report

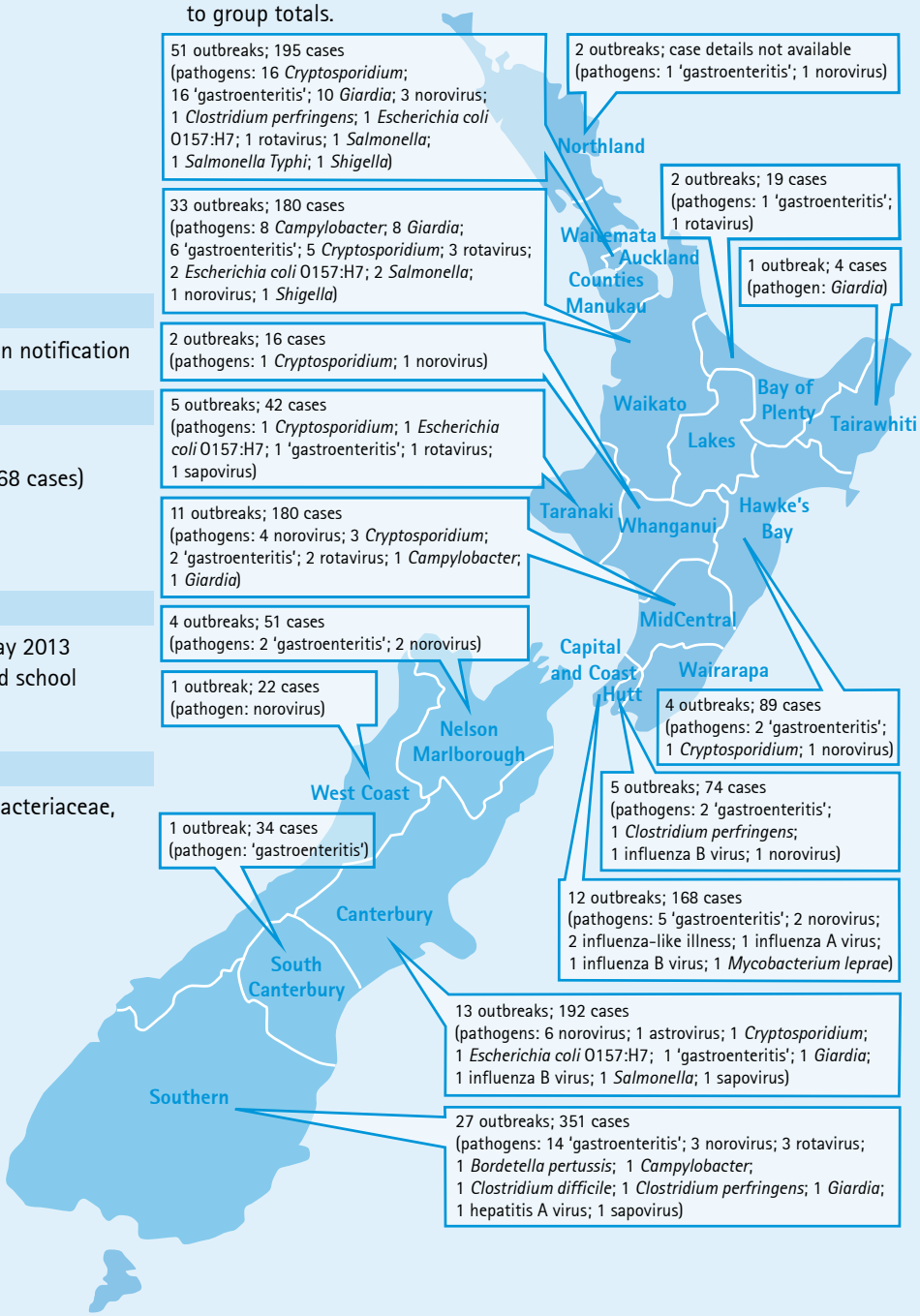
December 2013: Covering July to September 2013

Contents & Highlights

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

This Quarter's Outbreaks

Notification and outbreak data in this issue are drawn from the July to September quarter of 2013. 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 3 October 2013. Outbreaks reporting exposures in more than one geographic location are assigned to the district health board with the most cases. Four outbreaks involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to group totals.



1. Editorial

Notifiable infectious diseases

Notification is a key strategy for preventing and managing communicable and some non-communicable diseases. In New Zealand, Schedules 1 and 2 of the Health Act 1956 lists diseases that are legally required to be notified. Attending medical practitioners must notify their local medical officer of health of any notifiable disease they suspect or diagnose. Laboratories are also required to report test results that indicate that a person has, has been, or may be infected with a notifiable disease to a medical officer of health.

Notification data are recorded by each public health service via a secure web-based portal into a computerised database and are used to guide local control measures. The data are collated and analysed at the national level by the Institute of Environmental Science and Research (ESR) on behalf of the Ministry of Health.

Notifiable disease information informs the direction and scope of many local, national and international public health activities. At a local level information allows for identification and follow-up of cases and contacts, control of local outbreaks and implementation of prevention and intervention activities. At a national level notifiable disease surveillance helps public health authorities to monitor the impact of notifiable diseases, measure disease trends, assess the effectiveness of control and prevention measures, identify populations or geographic areas at high risk, formulate prevention and control strategies and develop public health policies. Monitoring surveillance data also enables public health authorities to detect sudden changes in disease occurrence and distribution.

Disease notifications are also used to meet our obligations under the International Health Regulations 2005 (IHR). The purpose and scope of the IHR are to "prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade". By providing information under the IHR, our notifiable disease data feeds into global disease surveillance and response activities.

