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New Zealand Public Health Surveillance Report

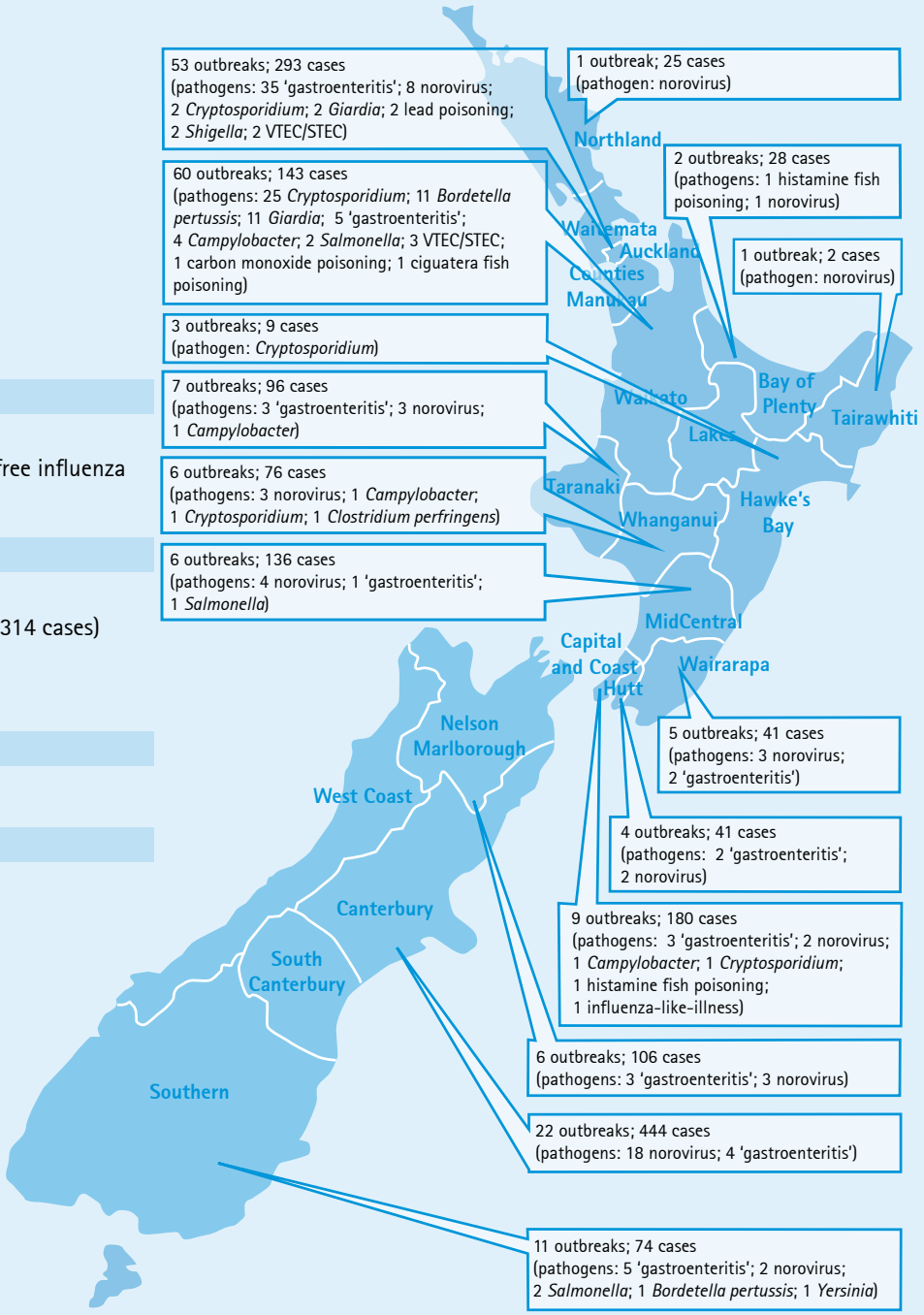
June 2013: Covering January to March 2013

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 January to March 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 April 2013. Outbreaks reporting exposures in more than one geographic location are assigned to the district health board with the most cases. Two outbreaks involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to group totals.



1. Editorials

Summary of notifiable disease surveillance trends for 2012

In 2012, 20,253 cases of notifiable disease were notified through EpiSurv, the national notifiable disease database. This was an increase from the 16,280 cases notified in 2011 and was the highest annual number of notifications since the peak in 2006 (23,179 cases).

Between 2011 and 2012, there was a statistically significant increase in the notification rate of hepatitis A (0.6 to 1.8 per 100,000 population, 213.4%), pertussis (45.3 to 133.1 per 100,000, 193.8%), dengue fever (1.0 to 1.7 per 100,000, 82.2%), leptospirosis (1.5 to 2.5 per 100,000, 65.1%), cryptosporidiosis (13.8 to 19.8 per 100,000, 42.9%), shigellosis (2.3 to 3.0 per 100,000, 29.9%), acute gastroenteritis (14.3 to 16.6 per 100,000, 15.9%) and campylobacteriosis (151.8 to 158.6 per 100,000, 4.4%).

A significant decrease in notification rates between 2011 and 2012 was noted for measles (13.5 to 1.5 per 100,000, –88.7%), mumps (1.2 to 0.6 per 100,000, –49.3%), meningococcal disease (2.7 to 1.9 per 100,000, –29.0%), invasive pneumococcal disease (IPD) (12.5 to 11.0 per 100,000, –12.2%) and giardiasis (43.9 to 38.8 per 100,000, –11.7%).

