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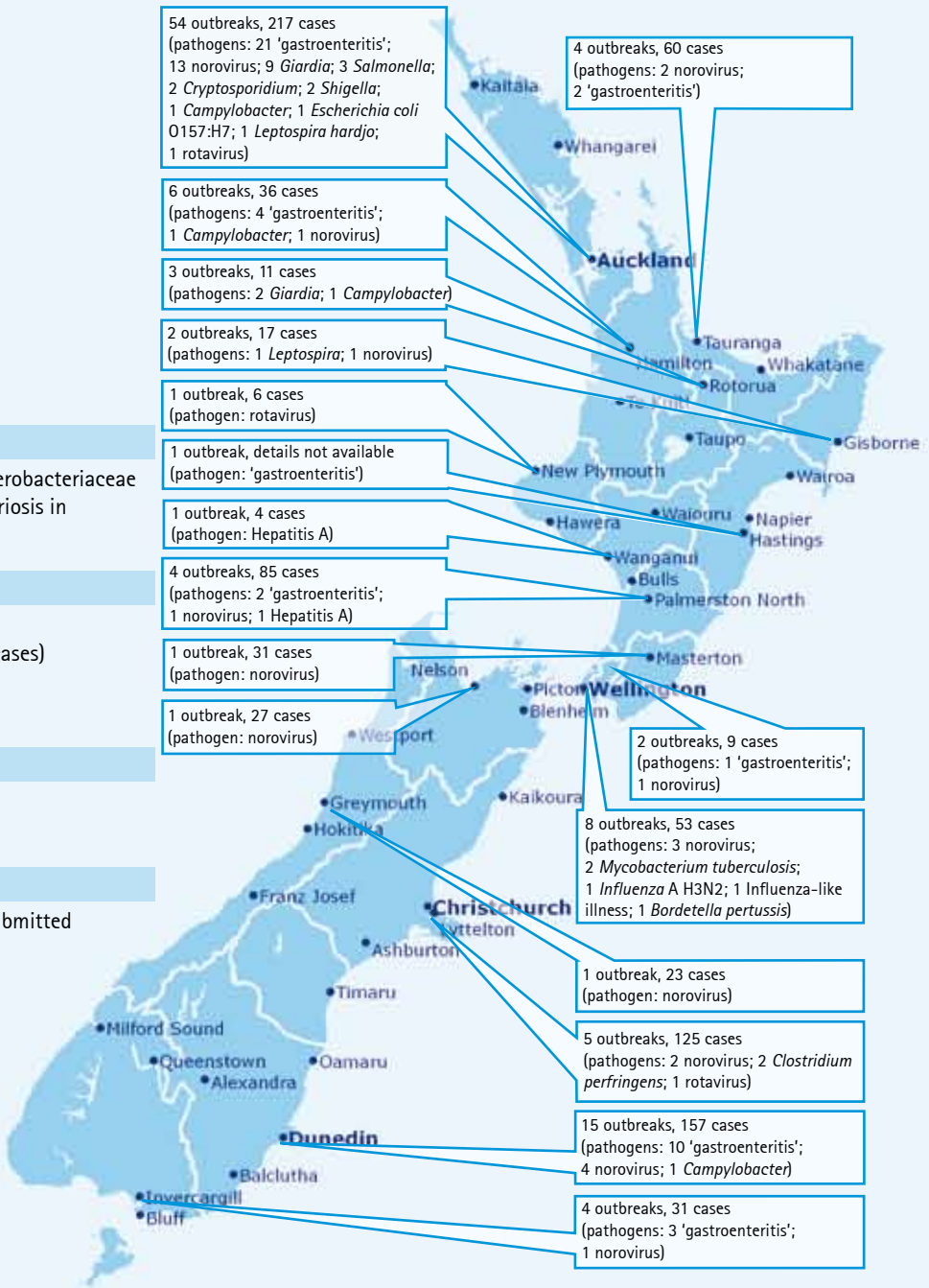
New Zealand Public Health Surveillance Report

December 2008: Covering July – September 2008

Contents & Highlights

This Quarter's Outbreaks

Notification and outbreak data in this issue are drawn from the July – September quarter of 2008. 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 8 October 2008.



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1. Editorial

Pneumococcal Disease: Introduction of the vaccine Prevenar

Worldwide *Streptococcus pneumoniae* infections have been among the leading causes of invasive diseases particularly in young children <5 years of age and in the elderly. These include bacteraemia, meningitis, and pneumonia.[1] On 17 October 2008 Invasive Pneumococcal Disease (IPD) became a notifiable disease under the Health Act 1956. Up until this time, national surveillance of IPD was based on ESR laboratory surveillance. Each year in New Zealand around 500 pneumococcal isolates from invasive disease, are referred to the National Reference Laboratory at ESR for serotyping and antimicrobial susceptibility testing.[2] Analysis of these isolates indicate that IPD occurs predominantly in infants aged <2 years and adults ≥75 years, and is more common in males than females.[2] No ethnicity or other demographic risk factors for IPD could be obtained from these isolates as this information was usually not reported with the referred isolates. However, in an earlier Auckland-based study, the incidence of IPD among Pacific Island children was nearly four times, and that among Māori over twice, the rate in other ethnic groups.[3]

The pneumococcus is an asymptomatic coloniser of the human nasopharynx or upper respiratory tract. Pneumococci express a surface coat composed of polysaccharides which are long-linked sugar molecules. These capsular polysaccharides are antigenic virulence factors against which protective serotype-specific IgG antibodies are developed.[4] Over 90 serotypes have been described internationally. Serotype variants are defined by a letter after the serotype, for example, 19F. The serotypes most commonly found in New Zealand are relatively stable. Over the eight-year period, 1998-2005, the most common types causing IPD were 4, 6B, 9V, 14, 18C, 19F, and 23F [2] - a range consistent with that reported in the United States for 2007.[5] These seven types accounted for 80.9% of IPD cases in New Zealand infants <2 years of age during the 1998-2005 period.[2] In a previous New Zealand study for the period 1987-1994 a similar pattern of strain types [1, 4, 6B, 7, 9V, 14, and 19F] was most common.[6] The more recent analysis shows types 1 and 7 being replaced over the last eight years by types 18C and 23F.[2]

Until recently, the only vaccine available for protection against pneumococcal disease was Pneumovax®, a 23-valent polysaccharide vaccine (PPV23) first licensed in 1989 and recommended for use in adults particularly over 65 years of age. Although antigenically representative for the common capsular serotypes responsible for pneumococcal infections, Pneumovax fails to protect children under the age of two years.[7] Furthermore, immunity produced by Pneumovax has been shown to be short lived as the vaccine does not induce a T-cell-dependent immune response.[1]

