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New Zealand Public Health Surveillance Report

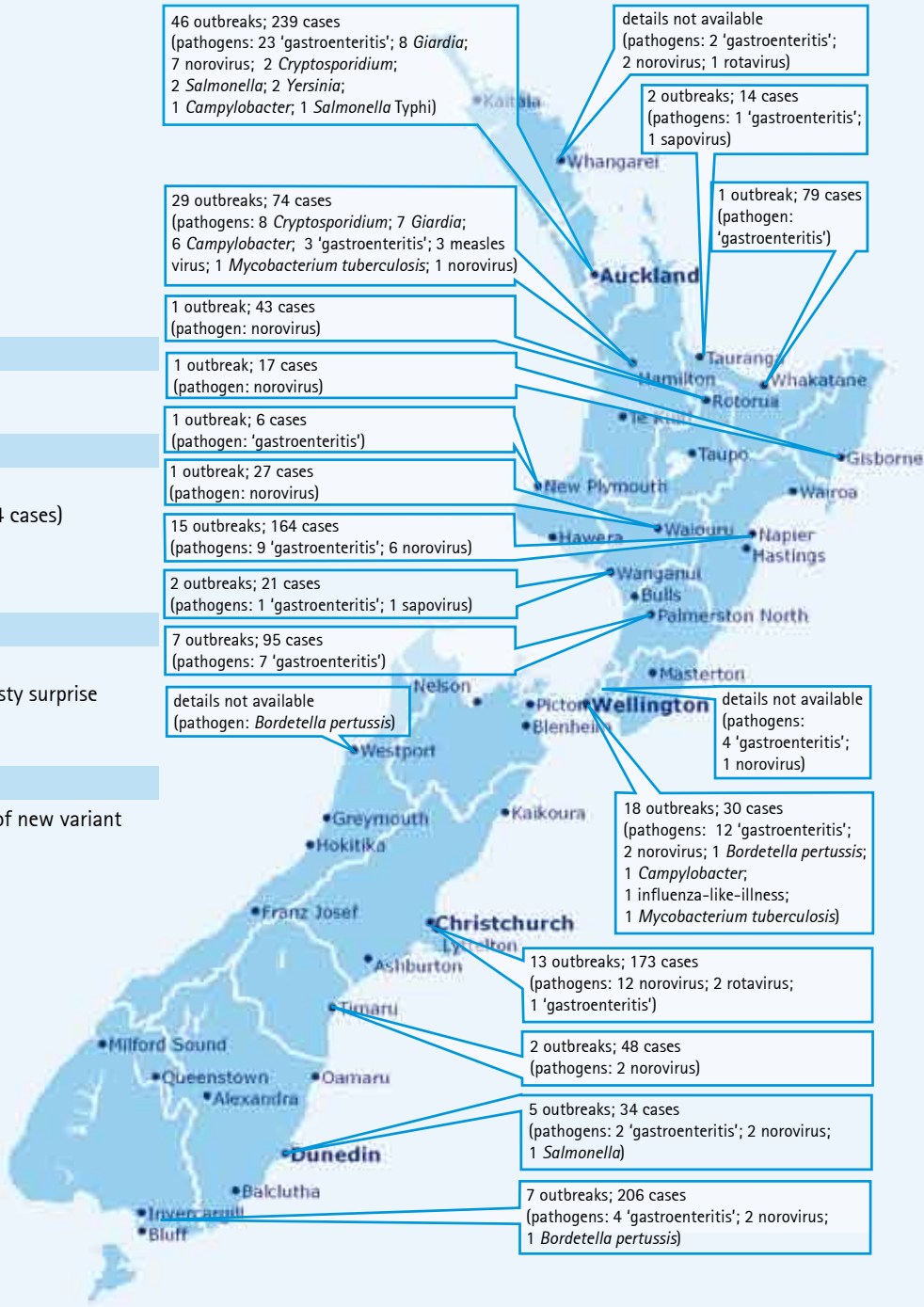
December 2011: Covering July to September 2011

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 2011. 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 October 2011. Outbreaks reporting exposures in more than one geographic location are assigned to the health district with the most cases. Two outbreaks involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to totals.



1. Editorial

SHIVERS: The Southern Hemisphere Influenza Vaccine Effectiveness Research and Surveillance project

Introduction

In December 2010, the United States (U.S.) Department of Health and Human Services published a request for research proposals from the National Centre for Immunization and Respiratory Diseases, Centres for Disease Control and Prevention (CDC). The research was entitled, "Influenza and Other Respiratory Diseases in the Southern Hemisphere", and the request called for cooperative agreements with organisations working in the Southern hemisphere to conduct research studies on the disease burden, epidemiology, transmission, risk factors for severe illness, effectiveness of vaccination, and effectiveness of other preventive strategies for influenza and other respiratory diseases of public health importance. The preamble to the request stated that countries in the Southern hemisphere could provide critical information on the above at a time when study sites in the Northern hemisphere cannot, and that such information provided on a routine basis could be regarded as an early warning system.

ESR, as the lead institution, in collaboration with Auckland District Health Board, Otago University, St Jude Children's Hospital in Memphis and Auckland University, submitted a grant application that presented an integrated series of observational studies to achieve the given objectives over a 5-year period.

Following a rigorous peer-review process that involved assessing other applications from the Southern hemisphere New Zealand was awarded the 5-year, multi-million dollar contract. The U.S.-based scientific review panel considered the application to be exceptional. A Notice of Award has been received with a funding allocation to cover the first year of the research. Funding for subsequent years will be subject to performance appraisal. The award will enable ESR and its collaborators to conduct research into influenza and other respiratory diseases in Auckland for 5 years beginning 30 September 2011, in a cooperative agreement with CDC and funded by the U.S. Health and Human Services. Auckland was selected for the study based primarily on its population size. The CDC will be an integral part of the activities within the research programme.

Research objectives

During the first year the programme will focus on the following two primary research objectives.

1. Estimate the incidence rate, prevalence, clinical spectrum, pathogenesis and outcomes of severe pneumonia and severe acute respiratory infection (SARI) caused by influenza and other respiratory pathogens in the study population and subpopulations.
2. Assess the annual effectiveness and/or efficacy of influenza vaccines in preventing laboratory-confirmed influenza in the study population and subpopulations.