Enteric diseases

Enteric diseases continued to comprise the majority (more than 60%) of notifications in 2012. Campylobacteriosis accounted for 35% of all notifications in 2012 (7301 cases). There was a significant increase in the rate of campylobacteriosis in 2012 (158.6 per 100,000 population) compared to 2011 (151.8 per 100,000). Despite this increase, the 2012 campylobacteriosis notifications comprised less than half the number of campylobacteriosis notifications during the peak in 2006 (15,873 cases).

Other enteric diseases that showed a significant increase in the notification rate between 2011 and 2012 were acute gastroenteritis, cryptosporidiosis, hepatitis A and shigellosis. Only giardiasis presented a significant decrease in notification rate between 2011 and 2012.

Enteric diseases continued to show seasonal variations in notifications, particularly for campylobacteriosis (summer peak), cryptosporidiosis (spring peak), salmonellosis (peak varies with serotype), and VTEC/STEC infection (autumn and spring peaks).

Vaccine-preventable diseases

With 5902 cases, pertussis was the second most commonly reported notifiable disease in 2012 after campylobacteriosis. The 2012 pertussis rate (133.1 per 100,000 population) was well above that recorded in previous pertussis epidemics (107.6, 85.3 and 65.8 per 100,000, for the 2000, 2004 and 2005 epidemic years, respectively).

There was a significant decrease in the notification rate for other vaccine-preventable diseases: IPD, measles, meningococcal disease and mumps. The rate of IPD continued to decrease following the introduction of the 7-valent pneumococcal conjugate vaccine in 2008 and the 10-valent pneumococcal conjugate vaccine in 2011. There were 68 cases of measles notified in 2012 giving a rate of 1.5 per 100,000 population, a significant decrease from the previous year (13.5 per 100,000, 596 cases).

Exotic diseases

All cases of arboviral disease, leprosy, and taeniasis notified in 2012 had overseas exposures that accounted for their infection. All three cases of murine typhus notified in 2012 acquired their infection locally. There was no evidence of any recent locally acquired hydatid disease.

There was a significant increase in the dengue fever notification rate in 2012 (1.7 per 100,000, 77 cases) compared to 2011 (1.0 per 100,000, 42 cases). However, the 2012 rate was well below the 2008 rate (3.2 per 100,000, 139 cases), the highest notification rate for dengue fever since 1997.

Outbreaks

In 2012, there was an increase in the number of outbreaks and in the number of associated cases (716 outbreaks, 10,491 cases) compared with 2010 (607 outbreaks, 6354 cases) and 2011 (581 outbreaks, 7796 cases). The most common pathogen implicated in outbreaks in 2012 was norovirus (249 outbreaks, 6097 cases), followed by *Giardia* spp. (69 outbreaks, 284 cases). More than 80% of outbreaks reported in 2012 had person-to-person recorded as a mode of transmission. The most common exposure settings recorded were long-term care facilities (187 outbreaks, 4623 cases) and private homes (184 outbreaks, 709 cases).

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

Reported by Health Intelligence Team, Health Programme, ESR.

2. Notifiable Disease Surveillance

The following is a summary of disease notifications for the January to March quarter of 2013 and cumulative notifications and rates calculated for a 12-month period (April 2012 to March 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 April 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

Measles

- *Notifications:* 1 notification in the quarter (2012, 56); 13 notifications over the last 12 months (2012, 617), giving a rate of 0.3 cases per 100,000 population (2012, 14.0), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (56 cases). The case was laboratory-confirmed and was overseas during the incubation period of the disease.

Pertussis

- *Notifications:* 1384 notifications in the quarter (2012, 1240); 6045 notifications over the last 12 months (2012, 3052), giving a rate of 136.4 cases per 100,000 population (2012, 69.3), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (1708 cases) and a statistically significant increase from the same quarter last year (1240 cases).

Rubella

- *Notifications:* no notifications in the quarter (2012, 2); 2 notifications over the last 12 months (2012, 21), a statistically significant decrease.

ENTERIC INFECTIONS

Campylobacteriosis

- *Notifications:* 1634 notifications in the quarter (2012, 2216); 6439 notifications over the last 12 months (2012, 7424), giving a rate of 145.2 cases per 100,000 population (2012, 168.5), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (2077 cases) and from the same quarter last year (2216 cases).

Gastroenteritis (acute)

- *Notifications:* 139 notifications in the quarter (2012, 157); 717 notifications over the last 12 months (2012, 604), giving a rate of 16.2 cases per 100,000 population (2012, 13.7), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (286 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:* 349 notifications in the quarter (2012, 342); 1088 notifications over the last 12 months (2012, 1028), giving a rate of 24.5 cases per 100,000 population (2012, 23.3), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (281 cases).

Toxic Shellfish Poisoning

- *Notifications:* 1 notification in the quarter (2012, 0); 35 notifications over the last 12 months (2012, 2), giving a rate of 0.8 cases per 100,000 population, a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (34 cases).

VTEC Infections

- *Notifications:* 64 notifications in the quarter (2012, 42); 169 notifications over the last 12 months (2012, 128), giving a rate of 3.8 cases per 100,000 population (2012, 2.9), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (37 cases) and from the same quarter last year (42 cases).