As early as 1929 Avery et al. (reported by Bogaert et al.)[7] showed that covalent binding of capsular polysaccharides to a protein carrier increased the immunogenicity of the polysaccharides. The conjugation of the pneumococcal capsular polysaccharides to a protein carrier enables induction of memory B cells and improved B cell responses.[7,8] Such protein adjuvants have been variously used as carriers for other vaccines, including *Haemophilus influenzae* type b vaccine. Adjuvants used include tetanus toxoid, diphtheria toxoid [CRM] and outer membrane proteins from group B meningococci. However, it was not until 2000 that the first polysaccharide-protein conjugated pneumococcal vaccine, Prevenar®, was licensed and marketed in the USA. Prevenar is a 7-valent vaccine (PCV7), and contains polysaccharide of serotypes 4, 6B, 9V, 14, 18C, 19F and 23F. Following the introduction of PCV7 into the immunisation programme in the United States, there was a 69% reduction in the incidence of IPD in children <1 year of age, a 68% reduction in those aged 1-2 years, and a 44% reduction in those aged 2-3 years. No reduction was seen in children 3-4 years of age.[8] PCV7 also has been shown to be effective against pneumococcal pneumonia.[9]

Prevenar was introduced into the New Zealand immunisation schedule in June 2008 for all infants born from 1 January 2008. However, it was available for high-risk infants from 2006. The New Zealand Prevenar immunisation schedule comprises doses given at 6 weeks, 3 months and 5 months of age, with a booster dose at age 15 months.

ESR is continuing to monitor the source and capsular types of all invasive disease isolates referred from cases of IPD. Overseas serotype 19A in particular has been singled out as a replacement for 19F.[9] However, it is unclear if this is a natural trend or represents immune pressure selection following introduction of the Prevenar vaccine. Prior to vaccine introduction 19A was already one of the commoner causes of IPD in New Zealand.[2] Multilocus sequence typing is also being set up to determine clonal variation in strains and the monitoring of antimicrobial resistance will be ongoing.

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

Diana Martin, Communicable Disease Programme, ESR

2. Notifiable Disease Surveillance

The following is a summary of disease notifications for the July – September quarter of 2008 and cumulative notifications and rates calculated for a 12-month period (October 2007 – September 2008). 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, R. G. and D. G. Altman. Proportions and their differences. In: Statistics with Confidence. 2000. BMJ Books. Bristol]. Data contained within this report are based on information recorded in EpiSurv by public health service staff up to 8 October 2008. As this information may be updated over time, these data should be regarded as provisional.

National surveillance data tables are available online (www.surv.esr.cri.nz).

VACCINE PREVENTABLE DISEASE

Measles

- *Notifications:* 1 notification in the quarter (2007, 4); 18 notifications over the last 12 months (2007, 20) giving a rate of 0.4 cases per 100,000 population (2007, 0.5); not a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (8 cases); the case was not laboratory confirmed and was vaccinated in Holland

Pertussis

- *Notifications:* 112 notifications in the quarter (2007, 82); 322 notifications over the last 12 months (2007, 418) giving a rate of 7.6 cases per 100,000 population (2007, 9.9); a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (70 cases) and from the same quarter last year (82 cases)

INFECTIOUS RESPIRATORY DISEASES

Acute Rheumatic Fever

- *Notifications:* 58 notifications in the quarter (2007, 97); 230 notifications over the last 12 months (2007, 147) giving a rate of 5.4 cases per 100,000 population (2007, 3.5); a statistically significant increase
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (97 cases). Cases were distributed by age as follows: 1 (less than 1 year), 13 (5-9 years), 25 (10-14 years), 8 (15-19 years), and 11 (greater than 20 years); 54 cases were initial attacks of acute rheumatic fever and 4 cases were recurrent attacks

Meningococcal Disease

- *Notifications:* 48 notifications in the quarter (2007, 42); 120 notifications over the last 12 months (2007, 119) giving a rate of 2.8 cases per 100,000 population (2007, 2.8); no change

- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (26 cases) reflecting the expected seasonal peak of cases in winter/spring. Cases were distributed by age as follows: 6 (less than 1 year), 14 (1-4 years), 2 (5-9 years), 6 (10-14 years), 6 (15-19 years), and 14 (greater than 20 years); 16 cases were the epidemic strain

ENTERIC INFECTIONS

Campylobacteriosis

- *Notifications:* 1,532 notifications in the quarter (2007, 2,659); 7,401 notifications over the last 12 months (2007, 14,120) giving a rate of 175.0 cases per 100,000 population (2007, 333.9); a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (1,053 cases) and a statistically significant quarterly decrease from the same quarter last year (2,659 cases)

Listeriosis

- *Notifications:* 10 notifications in the quarter (2007, 5); 30 notifications over the last 12 months (2007, 24) giving a rate of 0.7 cases per 100,000 population (2007, 0.6); not a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (2 cases). One case was aged less than 1 year

Salmonellosis

- *Notifications:* 234 notifications in the quarter (2007, 234); 1,363 notifications over the last 12 months (2007, 1,230) giving a rate of 32.2 cases per 100,000 population (2007, 29.1); a statistically significant increase
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (287 cases)

Typhoid

- *Notifications:* 10 notifications in the quarter (2007, 9); 30 notifications over the last 12 months (2007, 64) giving a rate of 0.7 cases per 100,000 population (2007, 1.5); a statistically significant decrease

VTEC Infections

- *Notifications:* 22 notifications in the quarter (2007, 23); 128 notifications over the last 12 months (2007, 92) giving a rate of 3.0 cases per 100,000 population (2007, 2.2); a statistically significant increase

ENVIRONMENTAL EXPOSURES & INFECTIONS

Chemical Poisoning

- *Notifications:* 0 notifications in the quarter (2007, 8); 0 notifications over the last 12 months (2007, 37) giving a rate of 0.0 cases per 100,000 population (2007, 0.9); a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (8 cases)

Cryptosporidiosis

- *Notifications:* 275 notifications in the quarter (2007, 224); 723 notifications over the last 12 months (2007, 977) giving a rate of 17.1 cases per 100,000 population (2007, 23.1); a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (93 cases) and from the same quarter last year (224 cases)