In subsequent years, and subject to performance, the following further seven objectives will be explored.

1. Investigate the interaction between influenza and other respiratory/non-respiratory infections.
2. Understand aetiologies of respiratory mortality.
3. Estimate annual incidence and attack rates of non-severe illness due to influenza and other respiratory pathogens in population and subpopulations.
4. Estimate the annual risk of infection with influenza among population subgroups using serologic methods.
5. Identify and quantify the impact of various risk factors on influenza infection or severe disease.
6. Describe the immune response to influenza infection and vaccination, and compare the level, duration and cross-reactivity of the immune response in subgroups with risk factors for influenza disease.
7. Estimate the healthcare and societal economic burden of influenza and other respiratory pathogens and the cost-effectiveness of influenza vaccination among different subpopulations.

Research outcomes

These comprehensive studies on the epidemiology, aetiology, immunology of influenza and related respiratory infections, and vaccine effectiveness will contribute to many desirable outcomes. The studies will:

- provide guidance to improve methods for disease surveillance
- assist in early detection and prediction
- optimise clinical case management
- optimise laboratory diagnosis
- guide better vaccine design
- guide targeted vaccination strategies for populations and subgroups
- help in understanding the host immune response
- identify better immune diagnostic markers
- guide non-pharmaceutical interventions and preventive measures.

Following confirmation of funding, the SHIVERS team has begun discussions with the Auckland District Health Boards and the primary health sector in order to plan the implementation of the project. The surveillance of hospitalised SARI cases for the first objective is scheduled to commence with a trial run in March 2012.

2. Notifiable Disease Surveillance

The following is a summary of disease notifications for the July to September quarter of 2011 and cumulative notifications and rates calculated for a 12-month period (October 2010 to September 2011). 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 5 October 2011. 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:* 221 notifications in the quarter (2010, 218); 527 notifications over the last 12 months (2010, 599), giving a rate of 12.1 cases per 100,000 population (2010, 13.7), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (133 cases). Cases were aged between 1 month and 95 years, with 8 cases under the age of 2 years.

Measles

- *Notifications:* 192 notifications in the quarter (2010, 8); 301 notifications over the last 12 months (2010, 59), giving a rate of 6.9 cases per 100,000 population (2010, 1.4), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (71 cases) and from the same quarter last year (8 cases). 133 cases were laboratory confirmed.

Mumps

- *Notifications:* 20 notifications in the quarter (2010, 8); 61 notifications over the last 12 months (2010, 50), giving a rate of 1.4 cases per 100,000 population (2010, 1.1), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (8 cases). 10 cases were laboratory confirmed.

Pertussis

- *Notifications:* 418 notifications in the quarter (2010, 207); 976 notifications over the last 12 months (2010, 1084), giving a rate of 22.3 cases per 100,000 population (2010, 24.8), a statistically significant decrease.

- *Comments:* there has been a statistically significant increase from the previous quarter (180 cases) and from the same quarter last year (207 cases).

Rubella

- *Notifications:* 12 notifications in the quarter (2010, 1); 23 notifications over the last 12 months (2010, 2), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (1 case). 9 cases were laboratory confirmed.

INFECTIOUS RESPIRATORY DISEASES

Meningococcal Disease

- *Notifications:* 56 notifications in the quarter (2010, 29); 116 notifications over the last 12 months (2010, 104), giving a rate of 2.7 cases per 100,000 population (2010, 2.4), not a statistically significant increase.
- *Comments:* there has been a statistically significant increase from the previous quarter (25 cases) and from the same quarter last year (29 cases). Cases were distributed by age as follows: 13 (<1 year), 15 (1–4 years), 5 (5–14 years), and 23 (15 years and over). 16 cases were the epidemic strain.

ENTERIC INFECTIONS

Campylobacteriosis

- *Notifications:* 1627 notifications in the quarter (2010, 1738); 6500 notifications over the last 12 months (2010, 7758), giving a rate of 148.8 cases per 100,000 population (2010, 177.6), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (1315 cases) and a statistically significant quarterly decrease from the same quarter last year (1738 cases).

Gastroenteritis

- *Notifications:* 143 notifications in the quarter (2010, 119); 626 notifications over the last 12 months (2010, 507), giving a rate of 14.3 cases per 100,000 population (2010, 11.6), a statistically significant increase.
- *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:* 207 notifications in the quarter (2010, 289); 1140 notifications over the last 12 months (2010, 1096), giving a rate of 26.1 cases per 100,000 population (2010, 25.1), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (268 cases) and from the same quarter last year (289 cases).