Notification has associated costs both in terms of time and resources for those involved in the notification process and the provision of personal information collected from people with notifiable diseases. Careful consideration of the impacts and benefits must be undertaken as part of the process of making diseases notifiable, or removing diseases from the schedules. The decision to make a disease notifiable is based on the disease's public health importance, as measured by such criteria as incidence, impact and preventability. Recently the list of notifiable diseases was amended to include two emerging communicable diseases. Avian influenza A (H7N9) has been notifiable as non-seasonal influenza since 1 August 2013 and Middle East Respiratory Syndrome (MERS) has been notifiable since 6 September 2013.

With emerging diseases such as MERS and Influenza A(H7N9) notification information is valuable not only for monitoring disease incidence but also for learning more about the disease, for example the incubation period, the source of exposure and mode of transmission.

More complete notification data also allows us to make better informed decisions on disease control and prevention. Below are some recent examples of how notifiable disease surveillance information is being used by the Ministry of Health.

MERS-CoV

The World Health Organization (WHO) has requested that Member States promptly assess and notify any new case of infection with Middle East Respiratory Syndrome Coronavirus (MERS-CoV). The WHO has requested information about potential exposures that may have resulted in infection and a description of the clinical course. Investigation into the source of exposure is also recommended to identify the mode of exposure so that further transmission of the virus can be prevented.

The WHO has also requested information on surveillance activities including any suspected cases and tests performed, particularly those with a travel history to the Middle East over the period of the Hajj. While New Zealand has not had any confirmed cases of MERS as yet, the information we, and other countries, have provided has been used to inform global activities including emergency committee meetings convened under the IHR.

Measles elimination

The WHO Western Pacific Region is the second WHO region (after the Americas) where measles (and rubella) elimination is expected to be achieved. Notifiable disease surveillance plays an essential part in enabling New Zealand to verify measles elimination, and in this instance includes surveillance to ensure that measles continues to be considered and excluded.

Supporting outbreak management

Information on notified pertussis cases has been useful in understanding the current pertussis outbreak, for example, identifying which populations are at greater risk. This surveillance information has been used to support the change in vaccine eligibility allowing funded vaccination of pregnant women between 28 and 38 weeks gestation. This eligibility change was put in place by PHARMAC to protect those most at risk of severe pertussis (ie, infants), before they can be vaccinated.

As is clear from these examples, the notification data are making a valuable contribution to work to improve health at a local, national and international level. The Ministry of Health rely on those at the coal face for this valuable data, so thank you and please keep those notifications coming.

Reported by Andrea McNeill, Senior Advisor, Communicable Disease Team, Ministry of Health.

2. Notifiable Disease Surveillance

The following is a summary of disease notifications for the July to September quarter of 2013 and cumulative notifications and rates calculated for a 12-month period (October 2012 to September 2013). For comparative purposes notification numbers and rates are presented in brackets for the same periods in the previous year. A robust method of constructing 95% confidence intervals is used to determine 'statistically significant differences' throughout this report unless otherwise stated [see Newcombe RG and Altman DG 2000. Proportions and their differences. In: Statistics with Confidence. BMJ Books, Bristol.]. Data contained within this report are based on information recorded in EpiSurv by public health service staff up to 3 October 2013. As this information may be updated over time, these data should be regarded as provisional.

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

VACCINE PREVENTABLE DISEASE

Invasive Pneumococcal Disease

- *Notifications:* 182 notifications in the quarter (2012, 203); 466 notifications over the last 12 months (2012, 510), giving a rate of 10.5 cases per 100,000 population (2012, 11.5), not a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (105 cases). Cases were aged between 2 days and 92 years, with 7 cases aged less than 2 years.

Measles

- *Notifications:* 1 notification in the quarter (2012, 0); 2 notifications over the last 12 months (2012, 377), a statistically significant decrease.
- *Comments:* the case was under investigation.

Pertussis

- *Notifications:* 859 notifications in the quarter (2012, 1579); 4686 notifications over the last 12 months (2012, 5420), giving a rate of 105.7 cases per 100,000 population (2012, 122.3), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (763 cases) and a statistically significant decrease from the same quarter last year (1579 cases).

ENTERIC INFECTIONS

Campylobacteriosis

- *Notifications:* 1827 notifications in the quarter (2012, 1410); 6632 notifications over the last 12 months (2012, 7202), giving a rate of 149.6 cases per 100,000 population (2012, 162.5), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (1094 cases) and from the same quarter last year (1410 cases).

Gastroenteritis (acute)

- *Notifications:* 182 notifications in the quarter (2012, 137); 706 notifications over the last 12 months (2012, 613), giving a rate of 15.9 cases per 100,000 population (2012, 13.8), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (101 cases) and from the same quarter last year (137 cases).
- *Note*: this is not a notifiable disease *per se* except in persons with a suspected common source or with a high risk occupation. The term 'gastroenteritis' provides a catch-all category for enteric diseases that are not notifiable and for syndromic reports that come through public health units, including direct reports from the public where the causative pathogen may never be known.