INFECTIOUS RESPIRATORY DISEASES

Acute Rheumatic Fever

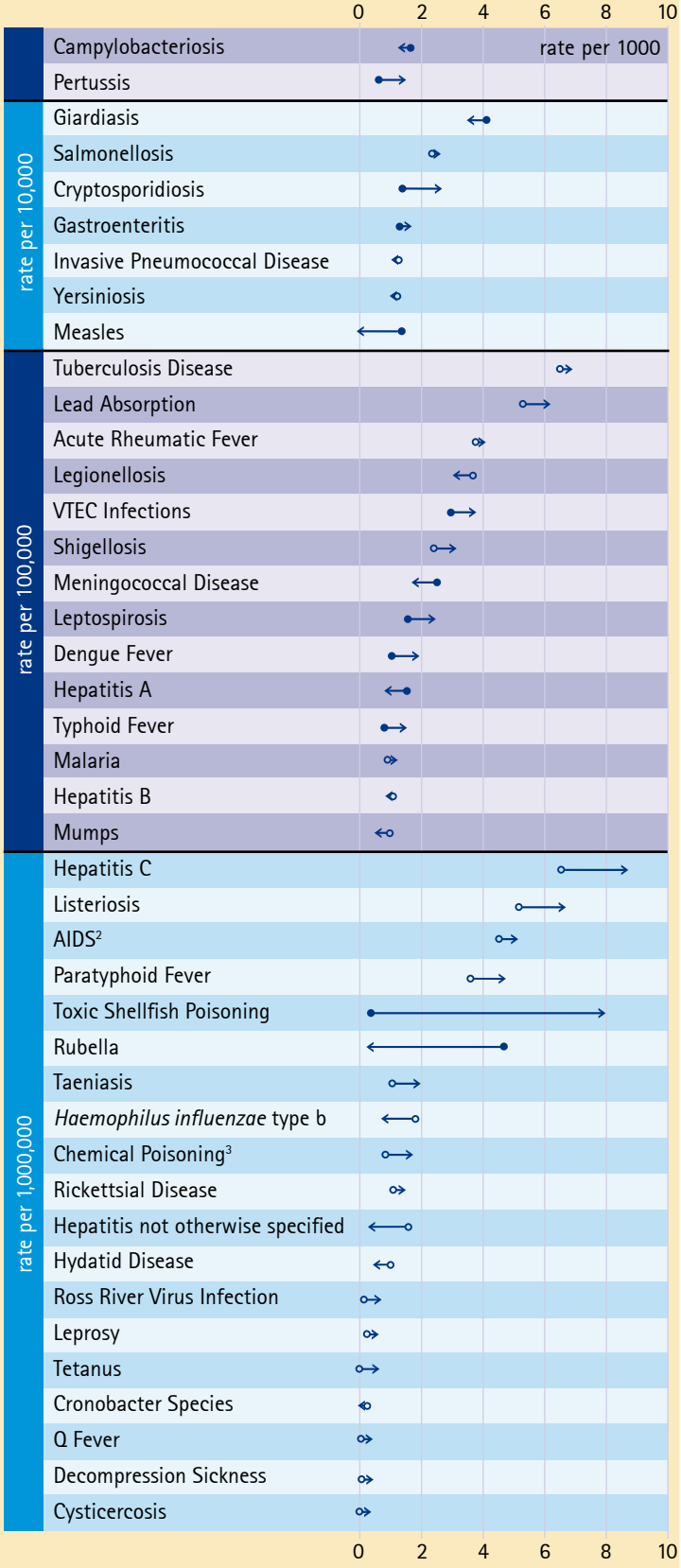
- *Notifications:* 39 notifications in the quarter (2012, 42); 177 notifications over the last 12 months (2012, 170), giving a rate of 4.0 cases per 100,000 population (2012, 3.9), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (18 cases). Cases were distributed by age as follows: 29 (5–14 years), 9 (15–24 years), and 1 (25–44 years). 37 cases were an initial attack of acute rheumatic fever and 2 cases were recurrent attacks.

Meningococcal Disease

- *Notifications:* 14 notifications in the quarter (2012, 14); 85 notifications over the last 12 months (2012, 117), giving a rate of 1.9 cases per 100,000 population (2012, 2.7), 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 2012 to March 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.

[3] From the environment.

- *Comments:* cases were distributed by age as follows: 1 (<1 year), 4 (1–4 years), 3 (5–14 years), and 6 (15 years and over). 11 cases were laboratory confirmed. Of these, the strain group was identified for 10 cases: B (6 cases, including 5 cases with group B:P1.7-2,4 strain), C (2 cases, including 1 case with group C: P1.5-1,10-8 strain), W135 and Y (1 case each).

ENVIRONMENTAL EXPOSURES & INFECTIONS

Cryptosporidiosis

- *Notifications:* 386 notifications in the quarter (2012, 110); 1153 notifications over the last 12 months (2012, 635), giving a rate of 26.0 cases per 100,000 population (2012, 14.4), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (317 cases) and from the same quarter last year (110 cases).

Giardiasis

- *Notifications:* 431 notifications in the quarter (2012, 510); 1635 notifications over the last 12 months (2012, 1828), giving a rate of 36.9 cases per 100,000 population (2012, 41.5), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (510 cases).

Lead Absorption

- *Notifications:* 71 notifications in the quarter (2012, 78); 265 notifications over the last 12 months (2012, 231), giving a rate of 6.0 cases per 100,000 population (2012, 5.2), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (37 cases). Cases were distributed by age as follows: 1 (<1 year), 3 (1–4 years), 1 (5–14 years), 5 (15–24 years), 24 (25–44 years), 31 (45–64 years), and 6 (65 years and over). There were 61 male and 10 female cases. 30 cases were recorded as having an occupation that involved exposure to lead. Occupations recorded were boat builder, foundry worker (3 cases each), painter, radiator repairer (2 cases each), joiner, manager, and tiler (1 case each). The remaining 17 cases did not have an occupation specified.