VTEC Infections

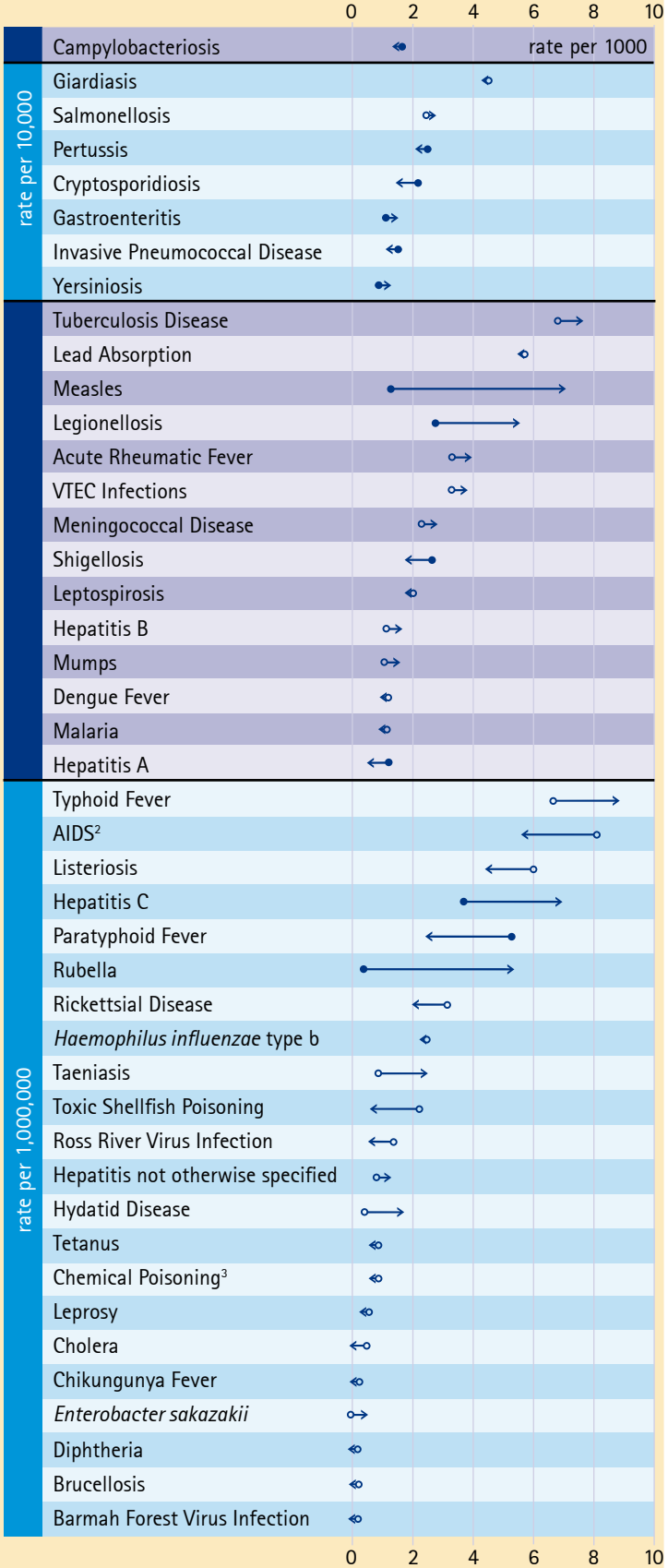
- *Notifications:* 22 notifications in the quarter (2010, 40); 157 notifications over the last 12 months (2010, 146), giving a rate of 3.6 cases per 100,000 population (2010, 3.3), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (46 cases) and from the same quarter last year (40 cases).

Yersiniosis

- *Notifications:* 184 notifications in the quarter (2010, 96); 519 notifications over the last 12 months (2010, 396) giving a rate of 11.9 per 100,000 population (2010, 9.1), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (86 cases) and from the same quarter last year (96 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 2010 to September 2011 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.

ENVIRONMENTAL EXPOSURES & INFECTIONS

Cryptosporidiosis

- *Notifications:* 212 notifications in the quarter (2010, 267); 641 notifications over the last 12 months (2010, 1013), giving a rate of 14.7 cases per 100,000 population (2010, 23.2), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (79 cases) and a statistically significant quarterly decrease from the same quarter last year (267 cases).

Legionellosis

- *Notifications:* 84 notifications in the quarter (2010, 35); 235 notifications over the last 12 months (2010, 120), giving a rate of 5.4 cases per 100,000 population (2010, 2.7), a statistically significant increase.
- *Comments:* there has been a statistically significant increase from the previous quarter (25 cases) and from the same quarter last year (35 cases). 57 notifications from this quarter remain under investigation, a proportion of these will not be confirmed as cases and will be denotified.

NEW, EXOTIC & IMPORTED INFECTIONS

Hepatitis A

- *Notifications:* 9 notifications in the quarter (2010, 12); 25 notifications over the last 12 months (2010, 55), giving a rate of 0.6 cases per 100,000 population (2010, 1.3), a statistically significant decrease.
- *Comments:* cases were aged between 14 months and 44 years, with 4 cases under the age of 16 years. Overseas travel information was recorded for 8 cases. Of these, 3 cases had not travelled overseas during the incubation period.

Paratyphoid Fever

- *Notifications:* 1 notification in the quarter (2010, 8); 11 notifications over the last 12 months (2010, 23), giving a rate of 0.3 cases per 100,000 population (2010, 0.5), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (8 cases). This case was overseas during the incubation period.

Shigellosis

- *Notifications:* 26 notifications in the quarter (2010, 34); 81 notifications over the last 12 months (2010, 119), giving a rate of 1.9 cases per 100,000 population (2010, 2.7), a statistically significant decrease.
- *Comments:* overseas travel information was recorded for 9 cases. Of these, one case had not travelled overseas during the incubation period and had no prior history of travel that could account for their infection.

Taeniasis

- *Notifications:* 5 notifications in the quarter (2010, no cases); 10 notifications over the last 12 months (2010, 4), not a statistically significant increase.
- *Comments:* there has been a statistically significant increase from the same quarter last year (no cases). All cases were overseas during the incubation period. Countries visited or resided in were Ethiopia (2 cases), Myanmar (2 cases), and South Africa (1 case).

BLOOD- AND TISSUE-BORNE INFECTIONS

Hepatitis C

- *Notifications:* 10 notifications in the quarter (2010, 5); 30 over the last 12 months (2010, 16) giving a rate of 0.7 cases per 100,000 population (2010, 0.4), a statistically significant increase.
- *Comments:* cases were aged between 16 and 58 years.

3. Other Surveillance Reports

Invasive pneumococcal disease, 2010

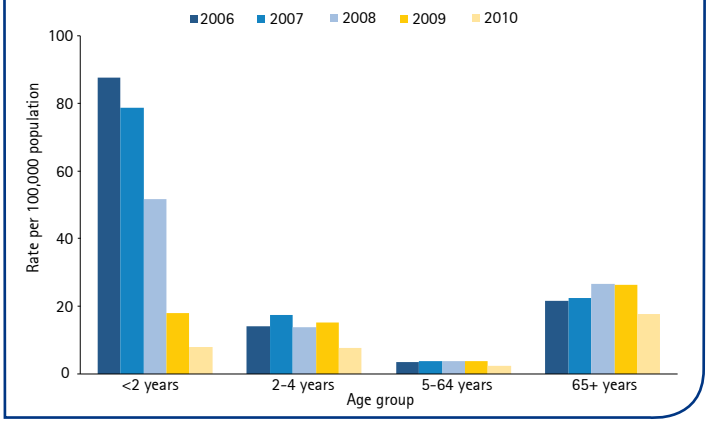
A four-dose schedule of the 7-valent pneumococcal conjugate vaccine (PCV7), Prevenar®, was added to the New Zealand childhood immunisation schedule in June 2008, with a catch-up programme available for all children born on or after 1 January 2008. Since 17 October 2008, invasive pneumococcal disease (IPD) has been notifiable to medical officers of health under the Health Act 1956.