Giardiasis

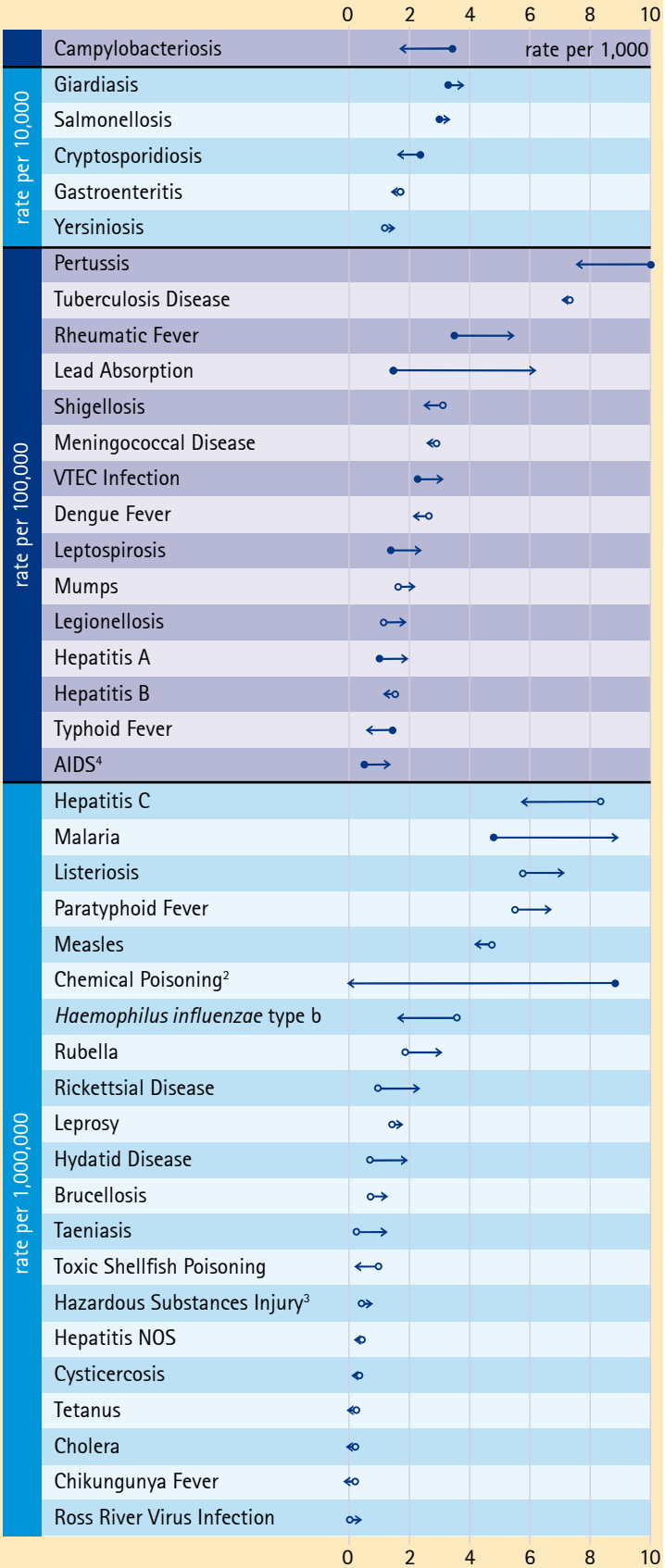
- *Notifications:* 429 notifications in the quarter (2007, 319); 1,594 notifications over the last 12 months (2007, 1,363) giving a rate of 37.7 cases per 100,000 population (2007, 32.2); a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (319 cases)

Hepatitis A

- *Notifications:* 39 notifications in the quarter (2007, 6); 83 notifications over the last 12 months (2007, 43) giving a rate of 2.0 cases per 100,000 population (2007, 1.0); a statistically significant increase

National Surveillance Data

12-Monthly Notification Rate Changes[1]



Notifications per 1,000 or 10,000 or 100,000 or 1,000,000 persons

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 2007 – September 2008 and compared to previous 12-month rates

[2] From the environment

[3] Hazardous Substance Injury became notifiable in EpiSurv as of 19 September 2007

[4] 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

- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (15 cases) and from the same quarter last year (6 cases). Notified cases were aged between 3 months and 78 years, with 17 cases under the age of 16 years

Lead Absorption

- *Note:* since June 2007 the blood lead level for reporting has lowered from 0.72 to 0.48 µmol/l
- *Notifications:* 100 notifications in the quarter (2007, 11); 260 notifications over the last 12 months (2007, 61) giving a rate of 6.1 cases per 100,000 population (2007, 1.4); a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (70 cases) and from the same quarter last year (11 cases). Cases were distributed by age as follows: 1 (less than 1 year), 1 (1-4 years), 22 (15-24 years), 32 (25-44 years), 42 (45-64 years), 1 (65 years and over), and 1 of unknown age; 90 male cases, 8 female cases, and 2 of unknown sex; 73 cases recorded an occupation that involved exposure to lead: painter (14), cleaner (4), works with metal (3), supervisor (3), makes stained glass windows (2), labourer (2), and a boat builder, radiator repairer and sand blaster (1 case each), and 42 cases were not specified

Legionellosis

- *Notifications:* 23 notifications in the quarter (2006, 7); 77 notifications over the last 12 months (2006, 57) giving a rate of 1.8 cases per 100,000 population (2006, 1.3); not a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (7 cases)

Leptospirosis

- *Notifications:* 34 notifications in the quarter (2007, 6); 98 notifications over the last 12 months (2007, 67) giving a rate of 2.3 cases per 100,000 population (2007, 1.6); a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (6 cases). There were 28 male cases, 6 female cases; 5 meat process/freezing workers, 4 farmers (including dairy farmer) and 1 geologist. The remaining cases either did not have an occupation stated or did not participate in a high risk occupation for leptospirosis exposure

NEW, EXOTIC & IMPORTED INFECTIONS

Dengue Fever

- *Notifications:* 31 notifications in the quarter (2007, 6); 95 notifications over the last 12 months (2007, 109) giving a rate of 2.2 cases per 100,000 population (2007, 2.6); not a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (6 cases); 29 notifications were laboratory confirmed; all cases had an overseas travel history during the incubation period and the places visited were Samoa (15), Fiji (4), Tonga (3), Indonesia (2), Thailand (2), Bangladesh (1), Cook Islands (1), India (1), Malaysia (1), Philippines (1), Singapore (1), Vanuatu (1), Vietnam (1), and Central Asia (1)