Leptospirosis

- *Notifications:* 18 notifications in the quarter (2012, 18); 108 notifications over the last 12 months (2012, 73), giving a rate of 2.4 cases per 100,000 population (2012, 1.7), a statistically significant increase.
- *Comments:* there were 17 male cases and 1 female case. 8 cases were recorded as having an occupation identified as high risk for exposure. The most commonly recorded occupation was meat process worker (7 cases).

NEW, EXOTIC & IMPORTED INFECTIONS

Dengue Fever

- *Notifications:* 28 notifications in the quarter (2012, 16); 88 notifications over the last 12 months (2012, 46), giving a rate of 2.0 cases per 100,000 population (2012, 1.0), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (11 cases). 25 cases were laboratory confirmed. 26 cases had travelled or resided overseas during the incubation period of the disease. The countries commonly visited or resided in were Thailand (6 cases), India and New Caledonia (3 cases each). 2 cases were under investigation.

Hepatitis A

- *Notifications:* 17 notifications in the quarter (2012, 53); 46 notifications over the last 12 months (2012, 71), giving a rate of 1.0 cases per 100,000 population (2012, 1.6), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (7 cases) and a statistically significant quarterly decrease from the same quarter last year (53 cases). Cases were aged between 3 and 58 years, with 8 cases aged less than 16 years. Overseas travel information was recorded for 14 (82.4%) cases. Of these, 5 (35.7%) cases had not travelled overseas during the incubation period of the disease.

Malaria

- *Notifications:* 15 notifications in the quarter (2012, 5); 48 notifications over the last 12 months (2012, 45), giving a rate of 1.1 cases per 100,000 population (2012, 1.0), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (5 cases). All cases had malaria parasites in a blood film and had travelled or resided overseas during the incubation period of the disease. The countries commonly visited or resided in were India (4 cases), Papua New Guinea and Zimbabwe (2 cases each).

Shigellosis

- *Notifications:* 47 notifications in the quarter (2012, 43); 136 notifications over the last 12 months (2012, 111), giving a rate of 3.1 cases per 100,000 population (2012, 2.5), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (24 cases). Overseas travel or prior travel information was recorded for 24 (51.1%) cases. Of these, 6 (25.0%) cases had not travelled overseas during the incubation period and had no prior history of travel that could account for their infection.

Typhoid fever

- *Notifications:* 29 notifications in the quarter (2012, 10); 63 notifications over the last 12 months (2012, 38), giving a rate of 1.4 cases per 100,000 population (2012, 0.9), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (15 cases) and from the same quarter last year (10 cases). Overseas travel or prior travel information was recorded for 19 (65.5%) cases. Of these, 5 (26.3%) cases had not travelled overseas during the incubation period.

3. Other Surveillance Reports

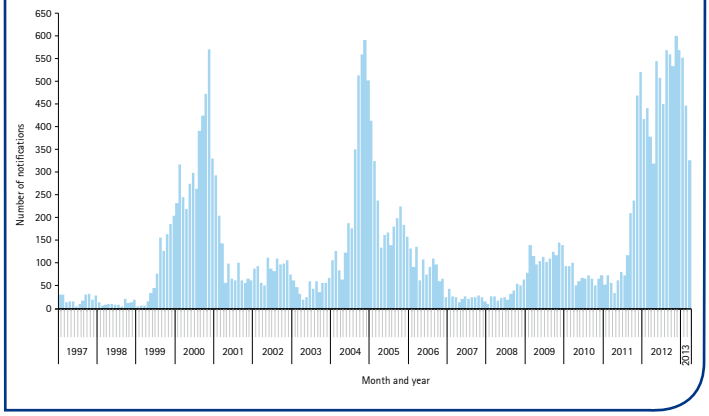
A review of recent pertussis epidemics

In a 2007 review of hospitalisations due to pertussis from 1873 to 2004, the authors estimated the mean period between epidemics to be 3.71 ± 0.93 years. They note, "After an initial decline following mass immunisation, pertussis hospitalisation rates in New Zealand have subsequently increased steadily."[1]

A review of EpiSurv data covering 27,585 notifications of confirmed, probable or suspect cases of pertussis infection from 1997 to 2013 shows three obvious outbreaks: June 1999 to February 2003, June 2003 to November 2006 and May 2011 to present (Figure 1). An increase in case numbers between February 2008 and April 2011 was initially thought to be the start of a predicted major outbreak.

The current outbreak has lasted 23 months (8995 notifications to 31 March 2013) with a monthly average of 391 cases and the highest monthly total (601 cases) in November 2012.

Figure 1. Pertussis notifications by month and year, January 1997 to March 2013



The greatest burden of disease continues to fall on infants, across all ethnic groups. Since 1997, over 6300 notifications have been for children aged less than 5 years, with approximately one third aged less than 1 year. Of the nine deaths since 1997, eight were aged less than 1 year. More than 5700 notifications were for adults aged 30 to 49 years.

Effective public health responses to pertussis depend on timely notification of suspected and confirmed cases. Medical practitioners are now reporting more cases on suspicion and making notifications sooner. The median interval between onset of symptoms and notification to the Medical Officer of Health was 19 days in 1999 and 15 days in 2011. Hospitalisation rates have decreased over the past decade.[2] In those aged less than 1 year 65% of cases notified were hospitalised in 2000 compared with 53% in 2012. Prompt notification has enabled prophylactic antibiotics to be started earlier for children aged less than 1 year, who are most at risk from infection.