In 2010, 535 cases of IPD were notified, which equates to an annual incidence rate of 12.2 cases per 100,000 population. For 514 (96.1%) of the 535 notified cases, a *Streptococcus pneumoniae* isolate from an invasive site was received by ESR for serotyping and antimicrobial susceptibility testing.

The incidence of IPD in infants aged less than 2 years has reduced 70.9% since the introduction of PCV7, from an average annual incidence of 100.4 cases per 100,000 population in 2006 and 2007 to 29.2 cases per 100,000 population in 2010. The reduction in IPD caused by PCV7 serotypes in this age group is even more striking than the reduction in all IPD, with a 90.5% decrease from an average annual incidence of 83.2 cases per 100,000 population in 2006 and 2007 to 7.9 cases per 100,000 population in 2010 (Figure 1). The actual reductions in disease rates may be greater than these rates indicate because the 2010 rates are based on IPD notifications, whereas the rates for 2006 and 2007 are based on case numbers captured by ESR's national laboratory-based surveillance of invasive pneumococcal isolates, which, compared with notifications, is likely to underestimate the burden of IPD.

In 2010, IPD also decreased in the 2–4 years age group, from a rate of 23.0 cases per 100,000 population in 2009 to 15.1 cases per 100,000 population. This is as expected, as some of the vaccine-eligible children would have been in this age group in 2010 (ie, the 2-year-old children born throughout 2008). Notably in 2010, for the first time there was evidence of the indirect or herd immunity effect of PCV7 infant immunisation, with a significant ($p \leq 0.05$) decrease in the rate of IPD due to PCV7 serotypes in the 65 years and older age group from 26.4 to 17.7 cases per 100,000 population (Figure 1) between 2009 and 2010.

Figure 1. Rates of invasive pneumococcal disease caused by PCV7 serotypes, by age group each year 2006 to 2010



In 2010, the age-standardised rates of IPD among Pacific Peoples (53.1 cases per 100,000 population) and Māori (32.0 cases per 100,000 population) were 5.9- and 3.6-times, respectively, the rate among Europeans (9.0 cases per 100,000 population). The rate of disease in the most deprived New Zealand Deprivation Index 2006 (NZDep2006) quintile (9–10) was 3.1-times that in the least deprived NZDep2006 quintile (1–2). There were no significant regional differences in the incidence of IPD in 2010, but within the Northern region disease rates were significantly higher in Counties Manukau District Heath Board (DHB) than in the other three DHBs in the region.

The all-age rate of pneumococcal meningitis was 0.7 cases per 100,000 population in 2010. The highest rate of meningitis occurred in the less than 1 year age group (7.8 cases per 100,000 population). The case-fatality rate was 5.3%. Among the IPD cases for whom the information was reported, 52.8% were recorded as having a chronic illness, 52.6% of cases aged less than 5 years were in childcare, and 42.9% of cases aged less than 5 years were exposed to smoking in the household.

As with all vaccines that target only specific types, there is concern that pneumococcal serotypes not included in PCV7 will increase and essentially 'replace' vaccine types as the principal cause of IPD. There has been some increase in IPD caused by non-PCV7 serotypes since the introduction of PCV7. This increase has been predominantly due to serotype 1 disease among Māori and Pacific People in the 5–34 years age group. However, this increase in serotype 1 disease is unlikely to be a result of serotype replacement, as the increase in this type commenced in 2007 (ie, before the vaccine was introduced) and case numbers now appear to be waning after peaking in 2009. In addition, serotype 1 disease has been associated mainly with age groups who are not eligible for PCV7 vaccination. Globally, this serotype is often associated with outbreaks that occur cyclically every few years.

Serotype 19A is the non-PCV7 type that is most frequently reported to have increased in other countries following the introduction of the vaccine. In New Zealand there have been no significant changes in the rate of disease due to serotype 19A in any age group. There was, however, a notable but not significant increase in the rate of serotype 19A disease in the 65 years and over age group in 2010.

Although there was a decrease in penicillin and cefotaxime resistance between 2008 and 2009, there was no further decrease between 2009 and 2010. In 2010, 18.1% of isolates were categorised as penicillin resistant according to the Clinical and Laboratory Standards Institute's meningitis interpretive criteria. No isolates were categorised as penicillin resistant according to the interpretive criteria for the parenteral treatment of non-meningitis infections. Two percent of isolates were cefotaxime resistant according to the meningitis interpretive criteria, and 1.6% of isolates were cefotaxime resistant according to the non-meningitis interpretive criteria. There is no indication that resistance is increasing in non-PCV7 serotypes in this country, with PCV7 types still accounting for over 80% of the penicillin and cefotaxime resistance in 2010.

A more detailed report is available at http://www.surv.esr.cri.nz/surveillance/IPD.php

Reported by Helen Heffernan, Health Programme, ESR.

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 2011). Comparisons are made to the previous quarter (April to June 2011), and to the same quarter in the previous year (July to September 2010). Note that the outbreak data in this section are notified to ESR by the Public Health Services.

General

- 162 outbreaks notified in this quarter (1280 cases).
- 85 are 'final' reports (1016 cases); 77 are 'interim' reports (264 cases) that have yet to be finalised and closed.

All data that follow relate to final reports only.

- 12.0 cases on average per outbreak, compared with 15.2 cases per outbreak in the previous quarter (9.9 cases per outbreak in the same quarter of last year).
- 10 hospitalisations: norovirus (5 cases), *Bordetella pertussis* (2 cases), *Salmonella* Typhi (2 cases) and *Salmonella* (1 case).
- No deaths.
- Two outbreaks involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to totals.