Malaria

- *Notifications:* 9 notifications in the quarter (2005, 6); 38 notifications over the last 12 months (2005, 20) giving a rate of 0.9 cases per 100,000 population (2005, 0.5); a statistically significant increase
- *Comments:* 6 cases had malaria parasites in a blood film; 7 cases were overseas during the incubation period, the travel history of 1 case was unknown and 1 case had a prior history of overseas travel that could account for the infection

Rickettsial Disease

- *Notifications:* 9 notifications in the quarter (2007, 1); 10 notifications over the last 12 months (2007, 4) giving a rate of 0.2 cases per 100,000 population (2007, 0.1); not a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (1 case) and from the previous quarter (1 case); 6 cases were classified as murine typhus and 3 cases were not further specified

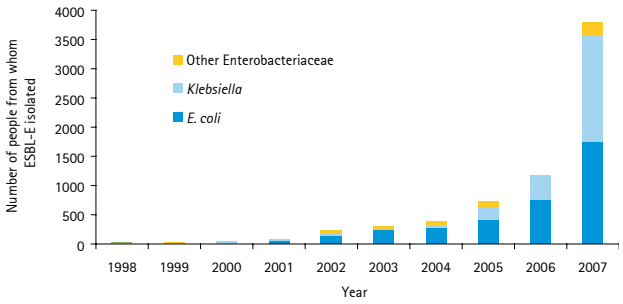
3. Other Surveillance Reports

Extended-spectrum β-lactamase (ESBL)-producing Enterobacteriaceae

Extended-spectrum β-lactamases (ESBLs) confer resistance to third- and fourth-generation cephalosporins and monobactams, in addition to the earlier generation cephalosporins. ESBLs are most common in *Klebsiella pneumoniae* and *Escherichia coli*, but do occur in other Enterobacteriaceae. ESBLs are being increasingly identified in many parts of the world and are now very prevalent in several countries in the Asia-Pacific region.

The national surveillance of ESBL-producing Enterobacteriaceae (ESBL-E) is now based on annual one-month surveys. The 2007 survey was conducted in August 2007. Hospital and community microbiology laboratories throughout New Zealand were asked to refer all ESBL-E isolated during August to ESR. During the month, 317 non-duplicate ESBL-E isolates were referred. This number of referrals equates to an annualised incidence rate of 90 ESBL-E per 100,000 population and a marked increase compared with earlier years. Information on whether the ESBL-E was causing infection or colonising was received for 259 (82%) of the isolates, of which 131 (51%) were categorised as from infections.

Figure 1. ESBL-producing Enterobacteriaceae, 1998-2007

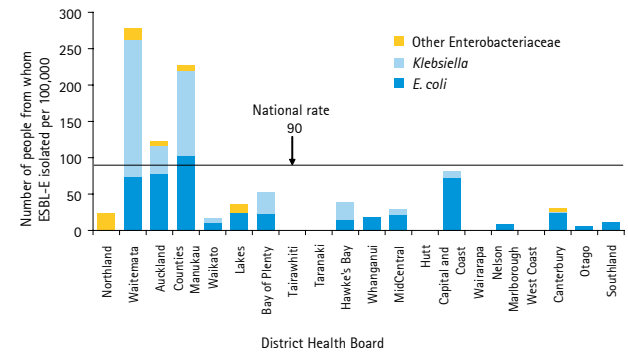


Data for 1998 to 2005 are based on continuous surveillance of all ESBL-E isolations. Data for 2006 and 2007 are annualised and based, respectively, on 4-week and 1-month surveys conducted in these years. The 2006 survey only included urinary *E. coli* and *Klebsiella*, therefore the data for 2006 is not directly comparable with that for other years.

The 317 ESBL-E isolates referred in 2007 comprised 153 (48%) *Klebsiella* species, 146 (46%) *E. coli*, 11 (4%) *Enterobacter cloacae*, 6 (2%) *Citrobacter* species, and 1 (0.3%) *Morganella morganii*. *Klebsiella* formed a much greater proportion of the ESBL-producing isolates in 2007 than in previous years (Figure 1).

The patients from whom ESBL-E were isolated were categorised as hospital patients if they were in a healthcare facility (including emergency department, outpatient clinic or residential-care facility) when ESBL-E was isolated or had been in a healthcare facility in the previous 3 months. All other patients were categorised as community patients. The majority of the ESBL-E (79%), and notably 92% of ESBL-producing *Klebsiella*, were isolated from patients categorised as hospital patients.

Figure 2. Annualised incidence of ESBL-producing Enterobacteriaceae by DHB, 2007



Data for the Canterbury and South Canterbury DHBs are combined. The rates will be influenced to some extent by differences in the amount of screening being undertaken in different hospitals.

Figure 2 shows the incidence of ESBL-E in each district health board (DHB) area. The highest annualised incidence rates, and rates above the national rate of 90 per 100,000, occurred in the Waitemata (278 per 100,000), Counties Manukau (227) and Auckland (122) DHBs.

Identification of the ESBL types among ESBL-producing *E. coli* and *Klebsiella* in the 2006 survey showed almost all (96%) were CTX-M types, especially CTX-M-15 (75%). In the 2007 survey, the ESBL types were only identified in organisms other than *E. coli* and *Klebsiella*. SHV-12 and CTX-M-9 were the dominant ESBL types in these other organisms (ie, *E. cloacae, Citrobacter* and *M. morganii*).

ESBL-E are frequently resistant to several classes of antibiotics in addition to cephalosporins. The ESBL-E included in this survey were commonly resistant to ciprofloxacin, gentamicin/tobramycin, and co-trimoxazole/trimethoprim, but susceptible to carbapenems and amikacin. The most common pattern of multiresistance among ESBL-producing *E. coli* was ciprofloxacin, gentamicin/tobramycin and co-trimoxazole/trimethoprim resistance. Two multiresistant patterns were common among ESBL-producing *Klebsiella*: (1) gentamicin/tobramycin, co-trimoxazole/trimethoprim and nitrofurantoin resistance; and (2) ciprofloxacin, gentamicin/tobramycin, co-trimoxazole/trimethoprim and nitrofurantoin resistance.