Changes in the overall risk of infection in all groups are shown in Table 1. Adults have shown increasing rates of infection over the three outbreaks, which is of concern. Changes in diagnostic techniques and the introduction of direct laboratory notification may have resulted in more notifications in older people.

Table 1. Annualised notification rates for pertussis for each outbreak by age group

Age group (years)	Notification rate per 100,000 population		
	Outbreak 1	Outbreak 2	Outbreak 3
<1	392.7	188.9	542.5
1–4	189.4	84.4	283.7
5–9	188.1	107.7	210.8
10–14	88.7	96.6	148.6
15–19	29.3	53.7	68.9
20–29	17.4	26.6	63.5
30–39	23.1	40.1	95.3
40–49	17.7	39.9	97.5
50–59	12.5	37.8	72.3
60–69	9.9	38.9	60.4
70+	5.5	23.5	42.4
Overall	51.6	51.3	105.8

High infection rates have been attributed to low immunisation rates.[3] The National Immunisation Register (introduced in 2005) provides a dynamic picture of timeliness and coverage of immunisation in New Zealand. Although three primary doses of pertussis vaccine should be given by 6 months of age, only 64% of the eligible population had achieved this coverage in 2009[4] and by 12 months, 83% had been age appropriately immunised. By the end of 2012, the coverage was 80% at 6 months and 91% at12 months, but about 6000 children were still not appropriately immunised.[4]

Conclusions

- Outbreaks of pertussis have continued despite timely and higher levels of immunisation.
- Parents and caregivers should be encouraged to get their children immunised on time.
- Early notification of any suspected case is essential if public health action is to be effective in reducing the risk to young infants.
- Appropriate laboratory testing is essential for confirming pertussis infections, but notification should be made on suspicion rather than waiting for laboratory results.

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

Reported by John Holmes, Health Intelligence Team, ESR.

High influenza hospitalisations lead to extension of free influenza vaccination to young children

Free influenza vaccines have been available to at-risk groups since 1999. High influenza hospitalisations in children aged less than 5 years and low vaccine uptake have led to a request by the Ministry of Health for PHARMAC to extend the eligibility of free influenza vaccines to this age group.[1] From 1 April 2013, children aged 6 months to 5 years with significant respiratory illness are eligible for a free influenza vaccine.[2]

Recent global experience with pandemic influenza A(H1N1)pdm09 highlights the importance of monitoring severe respiratory disease to support pandemic preparedness and seasonal influenza prevention and control. A key component of Southern Hemisphere Influenza and Vaccine Effectiveness Research and Surveillance (SHIVERS) is to establish a hospital-based surveillance for severe acute respiratory infection (SARI) cases in Auckland and Counties Manukau District Health Boards (ADHB and CMDHB), which together provide healthcare for 838,000 people. This is an enhanced, prospective, longitudinal, population-based surveillance system. One specific aim is to measure the incidence, prevalence, demographic characteristics, clinical spectrum and outcomes for SARI cases caused by influenza and other respiratory pathogens, including intensive care unit admissions and deaths.

Surveillance involves daily screening of inpatients with suspected respiratory infections who are admitted to the public hospitals in these two DHBs overnight. An overnight admission is defined as: a patient who is admitted under a medical team, and to a hospital ward or assessment unit. The case definition used is the World Health Organization SARI definition: an acute respiratory illness with a history of fever or measured fever of ≥38°C, and cough, and onset within the past seven days, and requiring inpatient hospitalisation.

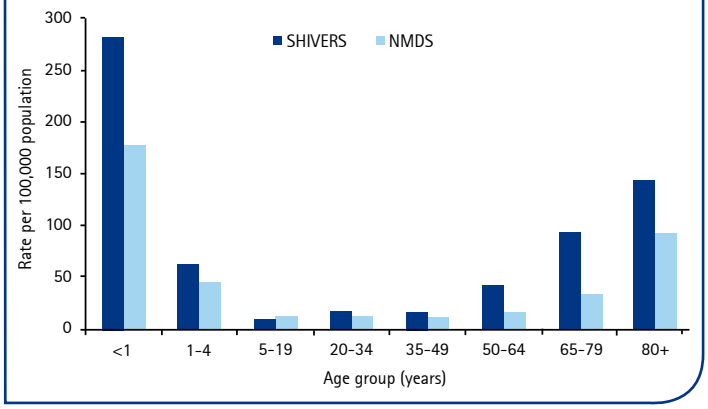
If a patient with a suspected respiratory infection meets the SARI definition, a respiratory specimen (nasopharyngeal swab or aspirate) is collected, to test for influenza and other respiratory pathogens. Patient information is collected via a case report form that captures demographics, history of presenting illness, co-morbidities, disease course and outcome and possible risk factors, including host and environmental factors.

Preliminary analysis of the first five months (May to September 2012) showed 59,124 acute admissions to ADHB and CMDHB hospitals, with assessment of 4417 patients with a suspected respiratory infection. Of these, 2023 (45.8%) met the SARI case definition. Of the 1430 SARI cases from whom nasopharyngeal specimens were collected, 324 (22.7%) had influenza viruses detected – 70 were positive for influenza B and 256 for influenza A (122 of A(H3N2), 93 of A(H1N1)pdm09, 41 A not subtyped).