Salmonellosis

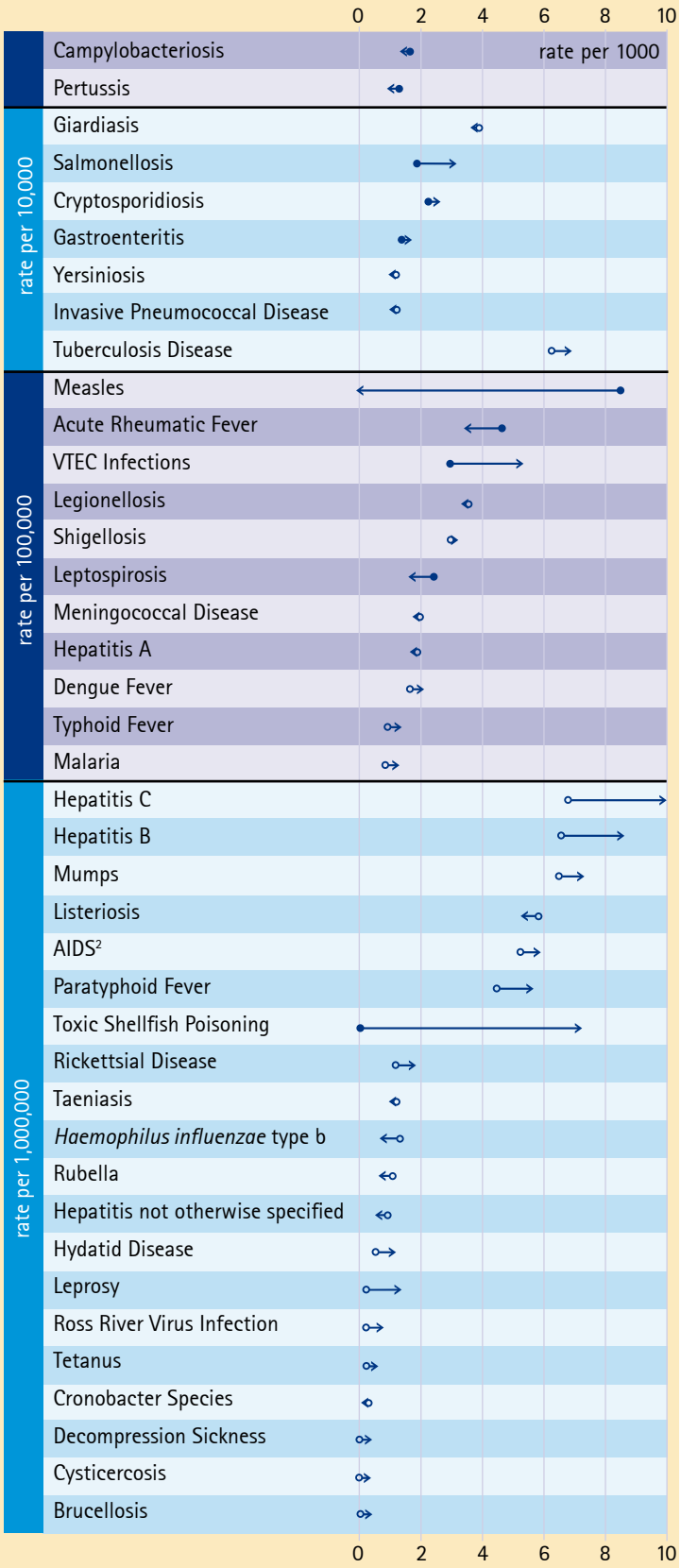
- *Notifications:* 249 notifications in the quarter (2012, 238); 1132 notifications over the last 12 months (2012, 1014), giving a rate of 25.5 cases per 100,000 population (2012, 22.9), a statistically significant increase.

VTEC Infections

- *Notifications:* 41 notifications in the quarter (2012, 31); 228 notifications over the last 12 months (2012, 129), giving a rate of 5.1 cases per 100,000 population (2012, 2.9), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (90 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 2012 to September 2013 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.

Yersiniosis

- *Notifications:* 150 notifications in the quarter (2012, 138); 478 notifications over the last 12 months (2012, 504), giving a rate of 10.8 cases per 100,000 population (2012, 11.4), not a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (86 cases).

INFECTIOUS RESPIRATORY DISEASES

Acute Rheumatic Fever

- *Notifications:* 59 notifications in the quarter (2012, 47); 160 notifications over the last 12 months (2012, 209), giving a rate of 3.6 cases per 100,000 population (2012, 4.7), a statistically significant decrease.
- *Comments:* Cases were distributed by age as follows: 37 (5–14 years) and 22 (15 years and over). 56 cases were an initial attack of acute rheumatic fever and 3 cases were recurrent attacks.

Meningococcal Disease

- *Notifications:* 33 notifications in the quarter (2012, 31); 84 notifications over the last 12 months (2012, 84), giving a rate of 1.9 cases per 100,000 population (2012, 1.9), no change.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (15 cases). Cases were distributed by age as follows: 7 (<1 year), 5 (1–4 years), 5 (5–14 years), and 16 (15 years and over). 28 cases were laboratory confirmed. Of these, the strain group was identified for 27 cases: B (17 cases, including 5 cases with group B:P1.7-2,4 strain), C (9 cases, including 8 cases with group C:P1.5-1,10-8 strain), and Y (1 case).

ENVIRONMENTAL EXPOSURES & INFECTIONS

Cryptosporidiosis

- *Notifications:* 349 notifications in the quarter (2012, 319); 1380 notifications over the last 12 months (2012, 795), giving a rate of 31.1 cases per 100,000 population (2012, 17.9), a statistically significant increase.

Legionellosis

- *Notifications:* 42 notifications in the quarter (2012, 21); 158 notifications over the last 12 months (2012, 158), giving a rate of 3.6 cases per 100,000 population (2012, 3.6), no change.
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (21 cases).

Leptospirosis

- *Notifications:* 22 notifications in the quarter (2012, 32); 78 notifications over the last 12 months (2012, 107), giving a rate of 1.8 cases per 100,000 population (2012, 2.4), a statistically significant decrease.
- *Comments:* there were 18 male and 4 female cases. 16 cases were recorded as having an occupation identified as high risk for exposure. The most commonly recorded occupations were meat process worker and farm worker (7 cases each).