A more detailed report is available at:
www.surv.esr.cri.nz/PDF_surveillance/Antimicrobial/ESBL_2007.pdf

Reported by Helen Heffernan, Communicable Disease Programme, ESR

Analysis of the lower notification rate of campylobacteriosis in MidCentral, 1999 - 2003

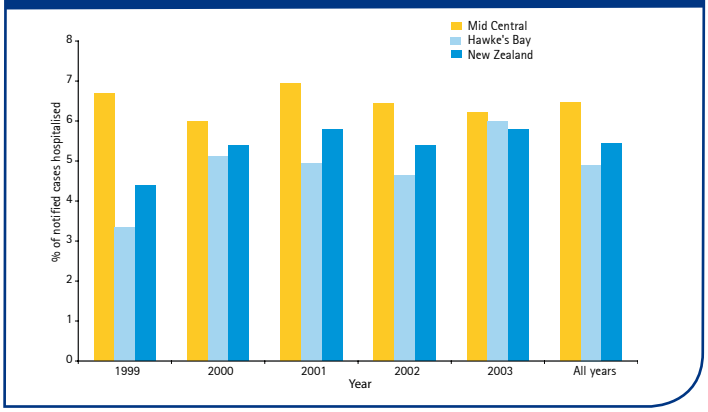
In past years, the incidence of campylobacteriosis in New Zealand has exceeded that of many other western nations.[1] When compared to the rest of the country and to other District Health Boards (DHBs), the notification rate of campylobacteriosis in the MidCentral region is comparatively low.[2] Between 1999 and 2003, the age-standardised notification rate of campylobacteriosis in MidCentral was 40% less than that of the national rate.[3]

The aim of this analysis was to investigate whether the lower notification rate of camplyobacteriosis in the MidCentral DHB during 1999 to 2003 was due to a true lower disease incidence in this region. The rate of hospitalisation due to campylobacteriosis, and the prevalence of risk factors for Campylobacter infection, was compared between MidCentral and a 'control' DHB, Hawke's Bay. The latter region has a similar population count and age structure to MidCentral, has common industries, and is located within a similar geographical region. However, despite these similarities, the MidCentral DHB region has an age-standardised rate of campylobacteriosis notifications that is less than 60% of that recorded in Hawke's Bay.[3]

Hospitalisation data

The proportion of notified camplyobacteriosis cases that were hospitalised in MidCentral DHB, Hawke's Bay DHB and New Zealand is shown in Figure 3. The results demonstrate that a relatively greater proportion of campylobacteriosis cases are hospitalised in the MidCentral region, than compared to Hawke's Bay DHB and all of New Zealand.

Figure 3. Proportion of notified campylobacteriosis cases hospitalised for New Zealand, MidCentral DHB, and Hawke's Bay DHB, 1999 – 2003.



Assuming the threshold for admission due to campylobacteriosis was the same within these three regions, and that the patients of these populations suffered the same approximate severity of illness, there are two possible explanations for these findings: (i) the numerator was over-estimated, so that there were fewer actual hospitalisations due to campylobacteriosis than the amount recorded; or (ii) the denominator was under-estimated, such that there were more campylobacteriosis cases in the region than those being notified.

The first explanation is unlikely as laboratory diagnosis is needed to code a hospital visit as being due to campylobacteriosis. It is more plausible that campylobacteriosis hospitalisations are incorrectly coded as another illness due to lack of testing, than it is for them to be erroneously coded as campylobacteriosis. The second explanation is more likely, which involves a higher number of base-line campylobacteriosis cases than those actually being notified. This hypothesis is supported by the international literature estimating that the true incidence of campylobacteriosis in a community may be anywhere between 7 and 38 times more than the notification rate.[4-6] Baker et al. agree that the correlation of notifications with hospitalisation data suggests 'surveillance artefact' as the explanation for regional differences in notification rates.[7] That is, some regions may have greater degrees of under-ascertainment of notification data as opposed to true marked variations in infection incidence.

Risk factor review

The impact of known risk factors for campylobacteriosis in the MidCentral and Hawke's Bay DHB regions were also compared to investigate whether the lower notification rate in MidCentral was due to a true lower incidence in camplyobacteriosis. The following evidence-based exposures were investigated (proxy indicators in brackets):

- Age (standardised rates)
- Sex (male: female ratio)
- Ethnicity (% of:the population non- Maori non-Pacific)
- Climate (mean tempreture,mean rainfall)
- Rurality (population density)
- Contaminated water (% population on registered water supply)
- Contaminated milk (number of dairy cattle)
- Contaminated animals (ruminant density,poultry density)

A detailed review of these factors revealed few significant regional differences that would contribute to the comparatively low rate of campylobacteriosis reported in the MidCentral region. That is, there was little evidence that a reduced exposure to these risk factors account for the lower notification rate of campylobacteriosis in MidCentral.

In conclusion, this analysis did not demonstrate that the disparities in the camplyobacteriosis notification rates between the MidCentral and Hawke's Bay DHB regions were due to a true lower incidence of infection in MidCentral. Other possible explanations for the lower notification rate in MidCentral during the study period could include differences in the investigation of acute gastrointestinal illness by general practitioners, the laboratory testing methods used, or the reporting of notifiable diseases by medical practitioners.

Further information on the full analysis can be obtained by contacting the author (email: juliet.rumball-smith@otago.ac.nz).

References

1. Baker M, Wilson N, Ikram R, et al. 2006. Regulation of chicken contamination urgently needed to control New Zealand's serious campylobacteriosis epidemic. New Zealand Medical Journal 119 (1243).
2. Institute of Environmental Science and Research Limited 2008. Notifiable and other diseases in New Zealand: Annual report 2007. Institute of Environmental Science and Research Limited, Wellington.
3. Public Health Intelligence 2007. Data analysis performed by request. Public Health Intelligence, Wellington.
4. Wheeler JG, Sethi D, Cowden J, et al 1999. Study of infectious intestinal disease in England: Rates in the community, presenting to general practice, and reported to national surveillance. British Medical Journal 318: 1046 - 50.
5. Mead P, Slutsker L, Dietz V, et al 1999. Food-related illnesses and death in the United States. Emerging Infectious Diseases 15: 607 - 25.
6. The OzFoodNet Working Group 2006. Burden and causes of foodborne disease in Australia: Annual report of the OzFoodNet network, 2005. Communicable Disease Intelligence 30: 278 - 300.
7. Baker M, Sneyd E, Wilson N 2007. Is the major increase in notified campylobacteriosis in New Zealand real? Epidemiology and Infection 135: 163 - 70

Reported by Juliet Rumball-Smith,Public Health Medecine Trainee, MidCentral Public Health Unit

4. Outbreak Surveillance

The following information is a summary of the outbreak trends for New Zealand, from data collected in the last quarter (July – September 2008). Comparisons are made to the previous quarter (April – June 2008), and to the same quarter in the previous year (July – September 2007). Note that the outbreak data in this section are notified to ESR by the Public Health Services.