Pathogens

- 32 norovirus outbreaks (700 cases).
- 24 'gastroenteritis' outbreaks (220 cases).
- 13 *Giardia* outbreaks (30 cases).
- 4 *Campylobacter* outbreaks (13 cases).
- 4 *Cryptosporidium* outbreaks (8 cases).
- 3 *Salmonella* outbreaks (6 cases).
- 2 *B. pertussis* outbreaks (7 cases).
- 2 rotavirus outbreaks (29 cases).
- 2 sapovirus outbreaks (30 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.

- 61 person-to-person, from (non-sexual) contact with an infected person (including droplets): 30 norovirus (687 cases), 12 *Giardia* (28 cases), 8 'gastroenteritis' (88 cases), 3 *Cryptosporidium* (6 cases), 2 *B. pertussis* (7 cases), 2 *Campylobacter* (4 cases), 2 rotavirus (29 cases), 2 *Salmonella* (4 cases), 1 *S.* Typhi (2 cases), and 1 sapovirus (16 cases).
- 18 environmental, from contact with an environmental source (e.g., swimming): 12 norovirus (350 cases), 3 *Giardia* (7 cases), 2 'gastroenteritis' (13 cases), 2 rotavirus (29 cases), and 1 *Salmonella* (2 cases).
- 19 foodborne, from consumption of contaminated food or drink (excluding water): 12 'gastroenteritis' (36 cases), 3 *Campylobacter* (11 cases), 1 *Cryptosporidium* (2 cases), 1 norovirus (8 cases), 1 *Salmonella* (2 cases), and 1 sapovirus (14 cases).
- 6 waterborne, from consumption of contaminated drinking water: 2 *Campylobacter* (9 cases), 2 *Giardia* (4 cases), and 2 *Salmonella* (4 cases).
- 6 zoonotic, from contact with infected animal: 2 *Giardia* (4 cases), 2 *Salmonella* (4 cases), 1 *Campylobacter* (2 cases), and 1 *Cryptosporidium* (2 cases).
- 2 'other' mode: 1 *Campylobacter* (7 cases) and 1 *S.* Typhi (2 cases).
- 7 mode of transmission unknown: 5 'gastroenteritis' (104 cases), 1 *Giardia* (2 cases), and 1 norovirus (5 cases).

Circumstances of Exposure

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

- 18 long term care facility: 12 norovirus (394 cases), 5 'gastroenteritis' (66 cases), and 1 sapovirus (16 cases).
- 17 home: 11 *Giardia* (26 cases), 2 *B. pertussis* (7 cases), 2 *Cryptosporidium* (4 cases), 1 'gastroenteritis' (2 cases), and 1 *S.* Typhi (4 cases).
- 14 hospital (acute care): 12 norovirus (157 cases), 2 'gastroenteritis' (13 cases), and 2 rotavirus (29 cases).
- 12 restaurant/café/bakery: 7 'gastroenteritis' (18 cases), 3 norovirus (24 cases), 1 *Campylobacter* (2 cases), and 1 sapovirus (14 cases).
- 5 farm: 2 *Cryptosporidium* (4 cases), 2 *Salmonella* (4 cases), and 1 *Campylobacter* (2 cases).
- 4 childcare centre: 2 norovirus (64 cases), 1 *Cryptosporidium* (2 cases), and 1 'gastroenteritis' (9 cases).
- 2 marae: 1 *Campylobacter* (2 cases) and 1 'gastroenteritis' (7 cases).
- 2 other institution: 2 norovirus (56 cases).
- 2 workplace: 1 'gastroenteritis' (6 cases) and 1 *S.* Typhi (2 cases).
- 1 fast food restaurant: 'gastroenteritis' (4 cases).
- 1 school: 'gastroenteritis' (79 cases).
- 1 supermarket/delicatessen: 'gastroenteritis' (2 cases).
- 1 takeaways: 'gastroenteritis' (2 cases).
- 2 'other setting': 1 *Campylobacter* (7 cases) and 1 *Giardia* (2 cases).
- 3 outbreaks had two exposure settings recorded.
- 6 outbreaks had no exposure settings recorded.

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

- 4 restaurant/café/bakery: 2 'gastroenteritis' (4 cases), 1 *Campylobacter* (2 cases), and 1 sapovirus (14 cases).
- 2 takeaways: 2 'gastroenteritis' (6 cases).
- 1 home: 'gastroenteritis' (2 cases).
- 12 outbreaks had no preparation settings recorded.

5. Outbreak Case Reports

West Coast pertussis outbreak

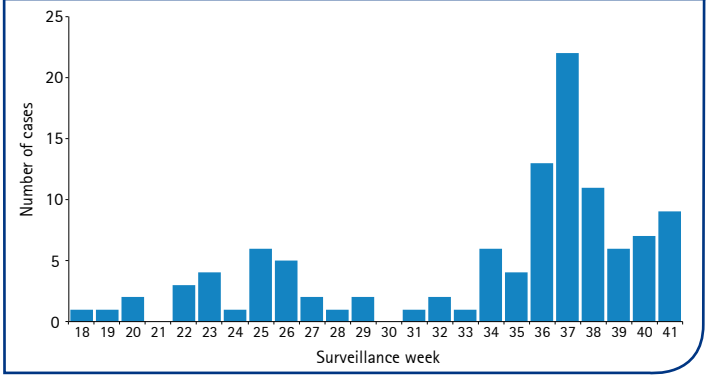
Pertussis, or whooping cough, is a vaccine-preventable disease caused by the bacterial agent *Bordetella pertussis.* Since May 2011, the number of pertussis notifications in the West Coast region has risen. The increase in notifications and confirmed cases of pertussis was initially centred in and around Hokitika in the Westland District but cases are now occurring elsewhere on the Coast.

Between 1 May and 14 October 2011, Community & Public Health West Coast received 231 notifications of suspected pertussis infection. Of these, 110 are either confirmed or probable cases with a further eight cases still under investigation. For this period, the overall incidence rate for confirmed and probable cases of pertussis on the West Coast was 350 cases per 100,000 population.