Both the SHIVERS and national minimum dataset (NMDS)-coded influenza hospitalisations were highest in the less than 1 year age group (282.1 per 100,000 and 171.6 per 100,000, respectively). The high hospitalisation rate was also recorded for children aged 1 to 4

years (63.0 versus 44.1 per 100,000) (Figure 2). However, only 8% of children aged 6 months to 4 years who were hospitalised with SARI had had influenza vaccinations. The higher rates in the SHIVERS study than that of the NMDS data are likely to be due to more systematic case identification and nasopharyngeal sampling requests. Also, the International Classification of Disease-coding based surveillance used to generate the NMDS data may underestimate the burden of influenza-related hospitalisations. A retrospective cross-sectional analysis of all patients with laboratory-confirmed influenza infection at the ADHB hospital showed that the sensitivity of the NMDS-coded influenza hospitalisations (ICD-10AM-VI code I J09 and J10 as principal discharge diagnosis) was approximately 53% of laboratory confirmed influenza cases when influenza PCR positivity was used as a 'gold standard'.[3]

Figure 2. Age-specific influenza hospitalisation rates between the SHIVERS and NMDS data, May to September 2012



Our findings are consistent with trends identified in international literature showing high influenza hospitalisation rates in young children. In a 25-year US study, the influenza hospitalisation rate for children aged less than 2 years was 300–400 per 100,000[4] and 1038 per 100,000 for children aged less than 1 year in a 2004–05 Hong Kong study.[5]

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

Reported by Sue Huang, Sally Roberts, Colin McArthur, Michael Baker, Cameron Grant, Deborah Williamson, Adrian Trenholme, Conroy Wong, Susan Taylor, Lyndsay LeComte, Tim Wood, Ange Bissielo, Graham Mackereth, Don Bandaranayake, Richard Hall, Ruth Seeds, Nikki Turner, Nevil Pierse, Paul Thomas, Richard Webby, Diane Gross, Jazmin Duque, and Marc-Alain Widdowson on behalf of the SHIVERS investigation team.

4. Outbreak Surveillance

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

General

- 196 outbreaks notified in this quarter (1694 cases).
- 124 are 'final' reports (1380 cases); 72 are 'interim' reports (314 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 16.3 cases per outbreak in the previous quarter (10.5 cases per outbreak in the same quarter of last year).
- 7 hospitalisations: histamine fish poisoning, norovirus (2 cases each), *Giardia*, *Cryptosporidium*, VTEC/STEC (1 case), *Salmonella* and *Shigella* (1 case each).
- One death: norovirus.
- Two outbreaks involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to group totals.

Pathogens

- 47 norovirus outbreaks (903 cases).
- 21 *Cryptosporidium* outbreaks (64 cases).
- 20 'gastroenteritis' outbreaks (284 cases).
- 12 *Bordetella pertussis* outbreaks (36 cases).
- 10 *Giardia* outbreaks (33 cases).
- 4 *Campylobacter* outbreaks (10 cases).
- 3 *Salmonella* outbreaks (13 cases).
- 3 VTEC/STEC outbreaks (9 cases).
- 2 histamine fish poisoning outbreaks (29 cases).
- 2 *Shigella* outbreaks (5 cases).
- 1 carbon monoxide poisoning outbreak (2 cases).
- 1 ciguatera fish poisoning outbreak (2 cases).
- 1 *Yersinia* outbreak (3 cases).

Modes of Transmission

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

- 109 person-to-person, from (non-sexual) contact with an infected person (including droplets): 44 norovirus (889 cases), 19 *Cryptosporidium* (60 cases), 16 'gastroenteritis' (268 cases), 12 *B. pertussis* (36 cases), 9 *Giardia* (28 cases), 3 *Campylobacter* (8 cases), 3 VTEC/STEC (9 cases), 2 *Shigella* (5 cases), 1 ciguatera fish poisoning (2 cases), 1 histamine fish poisoning (18 cases), 1 *Salmonella* (3 cases), and 1 *Yersinia* (3 cases).
- 38 environmental, from contact with an environmental source (eg, swimming): 14 norovirus (223 cases), 14 *Cryptosporidium* (42 cases), 4 *Giardia* (15 cases), 3 'gastroenteritis' (37 cases), 2 *Campylobacter* (4 cases), 2 VTEC/STEC (7 cases), 1 carbon monoxide poisoning (2 cases), and 1 *Shigella* (3 cases).
- 10 waterborne, from consumption of contaminated drinking water: 6 *Giardia* (21 cases), 4 *Cryptosporidium* (17 cases), 1 *Salmonella* (4 cases), and 1 VTEC/STEC (5 cases).
- 8 foodborne, from consumption of contaminated food or drink (excluding water): 2 *Cryptosporidium* (8 cases), 2 *Giardia* (7 cases), 2 'gastroenteritis' (4 cases), 1 histamine fish poisoning (11 cases), 1 norovirus (4 cases), 1 *Salmonella* (6 cases), and 1 VTEC/STEC (5 cases).
- 6 zoonotic, from contact with an infected animal: 3 *Cryptosporidium* (10 cases), 2 *Giardia* (10 cases), 1 *Campylobacter* (2 cases), 1 *Salmonella* (3 cases), and 1 VTEC/STEC (5 cases).
- 7 'other' modes: 3 *Cryptosporidium* (10 cases), 3 norovirus (88 cases), and 1 carbon monoxide poisoning (2 cases).
- 4 mode of transmission unknown: 3 norovirus (14 cases) and 1 *Cryptosporidium* (2 cases).

Circumstances of Exposure

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

- 36 long term care facility: 26 norovirus (659 cases), 9 'gastroenteritis' (114 cases), and 1 histamine fish poisoning (18 cases).