General

- 113 outbreaks notified in this quarter (892 cases)
- 77 are 'final' reports (775 cases); 36 are 'interim' reports (117 cases) that have yet to be finalised and closed

All following data pertain to final reports only.

- 10.1 cases on average per outbreak, compared with 11.6 cases per outbreak in the previous quarter (11.8 cases per outbreak in the same quarter of last year)
- 8 hospitalisations: *Leptospira hardjo* (2), *Mycobacterium tuberculosis* (2), norovirus (2), *Influenza* A H3N2 (1) and Influenza-like illness (1)
- 1 death: *Mycobacterium tuberculosis*

Pathogens

- 30 norovirus outbreaks (490 cases) during this quarter
- 21 'gastroenteritis' outbreaks (139 cases)
- 8 *Giardia* outbreaks (24 cases)
- 3 rotavirus outbreaks (32 cases)
- 3 *Campylobacter* outbreaks (8 cases)
- 2 *Clostridium perfringens* outbreaks (24 cases)
- 2 *Mycobacterium tuberculosis* outbreaks (5 cases)
- 1 *Influenza* A H3N2 outbreak (26 cases)
- 1 Influenza-like illness outbreak (9 cases)
- 1 *Cryptosporidium* outbreak (4 cases)
- 1 Hepatitis A outbreak (4 cases)
- 1 *Escherichia coli* O157:H7 outbreak (3 cases)
- 1 *Salmonella* outbreak (3 cases)
- 1 *Leptospira hardjo* outbreak (2 cases)
- 1 *Shigella sonnei* outbreak (2 cases)

Modes of Transmission

Note that reporting allows for multiple modes of transmission to be selected. In many instances no mode of transmission is selected for outbreaks notified to ESR, consequently, numbers may not add up to the total number of outbreaks reported.

- 46 person-to-person, from (non-sexual) contact with an infected person (including droplets): 17 norovirus (332 cases), 9 gastroenteritis (92 cases), 7 *Giardia* (22 cases), 3 rotavirus (32 cases), 2 *M. tuberculosis* (5 cases), 1 *Influenza* A H3N2 (26 cases), 1 *C. perfringens* (16 cases), 1 Influenza-like illness (9 cases), 1 *Cryptosporidium* (4 cases), 1 Hepatitis A (4 cases), 1 *E. coli* O157:H7 (3 cases), 1 *Salmonella* (3 cases) and 1 *S. sonnei* (2 cases)
- 25 foodborne, from consumption of contaminated food or drink (excluding water): 10 norovirus (119 cases), 10 gastroenteritis (41 cases), 3 *Campylobacter* (8 cases) and 2 *C. perfringens* (24 cases)
- 14 environmental, from contact with an environmental source (e.g. swimming): 7 norovirus (29 cases), 3 gastroenteritis (56 cases), 3 rotavirus (32 cases) and 1 *C. perfringens* (16 cases)
- 3 waterborne, from consumption of contaminated drinking water: 3 *Giardia* (10 cases)
- 3 zoonotic, 1 *Giardia* (5 cases), 1 *E. coli* O157:H7 and 1 *L. hardjo* (2 cases)
- 2 'other' mode of transmission: 1 *Influenza* A H3N2 (via fomites) (26 cases) and 1 norovirus (4 cases)
- 12 'unknown' mode of transmission: 6 gastroenteritis (28 cases), 5 norovirus (45 cases) and 1 *Giardia* (2 cases)

Circumstances of Exposure/Transmission

Common 'settings' where exposure/transmission occurred or contaminated food/beverage was prepared for consumption are identified below. Note that multiple settings can be selected and in many instances no settings are selected in outbreaks notified to ESR.

- 21 home: 6 *Giardia* (20 cases), 5 norovirus (23 cases), 4 gastroenteritis (22 cases), 2 *M. tuberculosis* (5 cases), 1 *Cryptosporidiosis* (4 cases), 1 Hepatitis A (4 cases), 1 *Salmonella* (3 cases) and 1 *S. sonnei* (2 cases)
- 14 rest home: 6 norovirus (164 cases), 5 gastroenteritis (71 cases), 1 *Influenza* A H3N2 (26 cases), 1 Influenza-like illness (9 cases) and 1 *Campylobacter* (4 cases)
- 13 café: 5 norovirus (12 cases), 5 gastroenteritis (13 cases), 2 *C. perfringens* (24 cases) and 1 *Giardia* (2 cases)
- 9 childcare: 4 norovirus (89 cases), 3 rotavirus (32 cases) and 2 gastroenteritis (12 cases)
- 6 hospital (continuing care): 3 norovirus (106 cases), 1 Influenza-like illness (9 cases), 1 *Campylobacter* (4 cases) and 1 gastroenteritis (3 cases)
- 5 'other' food outlet: 3 gastroenteritis (7 cases) and 2 norovirus (14 cases)
- 4 hospital (acute care): 4 norovirus (88 cases)
- 4 farm: 1 *Giardia* (5 cases), 1 E. coli O157:H7 (3 cases), 1 *Campylobacter* (2 cases) and 1 *L. hardjo* (2 cases)
- 4 takeaways: 3 gastroenteritis (16 cases) and 1 norovirus (2 cases)
- 2 workplace: 2 norovirus (37 cases)
- 1 caterers: *Campylobacter* (4 cases)
- 1 school: Hepatitis A (4 cases)
- 1 hotel/motel: *Giardia* (2 cases)
- 1 prison: *Campylobacter* (2 cases)
- 8 'other setting': 5 norovirus (99 cases), 1 gastroenteritis (16 cases), 1 rotavirus (6 cases) and 1 *Campylobacter* (2 cases)
- 3 outbreaks with no setting selected: 2 norovirus (4 cases) and 1 *Giardia* (2 cases)

5. Outbreak Case Reports

An outbreak of leptospirosis on a dairy farm

On 14 July 2008, a farm worker presented to hospital with a history of muscle aches, loss of appetite, sensitivity to light and neck stiffness. His illness rapidly increased in severity, with the patient experiencing high fever, chills and left-sided chest pain. Liver function tests were mildly deranged. Treatment with antibiotics to cover meningitis and leptospirosis was commenced. *Leptospira* DNA was detected in urine via DNA amplification by PCR and serology on 24 July 2008 was positive for *L. ballum, L. hardjo* and *L. tarassovi. Leptospira ballum* is found in rats, *L. hardjo* in cattle and *L. tarassovi* in pigs. The patient's job as a farm worker predominantly involved milking cows without the use of protective clothing. He had also kept pigs approximately two years ago.