Toxic Shellfish Poisoning

- *Notifications:* no notifications in the quarter (2012, 0); 32 notifications over the last 12 months (2012, 0), giving a rate of 0.7 cases per 100,000 population, a statistically significant increase.

NEW, EXOTIC & IMPORTED INFECTIONS

Hepatitis A

- *Notifications:* 28 notifications in the quarter (2012, 12); 80 notifications over the last 12 months (2012, 81), giving a rate of 1.8 cases per 100,000 population (2012, 1.8), not a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (12 cases). Cases were aged between 19 months and 67 years, with 13 cases aged less than 16 years. Overseas travel information was recorded for 27 (96.4%) cases. Of these, 23 (85.2%) cases had not travelled overseas during the incubation period of the disease.

BLOOD- AND TISSUE-BORNE INFECTIONS

Hepatitis C

- *Notifications:* 20 notifications in the quarter (2010, 6); 44 over the last 12 months (2010, 30) giving a rate of 1.0 cases per 100,000 population (2010, 0.7), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (6 cases) and from the same quarter last year (6 cases). Cases were aged between 14 months and 64 years, with one case aged less than 16 years.

3. Other Surveillance Reports

Changes to hazardous substances and lead absorption notification

Notifications for disease or injury caused by a hazardous substance are now made using an electronic system – the Hazardous Substances Disease and Injury Reporting Tool (HSDIRT). This new system aims to improve hazardous substance surveillance in New Zealand. It links primary care notification, public health unit (PHU) response and Centre for Public Health Research (CPHR) analysis.

There is a legal requirement for medical practitioners to notify hazardous substances disease and injuries to a Medical Officer of Health. Many medical practitioners are unaware of the requirement, so few cases have been reported to date.

HSDIRT has been developed to provide general practitioners (GPs) with an easy mechanism for notification – an electronic notification form linked to a Patient Management System (PMS). The reporting tool has been developed for the Ministry of Health by bestpractice Decision Support and CPHR at Massey University.

The system enables PHUs to receive notifications electronically from GPs. Notifications can be reviewed and investigated where necessary, then non-identifiable data is submitted to the national surveillance system, maintained by CPHR. Data are then used to inform policy to prevent disease and injuries from hazardous substances.

Notifications

These conditions are legally notifiable and notification can be completed through HSDIRT.

Substance group	Examples and notes
Hazardous substances injury or disease	This group of diagnoses[1] includes actions such as: swallowing a cleaning product or cosmetic, taking an intentional overdose with an agrichemical, an illness caused by exposure to solvents or chlorine, chemical contact dermatitis, a fireworks injury or the health effects of huffing butane. It *does not include* taking medicine in a finished dose form (as an over-the-counter or prescription drug overdose), alcohol (other than industrial alcohol) or radioactive materials.
Lead absorption	Cases of lead absorption ≥0.48 µmol/L must be notified.[2]
Chemical contamination of the environment	Cases of injury due to chemical contamination of the environment require notification.[2] Examples include: health effects of agrichemical spray drift, skin effects from a chemical spill and unintentional carbon monoxide poisoning.

[1] A hazardous substance is legally defined as anything that can explode, catch fire, oxidise, corrode or be toxic to humans (Hazardous Substance and New Organisms Act 1996).
[2] Health Act 1956

New notification process

A notification form is on the *bestpractice* dashboard (log in at www.bestpractice.org.nz or go directly through MedTech32) – look for 'Hazardous Substances & Lead Notifications'. There are three short sections to complete, but some data fields are prepopulated from the PMS. A short user's guide is available under the Resources tab of HSDIRT.

Primary care practices that do not use *bestpractice*, should still inform their PHU of any notifications. The PHUs will then manually enter relevant details into HSDIRT.

Access to the notification form for non-MedTech PMSs will be available later in 2013.

A notification from primary care to the PHU is required, even when there has been direct laboratory notification to the PHU. Without it, PHUs will not have all the information needed to follow up the notification.

ESR surveillance

On behalf of the Ministry of Health, ESR carries out surveillance of notifiable and other important communicable diseases in New Zealand. The notification process for these diseases to the PHU is unchanged.

HSDIRT has been developed to improve the whole pathway from notification, to surveillance, to prevention of hazardous substances diseases and injuries in New Zealand.

Reported by Maria Poynter, Public Health Medicine Registrar, Centre for Public Health Research, Massey University, Wellington Campus.

4. Outbreak Surveillance

The following information is a summary of the outbreak trends for New Zealand from data collected in the last quarter (July to September 2013). Comparisons are made to the previous quarter (April to June 2013), and to the same quarter in the previous year (July to September 2012). Note that the outbreak data in this section are notified to ESR by the Public Health Services.

General

- **174 outbreaks notified in this quarter (1594 cases).**
- **119 are 'final' reports (1326 cases); 55 are 'interim' reports (268 cases) that have yet to be finalised and closed.**

All data that follow relate to final reports only.

- **11.1 cases on average per outbreak, compared with 9.5 cases per outbreak in the previous quarter (16.9 cases per outbreak in the same quarter of last year).**
- **20 hospitalisations: norovirus (12 cases), rotavirus (4 cases), *Salmonella* Typhi (2 cases), *Campylobacter* (1 case), and *Escherichia coli* O157:H7 (1 case).**
- **No deaths.**
- **Four outbreaks involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to group totals.**

Pathogens

- 23 'gastroenteritis' outbreaks (232 cases).
- 23 norovirus outbreaks (645 cases).
- 22 *Cryptosporidium* outbreaks (122 cases).
- 18 *Giardia* outbreaks (60 cases).
- 9 rotavirus outbreaks (182 cases).
- 8 *Campylobacter* outbreaks (46 cases).
- 3 *E. coli* O157:H7 (7 cases).
- 3 influenza B virus outbreaks (28 cases).
- 3 sapovirus outbreaks (51 cases).
- 2 *Clostridium perfringens* (8 cases).
- 2 *Salmonella* outbreaks (21 cases).
- 2 *Shigella* outbreaks (4 cases).
- 1 *Bordetella pertussis* outbreak (4 cases).
- 1 *Clostridium difficile* outbreak (3 cases).
- 1 hepatitis A virus outbreak (2 cases).
- 1 influenza A virus outbreak (3 cases).
- 1 *S.* Typhi 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.