Initially, a high proportion of the cases were notified to Community & Public Health West Coast through the direct laboratory notification process. Notification on suspicion of infection is now occurring in most cases.

An initial peak in the outbreak occurred in week 25, followed by a decline in case numbers around the school holidays in weeks 28 and 29 (Figure 2). After week 33, case numbers rose again, with the shape of the epidemic curve suggesting a community-wide outbreak consistent with person-to-person transmission of pertussis from the initial clusters. The recent apparent decrease in case numbers may not be maintained once laboratory test results are available for cases currently under investigation. Although it appears the outbreak may be beginning to decline in Westland, the numbers of cases in other districts in the West Coast region have increased in recent weeks.

Figure 2. Number of confirmed and probable pertussis cases by surveillance week, 1 May to 14 October 2011



Of the 110 confirmed or probable cases, 50 were male and 60 were female. The median age of the cases was 23.8 years (range 14 months to 73 years). So far, the 1–4 years and 5–9 years age groups have experienced the highest rates, followed by the 15–19 years age group. As at 14 October 2011, no confirmed or probable cases have been notified in the less than 1 year age group. The highest number of disease notifications occurred among those of New Zealand European ethnicity with 80 (72.7%) cases, followed by Māori (24 cases, 21.8%), Asian (4 cases, 3.6%), and Pacific Peoples (2 cases, 1.8%) ethnicities. Three cases have been hospitalised for disease complications so far, with one requiring intensive care. Since 1 May 2011, cases have been reported in four early childhood centres and nine schools.

Control measures

Early in the outbreak, Community & Public Health West Coast sent out an alert to general practitioners with advice about diagnostic testing and case management, and a reminder about the importance of on-time vaccination. The public health unit is also working closely with primary care and the medical centre dealing with most of the cases so far, and has provided information to schools and early childhood centres across the region. Pertussis information pamphlets have been distributed to pharmacies and supermarkets. An outbreak team is operating, and it includes staff from Community & Public Hēalth's Christchurch office and the West Coast District Health Board. Media releases are being done weekly with key messages highlighting the importance of on-time vaccination and seeking early medical attention for pertussis symptoms. A targeted booster vaccination campaign was been rolled out at the start of week 41 providing free vaccinations for healthcare workers in contact with infants and young children, early childhood workers and parents of babies aged less than 6 months.

Reported by Steffan Cavill-Fowler, Trainee Health Protection Officer and Cheryl Brunton, Medical Officer of Health, Community & Public Health West Coast, Greymouth.

Wellington *Campylobacter* outbreak – liver delivers nasty surprise

Background

Campylobacteriosis is the most commonly notified foodborne/enteric disease in New Zealand, with 7346 cases (a rate of 168.2 cases per 100,000 population) notified nationally for the year January to December 2010. New Zealand has a high incidence of notified campylobacteriosis compared with other developed countries,[1,2] however, outbreaks are relatively rare. Outbreaks in New Zealand have been associated with various chicken meals including liver paté, garlic butter, unpasteurised milk, cucumber and contaminated drinking-water supplies.[3]

Regional Public Health (RPH) noted an increase in campylobacteriosis notifications in the Wellington region from 1 May to 31 August 2011 compared with the same time period in the previous 3 years. This increase was also identified by ESR through the Early Aberration Reporting System and RPH was advised. The increase in campylobacteriosis notifications appeared to be isolated to the Wellington region.

Method

Regional Public Health follows up campylobacteriosis notifications in two ways:

1. high risk cases are referred to the local authority's environmental health officers who complete case interviews
2. all other cases are sent information and a self-completion questionnaire which they are encouraged to complete and return to RPH.

The response rate for the self-completion questionnaires for this outbreak was approximately 30%.

Regional Public Health instigated additional surveillance of notified cases and, when sources were identified, a series of investigations. EpiSurv data on all confirmed cases for the period 1 May to 31 August 2011 were analysed to identify any trends (geographic location, demographics, risk factors). In addition, the risk factor information provided by cases, particularly high risk foods and retail premises, was reviewed.

Furthermore, on 15 August 2011, RPH began interviewing all notified campylobacteriosis cases by telephone. Some telephone interviews were also completed on cases notified in early August. These interviews continued until 15 September 2011 when case numbers returned to the historical trend for this time of year.

Findings

From 1 May to 31 August 2011, RPH received 345 campylobacteriosis notifications compared with 294 notifications for the same period in 2010. In August 2011, 110 cases were notified compared with 66 cases for August 2010. From 15 to 31 August 2011, 62 cases were interviewed by telephone.

Analysis of the EpiSurv data over the three-month period did not reveal any significant commonalities in age, sex or geographical distribution. Risk factor information was available for 186 (53.9%) of the 345 cases, with the most common risk factor being consumption of food at a retail premises. Of these 186 cases, 26 (14.0%) specifically reported consuming liver products from chickens or lambs, including whole or sliced cooked livers, liver mousse or paté, from food premises within the incubation period. Several cases self-reported consuming lamb's fry, even though this question was not specifically asked in the self-completion questionnaire.

Further information gathered from these 26 cases revealed multiple links with 13 independent food retail premises in the Wellington region, all manufacturing and/or serving chicken or mammalian livers, or liver products. The only common factor among the premises was that they were serving these high risk foods. Five premises were linked to more than one notified case, resulting in site investigations and assessments of cooking processes. Hazard analysis critical control point reviews at these premises identified that undercooking livers was a significant risk factor. In one case, RPH Food Act Officers initiated a full trade- and consumer-level recall of a chicken liver mousse product. Corrective actions and education regarding safe

cooking of livers were provided, and retail premises were also reminded of their legal obligations and advised that further non-compliance causing illness may result in legal action.

A further eight retail premises that were linked to a single notified case each, were contacted by phone, and emailed information about risks and controls regarding liver products and campylobacteriosis.

Food handling staff at premises were aware of the risks associated with chicken livers, but were not actively ensuring the critical control points were being achieved. Food handlers were not aware of the similar risks and controls needed for mammalian livers.

All 13 premises continue to be closely monitored for ongoing compliance.

