

# New Zealand Public Health Surveillance Report

## September 2005

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- 58 'final' reports (259 cases); 23 'interim' reports (101 cases)
- 4.5 cases per outbreak on average
- 14 hospitalisations, no deaths

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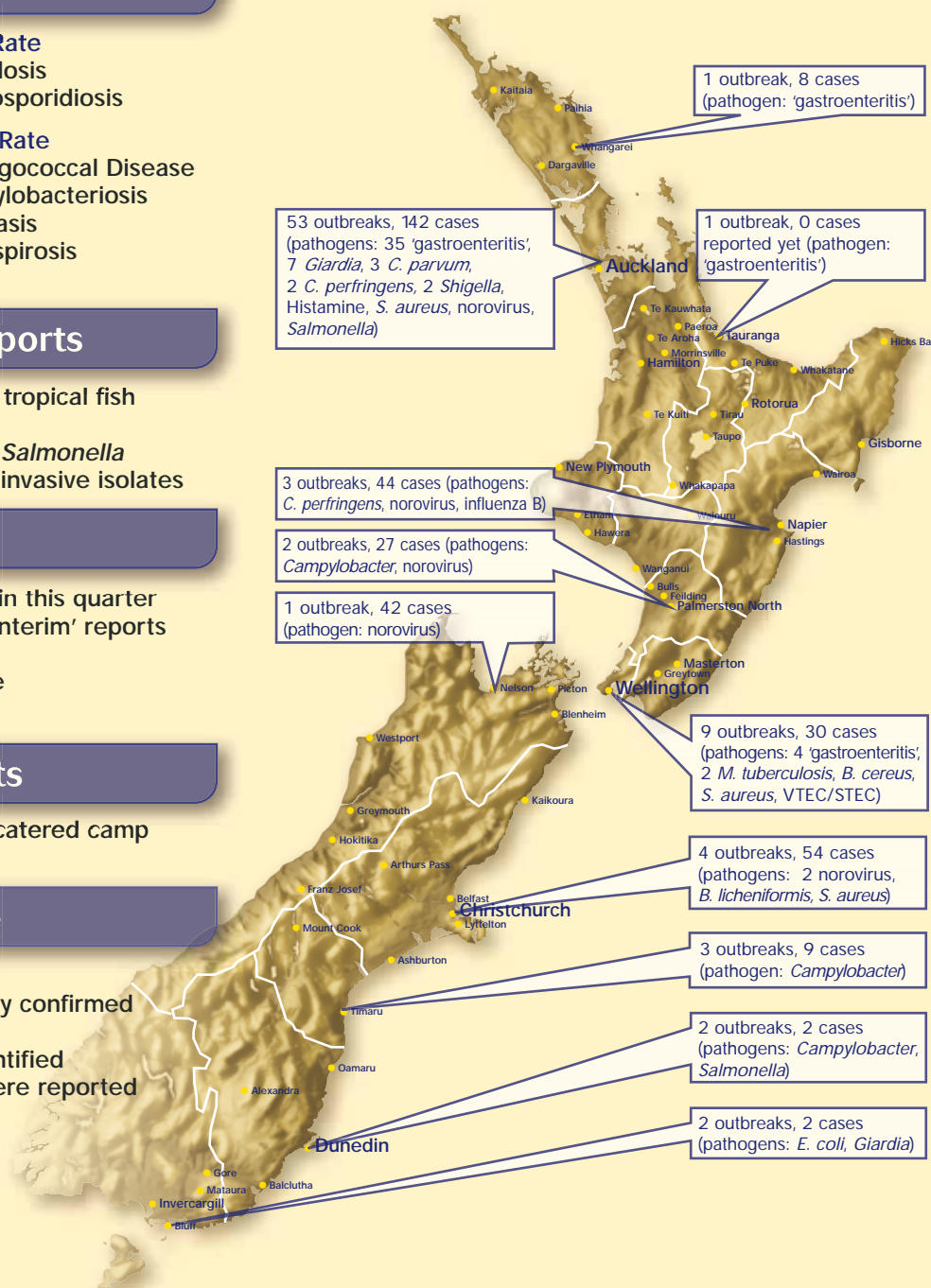
- *Campylobacter* outbreak at a self-catered camp
- Norovirus outbreak at a prison

#### 6. Pathogen Surveillance

- 3 *Salmonella* outbreaks confirmed
- 34 *E. coli* O157:H7 cases laboratory confirmed
- 12 norovirus outbreaks reported
- 13 *Legionella* cases laboratory identified
- 338 isolations of influenza virus were reported

#### This Quarter's Outbreaks

Notification and outbreak data in this issue are drawn from the April-June quarter of 2005. 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 by 11 July 2005.