- 103 person-to-person, from (non-sexual) contact with an infected person (including droplets): 23 norovirus (645 cases), 22 *Cryptosporidium* (122 cases), 15 'gastroenteritis' (206 cases), 16 *Giardia* (53 cases), 9 rotavirus (182 cases), 5 *Campylobacter* (29 cases), 3 influenza B virus (28 cases), 3 sapovirus (51 cases), 2 *E. coli* O157:H7 (5 cases), 2 *Salmonella* (21 cases), 2 *Shigella* (4 cases), 1 *B. pertussis* (4 cases), 1 *C. difficile* (3 cases), 1 hepatitis A virus (2 cases), 1 influenza A virus (3 cases), and 1 *S.* Typhi (2 cases).
- 19 foodborne, from consumption of contaminated food or drink (excluding water): 6 'gastroenteritis' (18 cases), 4 *Giardia* (17 cases), 2 *C. perfringens* (8 cases), 2 norovirus (67 cases), 2 *Campylobacter* (4 cases), 2 *Cryptosporidium* (11 cases), 1 *E. coli* O157:H7 (2 cases), 1 *Salmonella* (2 cases), and 1 *Shigella* (2 cases).
- 28 environmental, from contact with an environmental source (eg, swimming): 7 *Cryptosporidium* (43 cases), 7 norovirus (226 cases), 6 *Giardia* (18 cases), 4 *Campylobacter* (15 cases), 3 rotavirus (95 cases), 2 'gastroenteritis' (27 cases), and 1 *E. coli* O157:H7 (2 cases).
- 18 zoonotic, from contact with an infected animal: 8 *Cryptosporidium* (55 cases), 6 *Campylobacter* (40 cases), 3 *Giardia* (10 cases), 3 *E. coli* O157:H7 (7 cases), and 1 *Salmonella* (19 cases).
- 14 waterborne, from consumption of contaminated drinking water: 7 *Cryptosporidium* (24 cases), 6 *Giardia* (21 cases), 2 *Campylobacter* (4 cases), and 1 *E. coli* O157:H7 (2 cases).
- 2 'other' modes: 1 *Giardia* (3 cases) and 1 norovirus (51 cases).
- 5 mode of transmission unknown: 4 'gastroenteritis' (14 cases) and 1 *Giardia* (4 cases).

Circumstances of Exposure

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

- 38 home: 15 *Cryptosporidium* (51 cases), 14 *Giardia* (43 cases), 4 *Campylobacter* (10 cases), 2 *E. coli* O157:H7 (5 cases), 2 *Shigella* (4 cases), 1 *B. pertussis* (4 cases), 1 norovirus (4 cases), and 1 *S.* Typhi (2 cases).
- 23 long term care facility: 11 norovirus (327 cases), 9 'gastroenteritis' (143 cases), 2 sapovirus (42 cases), and 1 rotavirus (17 cases).
- 18 childcare centre: 6 rotavirus (139 cases), 4 'gastroenteritis' (50 cases), 4 norovirus (128 cases), 2 *Cryptosporidium* (30 cases), 1 *Campylobacter* (19 cases), 1 influenza A virus (3 cases), 1 sapovirus (9 cases), and 1 *Salmonella* (19 cases).

- 8 farm: 3 *Giardia* (7 cases), 2 *Cryptosporidium* (12 cases), 2 *Campylobacter* (24 cases), 1 *E. coli* O157:H7 (2 cases), 1 *Salmonella* (19 cases).
- 5 restaurant/café/bakery: 3 'gastroenteritis' (9 cases), 1 *C. perfringens* (6 cases), and 1 norovirus (45 cases).
- 5 takeaways: 3 'gastroenteritis' (9 cases), 1 *C. perfringens* (2 cases), and 1 *Salmonella* (2 cases).
- 4 hospital (acute care): 2 norovirus (18 cases), 1 *C. difficile* (3 cases), and 1 influenza B virus (17 cases).
- 4 schools: 2 influenza B virus (11 cases) and 2 norovirus (108 cases).
- 3 other institution: 1 *Cryptosporidium* (2 cases), 1 'gastroenteritis' (9 cases), and 1 rotavirus (9 cases).
- 2 hostel/boarding school: 2 norovirus (98 cases).
- 1 other food outlet: *Salmonella* (2 cases).
- 1 prison: *Campylobacter* (7 cases).
- 1 supermarket/delicatessen: 'gastroenteritis' (2 cases).
- 1 workplace: *Campylobacter* (5 cases).
- 5 'other setting': 2 *Cryptosporidium* (28 cases), 2 'gastroenteritis' (10 cases), and 1 hepatitis A virus (2 cases).
- 7 outbreaks had two exposure settings recorded.
- 7 outbreaks had no exposure settings recorded.

Common 'settings' where the preparations occurred in foodborne outbreaks are identified below.