Discussion

The increase in campylobacteriosis notifications in the Wellington region from May to August 2011 (in particular August) was markedly high compared to the same time in previous years. The lengthy incubation period for *Campylobacter* makes identifying sources of illness challenging, so it was critical in this dispersed outbreak that a number of cases self-reported the consumption of lamb's fry and chicken liver products. It appears that the consumption of these high risk foods was a significant factor in the increase in campylobacteriosis in the region. Changes have been made to the RPH self-completion questionnaires to include questions about contact with chicken and mammalian livers.

The active investigation of all notified cases implemented in August, was invaluable in establishing a common link with consumption of liver products, and this allowed a greater capacity to review and analyse other risk factors. While this process was highly resource intensive, it can be implemented again during times of unexpected increases in common enteric illnesses.

Discussion with personnel associated with the food premises suggests there is an increasing customer demand for liver-based foods with many premises reporting it as the most commonly ordered meal. However, premise investigations highlighted a low level of awareness about the risk of *Campylobacter* contamination of mammalian livers. Operators of food premises were failing to comply with best practice associated with cooking liver. Some retailers believed that undercooking lamb's liver presented a lower risk of gastro-intestinal illness than that of undercooking red meat. Many retailers were unaware of the process of liver extraction and associated bacterial loading during primary processing of both poultry and mammalian livers.

The risks of *Campylobacter* associated with offal have been documented by ESR, 2 and RPH believes these risks should be more widely communicated to the food sector and regulators. A number of the premises chose to remove lamb's fry from their menus once they became aware of the risk.

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

Reported by Carolyn Wilson, Loushy Mangalasseril and Sally Giles, Health Protection & Food Act Officers, Regional Public Health.

Meningococcal C disease in Northland, 2011

Background

Invasive meningococcal disease, caused by the gram-negative diplococcus bacteria *Neisseria meningitides*, is a serious illness commonly presenting as meningitis and/or septicaemia. The case-fatality rate in New Zealand over the last decade has varied from 4 to 10%.[1] The bacteria can be differentiated into groups according to the chemical and immunological properties of its capsular polysaccharide. The most common groups causing human disease are A, B, C, W135 and Y, with groups B and C most common in New Zealand.

During the 1990s through to 2004, Northland's children were disproportionately affected by the New Zealand group B meningococcal disease epidemic. The group B meningococcal disease strain B:4:P1.7b,4 predominated nationally over other strains during this time, reaching a peak of 200 cases per 100,000 population in 2001 in children aged less than 1 year.[2] In Northland, rates peaked at approximately 250 cases per 100,000 population in children aged less than 1 year, with a total population meningococcal disease rate of 25 cases per 100,000 population per year in the period 2001 to 2003. Following the vaccination campaign with the group B meningococcal vaccine (MeNZB) from 2004 to 2005 and the rapid decline in cases, meningococcal activity has been at lower levels in Northland (5 to 23 cases per 100,000 population per year in those aged less than 20 years) from 2005 to 2010. This rate is considered high compared to other developed countries. Group B meningococcal disease has continued to predominate and only seven confirmed cases of group C meningococcal disease were recorded in the 10-year period, from 2001 to 2010.

Current situation

In 2011, the first case of invasive meningococcal disease in Northland was notified on 10 July 2011 and was typed as serogroup C, serotype 2a PorA 1.5, 10-8. Unusually, three further cases of group C meningococcal disease followed within a month. In the period up to 24 October 2011, a total of 12 confirmed cases of invasive meningococcal disease have been notified in Northland. Of these, three cases were group B meningococcal disease and nine cases were group C meningococcal disease (all serotype 2a PorA 1.5). Of the nine cases of group C meningococcal disease, three cases were Māori and six cases were Pākehā. Eight cases were aged between 1 year and 18 years. The rate of group C meningococcal disease for the population aged less than 20 years was 27.6 cases per 100,000 population (6 cases) in the Whangarei district compared with 18.2 cases per 100,000 population under 20 years (8 cases) in the Northland District Health Board (DHB) (Table 1). Three deaths have occurred due to group C meningococcal disease. There were no epidemiological linkages among the cases in Northland, although one Auckland case was related to one of the deaths in Northland.

Table 1. Comparison of group C meningococcal disease rates before the introduction of meningococcal C conjugate vaccine

Location	Year	Meningococcal C disease rate per 100,000 population
United Kingdom[3]	1999	2.0
Australia[4]	2001	3.5
New Zealand	2010	0.5
Northland DHB (total population)	2011[a]	6.1
Northland DHB (population aged <20 years)	2011[a]	18.2

[a] 1 January to 24 October 2011 only

The United States Centers for Disease Control and Prevention and the New Zealand Ministry of Health definition of a community outbreak[2] is "three or more confirmed cases of the same serogroup (and serotype) within a 3-month period and an age-specific incidence or specific community population incidence of approximately 10 cases per 100,000 population, where there is no other obvious link between the cases". The rates in Northland fulfil the criteria for a community outbreak in those individuals who are younger than 20 years. Outbreaks of group C meningococcal disease usually resolve in one-to-three years.[1]

Management of group C meningococcal disease outbreak

From July 2011, Northland DHB's public health strategy for group C meningococcal disease followed a classical approach. This consisted of communication to the public about risks, symptoms and signs and need for early presentation to health services; heightened health professional awareness, including a low threshold for suspected disease and pre-hospital transfer administration of antibiotics; and advice, antibiotic prophylaxis and vaccination (conjugate group C meningococcal vaccine) for close contacts.

As the numbers of cases increased, expert advice was sought from the Immunisation Technical Forum and the Ministry of Health. Following that advice, Northland DHB has implemented a mass vaccination strategy using the conjugate group C meningococcal vaccine, targeting all children and youths from 1 year of age up to 20 years of age. Given the high rate in teenagers, timing in the school year and inadequate security of meningococcal C vaccine supply initially, this began in selected high schools on 27 September 2011, following a 10-day planning period. It has rolled out in primary care from 10 October 2011, and the remaining schools are scheduled in term four.