- 50 home: 15 *Cryptosporidium* (47 cases), 10 *Giardia* (33 cases), 12 *B. pertussis* (36 cases), 4 *Campylobacter* (10 cases), 3 VTEC/STEC (9 cases), 2 'gastroenteritis' (12 cases), 2 *Salmonella* (7 cases), 2 *Shigella* (5 cases), 1 ciguatera fish poisoning (2 cases), 1 norovirus (3 cases), and 1 *Yersinia* (3 cases).
- 16 hospital (acute care): 13 norovirus (170 cases) and 3 'gastroenteritis' (14 cases).
- 5 childcare centre: 2 *Cryptosporidium* (6 cases), 2 'gastroenteritis' (31 cases), and 1 norovirus (15 cases).
- 3 restaurant/café/bakery: 2 norovirus (10 cases) and 1'gastroenteritis' (2 cases).
- 2 takeaways: 1 'gastroenteritis' (2 cases) and 1 *Salmonella* (6 cases).
- 1 airline: norovirus (3 cases).
- 1 caterer: norovirus (7 cases).
- 1 fast food restaurant: 'gastroenteritis' (4 cases).
- 1 school: 'gastroenteritis' (90 cases).
- 1 other institution: norovirus (24 cases).
- 9 'other setting': 6 *Cryptosporidium* (17 cases), 1 'gastroenteritis' (8 cases), 1 *Giardia* (2 cases), and 1 norovirus (15 cases).
- 9 outbreaks had 2 exposure settings recorded.
- 7 outbreaks had no exposure settings recorded.

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

- 3 home: 1 *Cryptosporidium* (3 cases); 1 *Giardia* (2 cases), and 1 norovirus (4 cases).
- 1 restaurant/café/bakery: 'gastroenteritis' (2 cases).
- 1 takeaways: *Salmonella* (6 cases),
- 3 outbreaks had no preparation settings recorded.

5. Outbreak Case Reports

Auckland measles outbreak 2011/12

Auckland experienced its largest measles outbreak for 15 years between 17 May 2011 and 11 June 2012, when 489 probable and confirmed cases were reported. The management of the Auckland measles outbreak 2011/12 (AMO 11/12) by the Auckland Regional Public Health Service (ARPHS) is discussed and key recommendations made.

An outbreak team was established, comprised of a public health physician (as the measles portfolio lead), medical officers of health, public health nurses, a communicable disease programme supervisor, a public health registrar, and support staff. An initial 'stamp it out' response was instituted, which involved intensive case and contact assessment and management. The notification of around 400 suspected cases between May and mid-September 2011 placed a considerable operational burden on the outbreak team.

The Coordinated Incident Management System (CIMS) was activated on 19 September 2011, following the notification of 21 sporadic cases over the preceding weekend. Although CIMS enabled the resources required to handle the rapidly escalating measles case rate to be provided, it was also associated with an intensive workload and some duplication of business as usual work. In addition, difficulties filling CIMS positions were encountered. A scaled-back CIMS structure, formulated by consulting key stakeholders, may be more suitable during future outbreaks.

On 12 October 2011, ARPHS adopted a revised 'manage it' response because the case notification rate remained high and a large number of the cases were sporadic. The focus for ARPHS during this time was: case notification receipt; case status determination; surveillance and intelligence regarding the regional response; and provision of information to notifiers, cases and contacts via the ARPHS website. The primary care sector assumed responsibility for case management and for providing appropriate information to contacts.

Many staff involved in AMO 11/12 thought that the transition to a 'manage it' phase should have occurred more rapidly once it was clear that the outbreak was established and was not going to be brought under control with isolation and quarantine measures. Senior staff initiated discussions with the Ministry of Health regarding a scaled-back response almost immediately after CIMS was activated. The delay of just over three weeks in moving to the 'manage it' phase was essentially the time it took to formulate a regional strategy and a comprehensive communications plan. Preparation of standing regional strategy and communications documentation ahead of another outbreak would enable a smoother transition, and should be collaboratively formulated by ARPHS, the Ministry of Health, District Health Boards (DHBs) and the primary care sector.

During AMO 11/12, a number of children who were either measles cases or contacts were advised to be excluded from school. Most cases stayed at home, but there were a number of instances where contact with other school children occurred after school. Clear messages about the meaning of isolation and quarantine need to be provided to cases and contacts through written communication and during all interactions with medical personnel.

There were 30 cases where the health professionals involved failed to notify ARPHS. Most occurred during the 'manage it' phase, when some primary care providers may not have realised that case notification was still required. All communication with health professionals, including lead maternity carers, should state clearly and upfront that notification is mandatory. The importance of timely notification should also be emphasised. This facilitates swift public health action and ensures accurate surveillance data is available to guide outbreak management. A number of notifications were delayed during AMO 11/12, including the index case where notification did not occur until almost a month after contact with primary care services, during which time several secondary cases occurred.

Delays in processing measles PCR and serology samples due to sample batching occurred until September 2011. After that date, ARPHS liaison with local laboratories led to processing of PCR and serology samples at least every second day, and usually daily if samples were received before midday. Proactive liaison with local laboratories would be desirable during future outbreaks around the frequency of sample processing and the optimal mechanism for ARPHS to communicate with laboratories regarding sample urgency.

The routine immunisation schedule was amended by the Ministry of Health on 4 October 2011. This followed a recommendation from ARPHS to allow MMR 1 delivery at 12 months and MMR 2 delivery at least one month later. Primary care providers also promoted catch-up vaccination, particularly in children less than 15 years of age. The subsequent waning of the reported measles case rate supports these public health actions. The standard immunisation schedule (with doses at 15 months and 4 years) was restored when the national outbreak officially ended in July 2012.