- 5 home: 2 *Campylobacter* (4 cases), 1 *E. coli* O157:H7 (2 cases), 1 'gastroenteritis' (2 cases), 1 *Giardia* (2 cases), and 1 *Shigella* (2 cases).
- 5 restaurant/café/bakery: 3 'gastroenteritis' (9 cases), 1 *C. perfringens* (6 cases), and 1 norovirus (45 cases).
- 5 takeaways: 3 'gastroenteritis' (9 cases), 1 *C. perfringens* (2 cases), and 1 *Salmonella* (2 cases).
- 3 farm: 2 *Cryptosporidium* (11 cases) and 2 *Giardia* (7 cases).
- 1 long term care facility: norovirus (22 cases).
- 1 other food outlet: *Salmonella* (2 cases).
- 1 other institution: *Salmonella* (2 cases).
- 1 supermarket/delicatessen: 'gastroenteritis' (2 cases).
- 4 outbreaks had two or more preparation settings.
- 2 outbreaks had no preparation settings recorded.

5. Outbreak Case Reports

An outbreak of *Salmonella* Infantis in Northland, May 2013

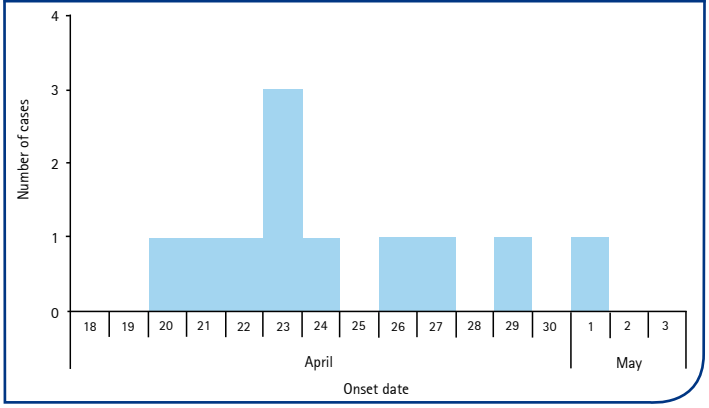
An outbreak of salmonellosis occurred in Northland during April and May 2013. Northland DHB's Public and Population Health Unit was alerted when three cases of *Salmonella* Infantis were reported by ESR on 8 May 2013. On average 3–4 cases of salmonellosis are reported in Northland per month, and *S.* Infantis is relatively uncommon. The total number of salmonellosis cases notified in Northland in 2011 and 2012 were 36 and 29, respectively. An investigation was initiated to determine the source of the illness and prevent further transmission.

A case was defined as any person with diarrhoea with or without vomiting, fever or abdominal pain, with a laboratory (presumptive or confirmed) diagnosis for *S.* Infantis, who was living in Northland for some or all of the incubation period.

A food premises in Whangarei emerged as a potential source of contaminated food during case interviews. The EpiSurv enteric disease case report form was used for case interviews, along with supplementary questions relating to specific food products and any food purchased from food premises. Health protection officers worked closely with Whangarei District Council.

In total, 12 cases of *S.* Infantis with an indistinguishable pulsed field gel electrophoresis (PFGE) profile were confirmed by ESR. The onset date of the first case was 20 April with the last case on 1 May 2013 (Figure 1). The age of cases ranged from 14 months to 76 years, and 50% were male. The incubation period was 16–72 hours (median 48 hours) and the illness length ranged from 2–12 days (median 7 days).

Figure 1. Epidemic curve of outbreak-associated cases of *Salmonella* Infantis notified to Northland DHB by onset date, April–May 2013



Note: One further case (not graphed) had an indeterminate onset date, which was likely to have been in April.

Ten of the twelve cases reported consuming food from the premises under investigation; nine of these cases experienced diarrhoea and one experienced abdominal pain only. Three of the ten cases experienced vomiting, seven had abdominal cramping and/or pain and six were febrile. Two cases were hospitalised.

The remaining two cases with no discernable link to the premises presented (on 23 and 24 April) with symptoms consistent with the case definition (and an indistinguishable *S.* Infantis PFGE profile). These cases were presumed to be secondary cases, but no clear infection source was identified from the interviews.

Food and environmental swab samples from the premises were analysed. These included samples of raw and cooked chicken products, egg and egg-based products, spices and sauces, as well as environmental swab samples.

Because of the range of foods implicated by case interviews, the involvement of a food handler was suspected, and stool samples were taken from all staff. None were positive for *S.* Infantis, but one was positive for *Shigella*. The asymptomatic staff member was stood down from work until two consecutive stool samples, taken 48 hours apart, were clear of the pathogen.

Laboratory testing of food samples from the premises confirmed the presence of *S.* Infantis with an identical genetic subtype to the notified cases in one food sample. This strongly supported the hypothesis of a link to the premises, although the positive food sample was taken 12 days after the onset date of the last case (13 May and 1 May, respectively). No further cases were notified and repeated food and food-handler specimens were negative for *S.* Infantis. All other environmental samples tested were negative.

Food suppliers, food preparation, processing and storage, and staff hygiene practices at the premises were all examined. The use of gloves appeared to be sporadic and the staff sickness log had record keeping deficits. The premises was changing ownership during April 2013, so an additional two people (the new owners), who were not normally present, were in the kitchen observing and helping with kitchen duties. This may have led to altered practices, and possibly contributed to the outbreak.

Increased vigilance around hand-washing and other hygiene practices, such as additional cleansing and disinfection, was advised. It was recommended that gloves be used at all times, to reduce the possibility of any pathogen transmission.

In late May, some calls to identify the food premises were received from the media. Because no further new cases had been reported and the food-handler test results were negative for *S.* Infantis, it was decided not to do so, given the diminished public health risk. Instead, the focus has been on increased vigilance and adherence to hygiene requirements and staff training, as well as preparing a revised food safety plan with the new owner.