The conjugate group C meningococcal vaccine is safe and effective. It has been used in the United Kingdom since 1999, and introduced into national immunisation schedules in many European countries, Canada and Australia over the last decade. It is more efficacious in young children than the older polysaccharide vaccines, and disease rates in countries where the vaccine has been introduced have fallen significantly, without evidence of an increase in other strains. In the United Kingdom, a 95% decrease in cases

followed the introduction of the vaccine. In children aged 12 months and older, adolescents and adults, only one dose is needed (0.5 mL, intramuscularly) to protect against the disease.

Mass vaccination can be expected to control the outbreak, reduce morbidity and mortality (group C conjugate vaccines should give at least 3 to 5 years protection in the 1-20 years age group), and reduce public anxiety. A reduction in costs to the health sector and society are likely in the medium- and longer-term. The Northland DHB response has been very timely and there is a capable and willing workforce able to deliver such a programme in an efficient way. However there are multiple challenges. Securing vaccine supply was an initial problem, as there were very limited stocks of the conjugate vaccine available in country. The vaccine programme also poses significant short term costs to the DHB.

Northland has traditionally had low immunisation coverage including in school-based programmes, although the severity of this disease has led to heightened public awareness and demand for the vaccine. Persistent socio-economic and health inequities and Northland's demography (a large proportion of the population living in small rural dispersed communities) provide challenges to achieving equitable access and high coverage. Initial data suggest despite intensive efforts, multiple communication channels and involvement of Māori providers and key stakeholders from the outset, that ethnic disparities in vaccination coverage are present and remain challenging to address. There is also some public confusion about meningococcal groups and an illusion of protection from the previous MeNZB vaccination. Finally, we have set a very ambitious coverage target of 85% in a short time period (to 16 December 2011) in order to achieve outbreak control and provide herd immunity.

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

Reported by Clair Mills, Medical Officer of Health, Northland District Health Board.

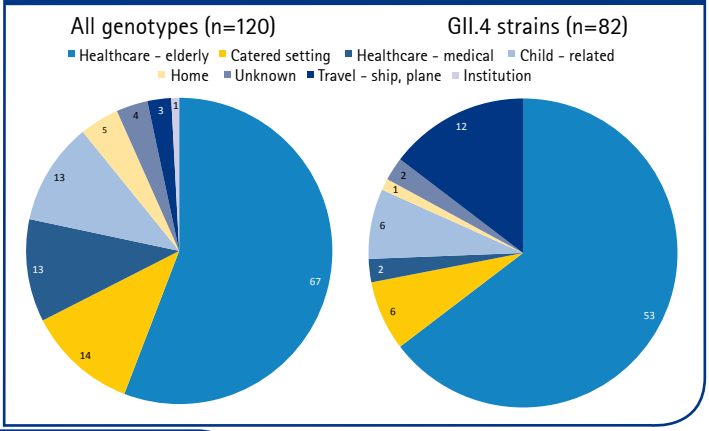
6. Laboratory Surveillance

New Zealand norovirus outbreaks and the emergence of new variant and recombinant strains

The Norovirus Reference Laboratory at ESR carries out laboratory surveillance of norovirus outbreaks for the New Zealand Ministry of Health. This includes identification of norovirus in faecal specimens from gastroenteritis outbreak cases, genotyping of representative outbreak strains and collation of data on the predominant genotypes occurring in New Zealand.

Noroviruses are the leading cause of epidemic acute non-bacterial gastroenteritis worldwide. New Zealand is no exception, with 123 ESR laboratory-confirmed outbreaks reported in 2010 and 120 outbreaks recorded in 2011 up to 30 September. The majority of outbreaks occur in healthcare settings, especially aged-care facilities, where they can generate significant economic impacts on healthcare services. An increasing number of outbreaks are also occurring in settings associated with commercial food operators and child-related activities. In 2011, the pattern of disease is as observed in previous years, with the majority of outbreaks (67/120, 55.8%) occurring in aged-care settings. GII.4 strains have been identified in 82/120 (68.3%) outbreaks (Figure 3).

Figure 3. Norovirus outbreak settings up to 30 September 2011



Over the last 9 years, the predominant norovirus genotype worldwide, including New Zealand, has been GII.4. A number of GII.4 variants have emerged successively to cause widespread outbreaks in cruise ships, institutional and healthcare settings. In New Zealand between 2002 and 2010, there were 882/1322 (66.7%) outbreaks caused by norovirus GII.4 strains. Among these, norovirus GII.4 variants 2002-Farmington Hills, 2004-Hunter, 2006a-Laurens, 2006b-Minerva, 2007-Asia, 2008-Apeldoorn and 2010-New Orleans implicated in overseas outbreaks have circulated in New Zealand, providing evidence of global spread. For a graph showing the successive dominance of the six main GII.4 variants circulating in New Zealand between 2002 and 2010 refer to http://www.surv.esr.cri.nz/surveillance/NZPHSR.php

A number of recombinant norovirus strains have also been identified both in New Zealand and overseas, causing 85 (6.4%) outbreaks between 2002 and 2010. These strains generally have a different genotype in the RNA polymerase region than in the capsid region. Recombination events are believed to occur at the junction of the polymerase gene and the capsid gene to facilitate production of new recombinant strains. The two most common recombinants detected in New Zealand were GIIb-GII.3, responsible for 43 outbreaks, and GIIc-GII.12 which caused 14 outbreaks, seven of which were linked to a local shellfish contamination event in 2008.

The emergence of new GII.4 variants and recombinant strains is likely to occur in a similar manner to antigenic variation in the influenza virus. When a population has developed immunity (which is short lived for norovirus), immune selection pressure together with antigenic variation on the virus capsid, allows escape mutants to bind to antigens on human gut mucosal cells and cause infection. The population has no immunity to these strains, so a new variant or recombinant can emerge and become dominant.[1,2]

The ESR Norovirus Reference Laboratory is a member of the international Noronet network which carries out ongoing global surveillance of norovirus. This surveillance programme enables early identification of new norovirus variants and can inform public health agencies of potential norovirus epidemics. This information can assist in the development of appropriate public health management and control strategies.

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

Reported by Gail Greening, Norovirus Reference Laboratory, 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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