On 20 July 2008 a second dairy farm worker from the same farm presented to hospital with fever, diarrhoea, vomiting and muscle aches and was discharged the following morning having improved with IV fluids and antiemetics. He was readmitted to hospital on 25 July following rapid deterioration at home involving high fevers, chills, further diarrhoea and vomiting. Upon admission it was established that the first farm worker presenting on 14 July and this second farm worker were employed on the same farm. Testing demonstrated markedly elevated liver function tests. Although *Leptospira* DNA was not detected in urine by PCR, a probable diagnosis of leptospirosis was suspected and treatment with penicillin and doxycycline was implemented. Serology on 8 August was positive for *L. hardjo*. No other serovars were isolated.

Repeat sampling for re-testing for all leptospiral serotypes should be conducted two weeks post first sampling. Significant cross reactivity boosting can occur, complicating the identification of an animal source

where multiple serovars are isolated. A third sample will often reflect a rise in one particular serovar to assist in this identification. In this outbreak *L. hardjo* was the implicated pathogen.

The supervisor on the farm where the outbreak occurred stated that the herd had been immunised. Veterinary analysis of blood samples taken from a random selection of cows revealed one cow with a high level of *Leptospira*. Consequently, the herd was treated with antibiotics, revaccinated, and is to be monitored and audited by a veterinary service. The farm is part of the Leptosure programme, whereby in consultation with their veterinarian, farmers registered with Leptosure decide how best to implement a risk management programme on their dairy farm. The farm is assigned a Protected Leptosure status once the risk management programme has been implemented. The status is recorded on the Livestock Improvement national database and is reassessed on an annual basis to ensure ongoing compliance with the programme.

The Department of Labour was contacted and the farm workers received education on protective measures and clothing. There had also been a problem with a rat infestation on the farm and anti-rodent measures were implemented with involvement of the territorial authority.

Leptospirosis is a disease caused by a bacterium, known as a leptospire, found in many animals including cattle, deer, pigs, sheep, possums and rats. It is excreted in the urine of animals and infects humans by entering through cuts and cracks in the skin or through mucus membranes of the eyes, nose and mouth. People normally become infected directly by the urine, or from water contaminated by animal urine. Leptospirosis is the most commonly occupationally acquired infectious disease in New Zealand, and one of the most common zoonoses. The incubation period following infection is approximately 4-19 days before the manifestation of fever, headache, chills, muscle ache, eye inflammation, hepatitis, and less frequently meningitis or impairment of renal function.

The disease is prevented through good sanitation. Rodent control and the prevention of contamination with the urine of infected animals, also help minimize the risk of spreading the disease. Elimination of sources of food and harbourage attractive to rodents is essential. Waterproof, gauntlet style gloves and gumboots should be worn when working in potentially contaminated water or soil. Workers should shower thoroughly after working in a potentially contaminated area and thoroughly wash hands and arms in soapy water after handling animals or rat traps. Hand to mouth, nose and eye contact should be avoided while handling animals that may be infected. To control leptospirosis, herds should be vaccinated using an annual, two dose treatment. It is recommended that people wear suitable protective clothing when working with cattle.

Reported by Janine Manuel, Public Health Scientist, John Whitmore, Health Protection Officer and Simon Baker, Medical Officer of Health, Auckland Regional Public Health Service

Occupational lead poisonings in the Auckland region

The number of lead poisoning notifications to Auckland Regional Public Health Service (ARPHS) has increased dramatically in 2008 from an average of 10-20 per annum between 2001 and 2007 to 140 in 2008 between January and September. The reason for this increase is threefold. The first change occurred from September 2007 when the non-occupational blood lead notification level in Schedule 2, Section B of the Health Act 1956 was dropped from 0.72 to 0.48 umol/L. The next change occurred in December 2007 when direct laboratory notification of conditions notifiable under the Health Act came into effect. Previously, lead level notification relied on action by the attending clinician. The third change came in May 2008 when the Ministry of Health amended previous advice, and advised that occupational lead levels were notifiable to medical officers of health. Schedule 2, Section A of the Health Act states that occupational blood lead levels equal to or above 0.72 umol/L (15 ug/dl) are notifiable. As a result of the Ministry of Health's advice, ARPHS subsequently began entering occupational lead notifications into EpiSurv and cases were followed up by ARPHS staff and referred to the Department of Labour as appropriate.

This has increased ARPHS awareness of occupational lead poisonings and in recent months we became aware of the harbour bridge paint-stripping operation. Most of the bridge was painted in the 1950s when paint contained lead, while paint obtainable from the 1980s onwards was free of lead. Operations commenced this year in order to strengthen the clip-on lanes by inserting bare metal to metal reinforcements, requiring approximately 50 men over the next three years. As a result of these operations, some interesting blood lead level information has emerged.

ARPHS noticed that some men were showing marked increases in blood lead level within about a month of beginning work as part of the paint stripping gang, with levels often rising from <1umol/L to >2umol/L, the highest level being 4.1umol/L. A fruitful relationship was subsequently established with the health and safety officer looking after operations. Their investigations were able to determine the reason for these precipitous rises in blood lead levels. Crew involved in the dry paint-stripping process wore full face respirators and generally showed little rise in lead levels, while clean-up crew involved in sweeping up the contaminated paint dust showed significant increases. Investigation revealed that this was due to the discomfort experienced by the men wearing full face masks who tended to remove them and replace them with less effective dust masks. In addition, crew were tending to wear their masks *over* their hooded overalls so that masks were being removed prior to contaminated clothing, allowing inhalation of contaminated dust during the process of removing dusty overalls.

Mitigation of these problems by the health and safety officer has been very effective. Measures have included: (i) on-the-job education; (ii) regular checks that protective gear is being worn; (iii) institution of a three-stage decontamination procedure that involves overalls and contaminated gear being appropriately disposed prior to mask removal; and (iv) regular 2-4 weekly blood lead checks. Crew showing levels of 1.5 umol/L and above are removed from paint-stripping operations until blood lead levels have normalised. ARPHS also regularly passes on information from laboratory notified lead levels to the health and safety officer for their attention and appropriate action. Since these measures were introduced no further increases in blood lead levels have been observed.

Reported by Denise Barnfather, Medical Officer of Health, Auckland Regional Public Health Service

6. Pathogen Surveillance

Unless otherwise reported, pathogen surveillance covers the July – September 2008 quarter.