**Erratum:** In the last issue of the NZPHSR (Volume 3, Issue 2, page 4), the legend on the MRSA isolations chart (Figure 1) was incorrect. The khaki bar represents the EMRSA-15 strain and the dark blue bar represents other MRSA strains.

# 1. Editorial

## Enterobacter sakazakii infection

In New Zealand, as of 21 July 2005, *Enterobacter sakazakii* infection became a notifiable disease, on suspicion, to the Medical Officer of Health.<sup>1</sup> *Enterobacter sakazakii* is a motile, gram-negative, rod-shaped bacterium, belonging to the family Enterobacteriaceae, which contains a number of bacterial species found in the human and animal gut and the environment. The bacterium has been identified as a rare cause of invasive infection in neonates.<sup>2</sup> Internationally there have been 48 cases reported in the English literature from 1961 to 2003.<sup>3</sup> In New Zealand, there have been four identified cases of infection in premature babies (one in 1986, two in 1991, and one in 2004).<sup>1</sup>

While *E. sakazakii* has caused disease in all age groups, most disease has been reported in infants less than two months old. Neonates in hospital settings have the highest risk, especially if pre-term, low-birth-weight or immunocompromised. Infants of HIV-positive mothers are also at risk.<sup>1,3</sup> The organism can cause meningitis, brain abscesses, necrotising enterocolitis, bloody diarrhoea, and sepsis. Illness is often severe and life threatening, with significant long-term sequelae in those who recover. The case-fatality rate of neonatal *E. sakazakii* infection has been reported to be as high as 50%.<sup>2</sup> The US FoodNet 2002 survey found that the rate of invasive *E. sakazakii* infection among infants under one year old was 1 per 100 000.<sup>3</sup>

*Enterobacter sakazakii* can be detected in the gut of healthy humans, most probably as an intermittent guest, and it can also be found in the gut of animals.<sup>3</sup> However, its normal habitat is unclear, and past studies have not isolated the bacterium from environmental sources such as surface water, soil, mud, rotting

wood, grain, bird dung, rodents, domestic animals, cattle, or raw cow's milk.<sup>4</sup> Although, the bacterium's epidemiology and reservoir are unknown, it has been detected in various types of food, but only contaminated powdered infant formula has been linked to outbreaks of disease.<sup>2-5</sup>

"Powdered infant formula is not a sterile product, and low-level contamination is not limited to any particular product brand. In neonatal intensive care settings, powdered infant formula is no longer used unless there is no alternative available. If breastfeeding is not possible, then (sterile, liquid) ready to feed infant formula is used. Guidance for preparing infant formula in the community now includes the following: when preparing powdered infant formula prepare only the amount needed for baby's next feed, so that it can be prepared as close as possible to the feeding time."<sup>1</sup> Further advice on preparation of powdered infant formula can be found on the New Zealand Food Safety Authority website.<sup>6</sup> The generic case report form with instructions on how to complete it for infections with *E. sakazakii* are available on the ESR surveillance website.<sup>7</sup>

For more information please see the following references and websites:

- 1 [www.moh.govt.nz/newsandissues](http://www.moh.govt.nz/newsandissues)
- 2 Lai K.K. 2001. *Enterobacter sakazakii* infection among neonates, infants, children, and adults: case reports and a review of the literature. *Medicine* 80: 113-22.
- 3 [www.who.int/foodsafety/](http://www.who.int/foodsafety/)
- 4 Muyltjens H.L. and Kollee L.A. 1990. *Enterobacter sakazakii* meningitis in neonates: causative role of formula? *Pediatr. Infect. Dis. J.* 9(5): 372-3.
- 5 Centers for Disease Control and Prevention 2002. *Enterobacter sakazakii* infections associated with the use of powdered infant formula—Tennessee, 2001. *JAMA* 287(17): 2204-2205.
- 6 [www.nzfsa.govt.nz](http://www.nzfsa.govt.nz)
- 7 [www.surv.esr.cri.nz/episurv.php](http://www.surv.esr.cri.nz/episurv.php)

## 2. Notifiable Disease Surveillance

The following is a summary of disease notifications for the April-June quarter of 2005 and cumulative notifications and rates calculated for a 12-month period (July 2004 - June 2005). 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 11 July 2005. As this information may be updated over time, these data should be regarded as provisional. The National Surveillance data tables are available online ([www.surv.esr.cri.nz](http://www.surv.esr.cri.nz)).