This outbreak provided a useful learning opportunity for the Northland public health team. It highlighted some weaknesses in the timeliness and completeness of case reporting and the identification of outbreak thresholds, and a lack of recent planning and training for managing outbreaks. These issues are now being addressed.

Reported by Clair Mills, Medical Officer of Health and Trevor Azor, Health Protection Officer, Northland District Health Board.

A multiple enteric pathogen outbreak in an Auckland school associated with international travel

An outbreak of paratyphoid fever caused by *Salmonella* Paratyphi A occurred in an Auckland secondary school in April and May 2013 after a group of 27 students and staff returned from a 17-day trip to Vietnam and Cambodia.

Between 27 and 29 May, three cases of *S.* Paratyphi A were notified by direct laboratory notification on the basis of blood culture. All three cases were hospitalised. An investigation by the Auckland Regional Public Health Service (ARPHS) later identified a further two cases of salmonellosis and one case of shigellosis in this group.

The group consisted of 27 individuals (24 students and 3 teaching staff), who stayed in Vietnam from 18 to 28 April and Cambodia from 29 April to 3 May, returning to Auckland on 3 May. Paratyphoid cases 1 and 2 presented with diarrhoea, fever and stomach cramps from 4 May and were notified on 28 May. Paratyphoid case 3 became unwell on 24 April (while in Vietnam) and was notified on 29 May.

A full contact tracing investigation of the entire travel group was conducted, with all members deemed close contacts of the confirmed *S.* Paratyphi A cases. The contact tracing involved telephone interviews to find out if any gastroenteritis symptoms had been experienced after the trip. In addition, one faecal specimen was requested from each traveller for enteric pathogen screening, regardless of any gastroenteritis. Two further *Salmonella* cases with different serotypes (*S.* Derby and *S.* Saintpaul) and one *Shigella* case (*S. sonnei* biotype g) were identified, giving a total of nine: seven confirmed enteric cases and two unspecified gastroenteritis cases in the group.

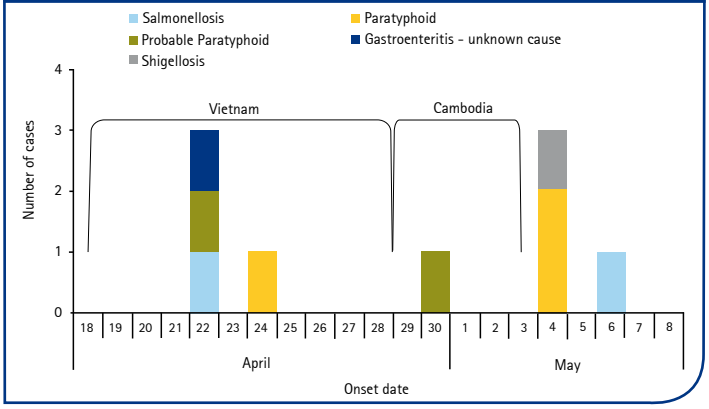
Contact tracing extended to 23 household contacts of 17 (63%) of the travellers who had confirmed enteric infections, and travellers who had symptoms of gastroenteritis. Low-risk and high-risk contacts were asked to provide one and two faecal specimens respectively. Test results for all household contacts of the travellers were negative for enteric pathogens. High risk contacts were strongly advised not to return to high risk settings until their specimens were negative, as per usual enteric disease protocols.

The outbreak investigation prioritised communication with the school in order to prevent further disease transmission within households, as well as the school, by reiterating the need for good hygiene at all times.

It is conceivable that all the infections were acquired overseas, but the infection vehicle was not identified in the investigation. A point source exposure for the confirmed three paratyphoid cases and two salmonellosis cases was unlikely, considering their onset dates (Figure 2). The exposure period for each case and the travel itinerary suggest the infections were most likely acquired in Vietnam.

High-risk activities undertaken by the group in Vietnam included swimming in surface waters, using public toilets in an overnight train, eating at food stalls in rural and urban settings and visiting rural tourist attractions with marginal standards of sanitation. Person-to-person transmission is another plausible transmission route for the paratyphoid cases, since cases 1 and 2 became ill 10 days after case 3. Sharing accommodation and food throughout the trip would have provided ample opportunity for exposure to the index paratyphoid case. The onset dates for cases in the travel group are shown in Figure 2.

Figure 2. Epidemic curve of outbreak-associated cases in the travel group by onset date and disease, April–May 2013



Note: Excludes one case of salmonellosis where the symptom onset date was unknown.

Challenges encountered during the outbreak investigation included:

- managing the high-risk household contacts of confirmed and probable paratyphoid cases (one attended childcare and two were food handlers)
- communicating risk around the outbreak
- contact compliance
- coping with multiple pathogens in a single outbreak (laboratory confirmation was particularly important to distinguish the pathogens and ensure symptomatic individuals were cared for appropriately).

Paratyphoid fever is a systemic infection caused by *Salmonella enterica*, serotype Paratyphi (*S.* Paratyphi). In developed counties with modern sanitation, paratyphoid fever is recognised as a disease associated with travel, generally to less developed countries, as was the case in this outbreak. In 2012, 11 paratyphoid fever cases were reported in the Auckland region, with nine acquired overseas.

It should be noted that this school group understood the importance of personal hygiene, stayed in accredited accommodation and attempted to avoided foods prepared in conditions with poor sanitation and activities which are considered to carry a high risk of infection.

Prepared by Jenny Wong, Health Protection Officer and Michael Hale, Medical Officer of Health, Auckland Regional Public Health Service.