ENTERIC PATHOGENS

The Enteric Reference Laboratory (ERL) is responsible for the confirmation of the following notifiable diseases *Salmonellae, Shigellae, Vibrio cholerae* O1 and VTEC.

Salmonella (ERL)

Human and non-human *Salmonella* isolate data are available at www.surv.esr.cri.nz/enteric_reference/enteric_reference.php

- 273 human and 620 non-human isolates were submitted to ERL (2007, 250 and 387 respectively)
- no outbreaks were reported
- the increase in non-human isolates is attributable to sick cattle mainly in the Waikato area, the majority of these isolates being *S.* Typhimurium the most common phage types being 8, 9, 101 and 156

VTEC/STEC (ERL)

- 21 isolates of *E. coli* O157:H7 were laboratory confirmed (2007, 25)
- 1 family cluster of 3 cases

Shigella (ERL)

- 1 family cluster of 3 cases *Shigella flexneri* 2a

Norovirus (Norovirus Reference Laboratory)

- 43 confirmed norovirus outbreaks were reported, of which 14 (32.6%) occurred in rest home (5) and hospital settings (9), and 6 occurred in child-related settings.
- 7 outbreaks were associated with consumption of oysters
- analysis of the implicated oysters confirmed the presence of Genogroup II noroviruses

- 10 outbreaks occurred in home, hostel, airplane, community event and catered settings. No information on setting was available for 6 outbreaks
- the majority of norovirus outbreak strains identified belonged to GII (41, 95.3%) and only 2 outbreaks were associated with GI strains
- genotyping showed that the predominant genotype was again GII.4, accounting for 18 outbreaks, including 12 outbreaks in healthcare institutions
- all of the GII.4 strains identified were 2006b variants. Other genotypes identified included GI.3, GII.6, GII.7 and various GII recombinant strains
- a novel GII.c/GII.12 recombinant norovirus strain was identified in faecal specimens from the 7 shellfish associated outbreaks
- this strain has not been reported elsewhere in the world and to date analysis of shellfish from these outbreaks has shown presence of the same recombinant strain in one oyster sample

LEGIONELLOSIS & ENVIRONMENTAL LEGIONELLA

- 25 cases were notified this quarter of which 10 were lab-confirmed as cases
- all lab-confirmed cases involved sporadic community acquired cases, with no deaths or outbreaks identified
- of the 10 cases identified, 9 fitted the confirmed case definition and 1 fitted the probable case definition
- the 9 confirmed cases demonstrated either antibody titres >512 on two or more occasions (4 cases), or at least a four-fold rise in antibody titre by the legionella IFAT (2 cases), or a rising antibody titre to >1024 (1 case), or a combination of a positive PCR test and culture-positive sputum (2 cases)
- the probable case exhibited a single high antibody titre >512 (1 case)
- *L. pneumophila* serogroup 1 was identified as the causative agent in 1 case
- *L. longbeachae* serogroup 1 was identified in 3 cases
- for a further 2 *L. longbeachae* cases the serogroup could not be identified
- *L. bozemanii* was identified as the causative agent in 1 case
- *L. dumoffii* was identified as the causative agent in 1 case
- *L. gormanii* was identified as the causative agent in 2 cases
- Legionellae isolated from domestic drinking and recreational water systems, including spa pools included *L. longbeachae* and *L. pneumophila* serogroups 1 and 6
- Legionellae isolated from industrial water systems including cooling towers included *L. anisa, L. rubrilucens* and *L. pneumophila* serogroups 1, 4, 5 and 6
- Legionellae isolated from composts and soils included *L. longbeachae* sg1

RESPIRATORY VIRUSES

Influenza Virus

- 812 influenza viruses were reported from sentinel and laboratory-based surveillance (2007, 630)
- 292 were identified as influenza A, 1 as A/Brisbane/59/2007 (H1N1)–like strain, 99 as A/Brisbane/10/2007 (H3N2)–like strains, 43 as A (H3N2) subtyped by PCR, and 149 as A yet to be subtyped
- 520 were identified as influenza B, 38 as B/Florida/4/2006–like strains, 89 as B/Malaysia/2506/2004–like strains, 393 as B yet to be antigenically typed
- the Australian Influenza Vaccine Committee (AIVC), with a New Zealand representative, met in Canberra on 8 October 2008 to consult on the influenza vaccine composition for 2009. The recommended composition is:

i) A (H1N1) an A/Brisbane/59/2007–like strain

ii) A (H3N2) an A/Brisbane/10/2007–like strain

iii) B a B/Florida/4/2006–like strain

(For more details on the influenza vaccine recommendation, please refer to the report: www.surv.esr.cri.nz/virology/influenza_vaccine.php)

Respiratory Syncytial Virus, Rhinovirus & Parainfluenza Virus

- 556 cases of respiratory syncytial virus were reported (2007, 542)
- 2 rhinoviruses were reported (2007, 5)
- 76 parainfluenza viruses were reported (2007, 55), 29 were subtyped as parainfluenza type 1 and 47 as type 3

ADENOVIRUSES & ENTEROVIRUSES

Adenoviruses

- 115 adenoviruses were reported (2007, 197)
- adenovirus type 8 was the predominant serotype
- 76 adenoviruses were serotyped as adenovirus type 1 (5), type 2 (7), type 3 (6), type 4 (1), type 5 (4), type 8 (52), and type 37 (1)

Enteroviruses

- 31 enteroviruses were reported (2007, 32)
- Echovirus type 6 was the predominant serotype
- 8 enteroviruses were serotyped as Echovirus 4 (1), Echovirus 6 (3), Echovirus 9 (1), Echovirus 11 (1) and Coxsackie virus type B5 (2)

SPECIAL BACTERIOLOGY

Listeria monocytogenes

- 10 isolates of *Listeria monocytogenes* from human cases were referred (for table of human *L. monocytogenes* cases giving more details see www.surv.esr.cri.nz/surveillance/NZPHSR.php)
- 3 cases were perinatal, 2 of them were fatal
- 7 cases were in adults; 6 were elderly and/or had underlying illness, the remaining case had no risk factors identified

Corynebacterium diphtheriae

- 8 isolates of *Corynebacterium diphtheriae* were received for toxigenicity testing, typing and surveillance purposes
- 7 isolates were from cutaneous sources, 5 were var. *mitis* and 2 were var. *gravis* strains
- 1 isolate was from blood of a 7 year old female from Auckland; it was a var. *gravis* strain
- the other patients were from Auckland, Wellington and Christchurch
- all the isolates were determined to be non-toxigenic by PCR examination for the toxin gene

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

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