### VACCINE PREVENTABLE DISEASE

#### Hepatitis B

- **Notifications:** 18 notifications in the quarter (2004, 7); 44 notifications over the last 12-months (2004, 50) giving a rate of 1.2 cases per 100,000 population (2004, 1.3); not a statistically significant decrease
- **Comments:** there has been a statistically significant quarterly increase from the same quarter last year (7 cases). All notifications were aged between 19 and 64 years

#### Measles

- **Notifications:** 4 notifications in the quarter (2004, 8); 23 notifications over the last 12-months (2004, 58) giving a rate of 0.6 cases per 100,000 population (2004, 1.6); statistically significant decrease
- **Comments:** 1 laboratory confirmed case, 2 probable cases and 1 case is under investigation

#### Meningococcal Disease

- **Notifications:** 67 notifications in the quarter (2004, 76); 326 notifications over the last 12-months (2004, 452) giving a rate of 8.7 cases per 100,000 population (2004, 12.1); statistically significant decrease

- **Comments:** notifications were distributed by age as follows, 6 under 1 years of age; 8 (1-4 years); 8 (5-9 years); 14 (10-14 years); and 31 in the 15 and over category. There were 4 deaths, 1 (under 1 years); 1 (20-29 years); 2 (40-49 years); 1 from MidCentral DHB and 3 from Counties Manukau DHB

#### Pertussis

- **Notifications:** 495 notifications in the quarter (2004, 379); 4,277 notifications over the last 12-months (2004, 1,033) giving a rate of 114.4 cases per 100,000 population (2004, 27.6); statistically significant increase
- **Comments:** compared to the last pertussis epidemic peak in the 4th quarter 2004 (1717 cases), both 2005 1st quarter (1001 cases) and 2nd quarter (495 cases) had a statistically significant quarterly decrease, implying that we are reaching the end of the epidemic

### INFECTIOUS RESPIRATORY DISEASES

#### Acute Rheumatic Fever

- **Notifications:** 12 notifications in the quarter (2004, 19); 70 notifications over the last 12-months (2004, 134) giving a rate of 1.9 cases per 100,000 population (2004, 3.6); statistically significant decrease

• **Comments:** notifications were distributed by age as follows, 4 (5-9 years); 6 (10-14 years); 1 (15-19 years); and 1 (20-29 years). All 12 cases were rheumatic fever initial attacks

## ENTERIC INFECTIONS

### Campylobacteriosis

• **Notifications:** 2,213 notifications in the quarter (2004, 2,192); 11,867 notifications over the last 12-months (2004, 14,287) giving a rate of 317.5 cases per 100,000 population (2004, 382.3); statistically significant decrease

### Gastroenteritis

• **Notifications:** 143 notifications in the quarter (2004, 459); 961 notifications over the last 12-months (2004, 1,243) giving a rate of 25.7 cases per 100,000 population (2004, 33.3); statistically significant decrease

• **Comments:** note that this is not a notifiable disease *per se* except in persons with a suspected common source or with a high risk occupation, and 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

### Listeriosis

• **Notifications:** 0 notification in the quarter (2004, 4); 19 notifications over the last 12-months (2004, 25) giving a rate of 0.5 cases per 100,000 population (2004, 0.7); not a statistically significant decrease

• **Comments:** there has been a statistically significant quarterly decrease from the previous quarter (8 cases)

### Salmonellosis

• **Notifications:** 344 notifications in the quarter (2004, 239); 1,201 notifications over the last 12-months (2004, 1,203) giving a rate of 32.1 cases per 100,000 population (2004, 32.2); not a statistically significant decrease

• **Comments:** there has been a statistically significant quarterly increase from the same quarter last year (239 cases)