6. Laboratory Surveillance

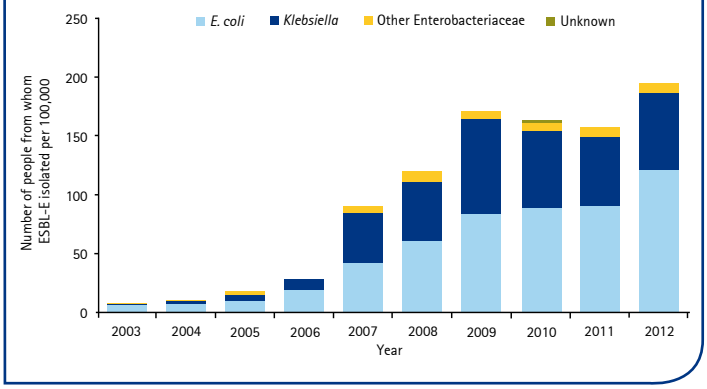
Extended-spectrum β-lactamase-producing Enterobacteriaceae, 2012

Extended-spectrum β-lactamases (ESBLs) are enzymes that confer resistance to third and fourth generation cephalosporins and monobactams, as well as earlier generation cephalosporins. They are most common in *Klebsiella pneumoniae* and *Escherichia coli*, but do occur in other Enterobacteriaceae.

ESR conducts annual month-long surveys of ESBL-producing Enterobacteriaceae (ESBL-E) to provide information on the incidence and epidemiology of ESBL-E in New Zealand. For the 2012 survey, hospital and community microbiology laboratories were asked to refer all ESBL-E isolated during the month of August to ESR. Due to the large number of ESBL-E isolated by the Microbiology Department at Middlemore Hospital and by Labtests, these two laboratories were requested to send ESBL-E for a 14-day period only, but the data analysis was adjusted to represent a one-month period.

During the 2012 survey period, ESBL-E were isolated from an estimated 723 people, which equates to an annualised incidence of 195.7 people with ESBL-E per 100,000 population – a 24.3% increase from 157.5 in 2011 (Figure 3). Information on whether the ESBL-E was causing infection or colonising was reported for 91.0% of the patients, of whom 57.0% were categorised as having an ESBL-E infection.

Figure 3. ESBL-producing Enterobacteriaceae incidence rates, 2003–2012



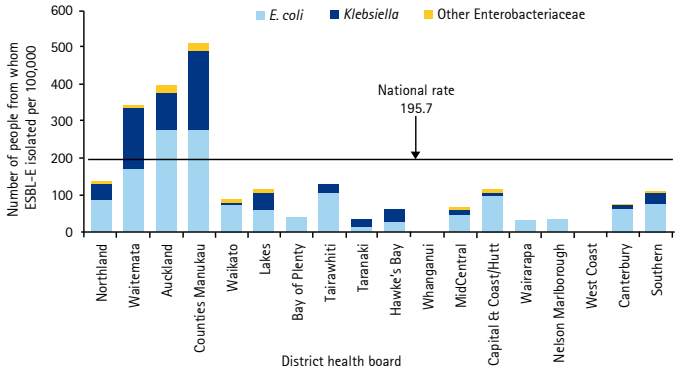
Data for 2003–2005 is based on continuous surveillance of all ESBL-E isolations. Data for 2006–2012 is annualised and based on four-week or one-month surveys conducted in these years. The 2006 survey data only included urinary *E. coli* and *Klebsiella* and is therefore not directly comparable with data from other years. The category 'Unknown' in 2010 represents people who were identified with ESBL-E during the survey period but from whom no isolate was referred to ESR, and the species was not reported.

The estimated species distribution among the ESBL-E in the 2012 survey was: *E. coli* 446 (61.7%), *Klebsiella* species 242 (33.5%), *Enterobacter* species 20 (2.8%), *Citrobacter* species 7 (1.0%), *Proteus* species 3 (0.4%), *Morganella morganii* 2 (0.3%), and *Cronobacter sakazakii, Pantoea* species and *Shigella* species 1 (0.1%) each.

Patients were categorised as hospital patients if they were either in a healthcare facility (including emergency department, outpatient clinic or residential-care facility) when ESBL-E was isolated, or had been in a healthcare facility in the previous three months. All other patients were categorised as community patients. The majority (62.7%) of the ESBL-E were isolated from hospital patients. A larger proportion of the ESBL-producing *Klebsiella* than *E. coli* were isolated from hospital patients (84.0% vs. 50.1%). These proportions of hospital patients are similar to those recorded in 2011, but lower than those recorded in earlier years: in the 2010 survey for example, 83.1% of all ESBL-E and 95.4% of ESBL-producing *Klebsiella* were isolated from hospital patients.

Figure 4 shows the incidence of ESBL-E in each district health board (DHB). The highest annualised incidence rates, as well as the rates above the national rate (195.7 per 100,000 population), occurred in the DHBs in the greater Auckland area: Counties Manukau (510.1 per 100,000), Auckland (397.2 per 100,000) and Waitemata (342.5 per 100,000) DHBs.

Figure 4. Annualised incidence of ESBL-producing Enterobacteriaceae by district health board, 2012



Data for the Capital & Coast and Hutt District Health Boards (DHBs) is combined as 'Capital & Coast/Hutt', and data for the Canterbury and South Canterbury DHBs is combined as 'Canterbury'.

A more detailed report is available at www.surv.esr.cri.nz/PDF_surveillance/Antimicrobial/ESBL/ESBL_2012.pdf

Reported by Helen Heffernan and Kristin Dyet, Health Programme, ESR.

Mycology

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

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Contributions to this publication are invited in the form of concise reports on surveillance issues or outbreak investigations.

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