Ongoing health promotion messages should continue to be issued by ARPHS, the Ministry of Health, DHBs and primary health organisations to encourage timely vaccination in children and mitigate future measles outbreaks.

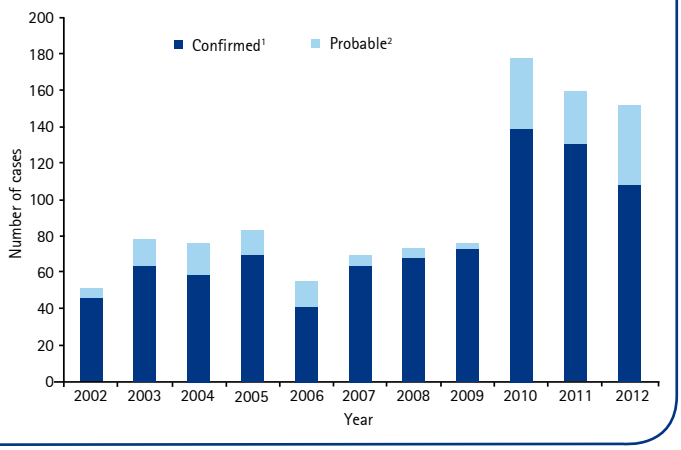
Reported by Suneela Mehta, Public Health Medicine Registrar and Richard Hoskins, Medical Officer of Health, Auckland Regional Public Health Service.

6. Laboratory Surveillance

Laboratory-based legionellosis surveillance, 2012

Legionellosis cases in New Zealand numbered 152 in 2012, based on laboratory surveillance and testing. In 2010, there was a dramatic increase in the number of laboratory-reported cases. While case numbers have decreased slightly since 2010 they remain well above the numbers reported between 2002 and 2009 (Figure 3). No cause for the increase has been identified, but the increased use of nucleic acid amplification testing (NAAT), rather than traditional antibody serology methods, may have contributed. .

Figure 3. Number of laboratory-proven legionellosis cases, 2002 to 2012



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

[2] A probable case is defined as having a clinically compatible illness and either a positive *Legionella* NAAT result or a single antibody titre >256 by IFA test.

Incidence rates for DHBs ranged from 2.0 per 100,000 population (Capital & Coast) to 10.6 per 100,000 (Canterbury). Fifty three cases (34.9%) were reported from the Canterbury DHB alone, mostly associated with compost or potting mix exposure.

Legionella longbeachae (77 cases, 50.7%) and *L. pneumophila* (51 cases, 33.6%) were the most prevalent causative agents in 2012. Source tracing identified 64 (42.1%) cases with exposure to compost, potting mix or other gardening activity during the incubation period. Of these, 57 cases were *L. longbeachae* infections. Numbers of *L. longbeachae* infections regularly increase from early spring, reach a maximum in mid-summer and fall to a low in late autumn, coinciding with seasonal gardening activity.

A prolonged cluster of 22 *L. longbeachae* cases following exposure to compost or potting mix was identified in the Christchurch area from September to December 2012 (2 cases in September, 1 in October, 11 in November and 8 in December). This seasonal clustering was also seen in the Christchurch area at the same time in 2010 (17 cases) and 2011 (20 cases).

A further cluster caused by *Legionella pneumophilia* serogroup 1 was identified in the greater Auckland area between February and June 2012, involving 19 cases with two deaths. No sources were identified. Usually there are only one to two *L. pneumophilia* serogroup 1 cases identified per month in the greater Auckland area.

Source tracing has highlighted *Legionella* species other than *L. Longbeachae* haboured by compost: *L. micdadei, L. pneumophilia* and *L. sainthelensi* (2 cases each). However, the exposure source for the 51 *L. pneumophila* cases was identified for only 12 cases: spa pools (2 cases), compost (2 cases each) and foreign travel (8 cases).

Diagnosis by laboratory culture remains the gold standard for legionellosis and all laboratories are encouraged to culture respiratory samples from patients suspected of being infected. In 2012, 28 cases were confirmed by culture, and a further 80 confirmed following either a positive *Legionella* urinary antigen test (21 cases), a four-fold or greater rise in antibody titres (22 cases), antibody titres greater than 512 on more than one occasion (35 cases), or a NAAT-positive test on acute phase samples and a serologically positive test on convalescent samples (2 cases), giving a total of 108 cases meeting the confirmed case definition. A diagnosis based only on a positive NAAT result is defined as probable. Of the 152 laboratory-proven cases in 2012, 60 were initially detected on the basis of a positive NAAT result. After further supporting laboratory tests (usually culture and/or serology) most cases were confirmed, but 27 remained probable – a large increase in numbers from 2002 to 2009, when two to three probable cases were diagnosed each year based on positive NAAT results. A further 17 cases remained probable on the basis of a single elevated antibody titre of at least 512, giving a total of 44 cases meeting the probable case definition. Laboratories and public health units are encouraged to send samples from probable cases for follow-up testing to reduce these numbers.

Since molecular methods are much more sensitive than culture methods, increasing use of NAAT testing is highlighting the historical under-reporting of legionellosis. Issues with false-positive results associated with the method, however, mean that any positive result needs to be interpreted with caution and appropriate follow-up testing carried out to confirm the diagnosis and identify the infecting species.

ESR acknowledges Canterbury Health Laboratories for the molecular identification of NAAT-positive cases from the Canterbury DHB. This has significantly reduced the number of legionellosis cases with no identified infectious agent compared with 2011 data.

For supplementary material see – www.surv.esr.cri.nz/surveillance/NZPHSR.php

Reported by David Harte, Health Programme, ESR.

Mycology

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

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