### Shigellosis

• **Notifications:** 37 notifications in the quarter (2004, 31); 142 notifications over the last 12-months (2004, 106) giving a rate of 3.8 cases per 100,000 population (2004, 2.8); statistically significant increase

### VTEC/STEC Infection

• **Notifications:** 34 notifications in the quarter (2004, 14); 97 notifications over the last 12-months (2004, 91) giving a rate of 2.6 cases per 100,000 population (2004, 2.4); not a statistically significant increase

• **Comments:** there has been a statistically significant quarterly increase from the same quarter last year (14 cases)

## ENVIRONMENTAL EXPOSURES AND INFECTIONS

### Chemical poisoning

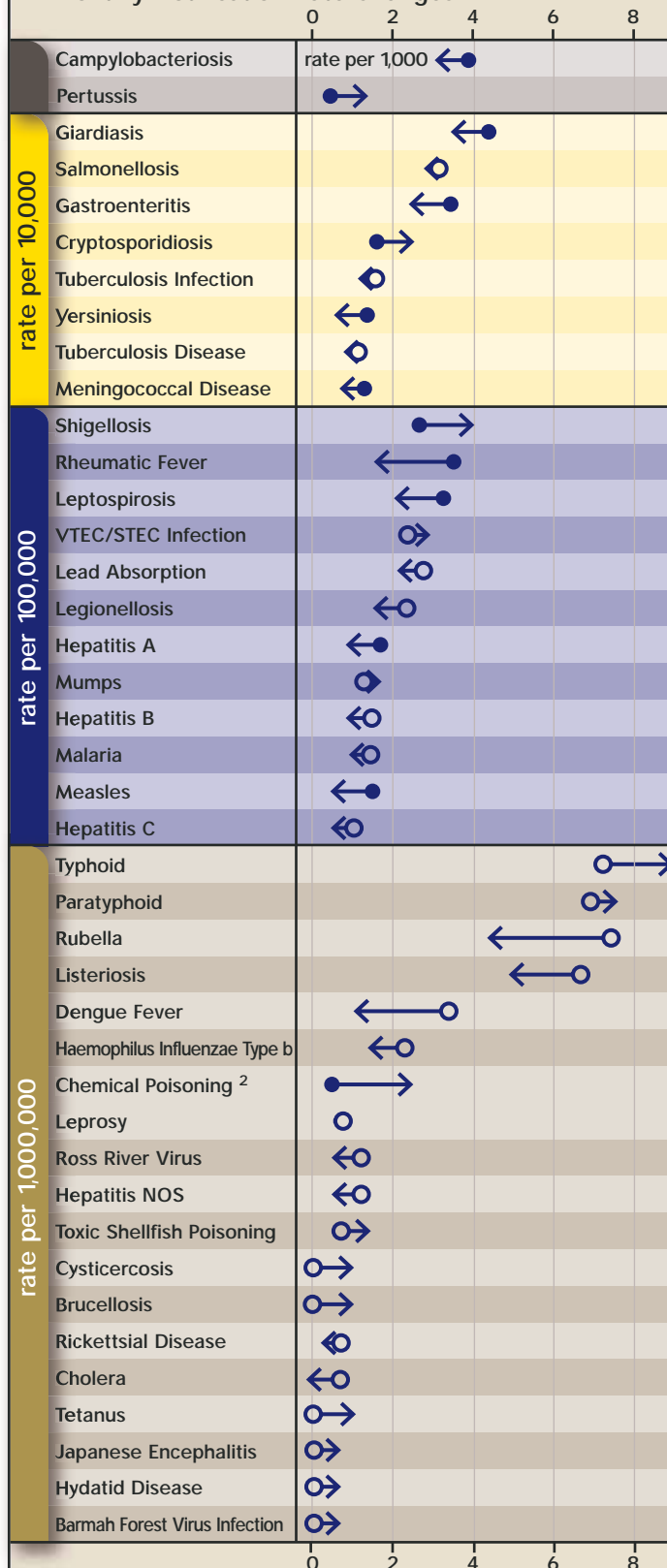
• **Notifications:** 0 notifications in the quarter (2004, 0); 8 notifications over the last 12-months (2004, 1) giving a rate of 0.2 cases per 100,000 population (2004, 0.0); statistically significant increase

### Cryptosporidiosis

• **Notifications:** 130 notifications in the quarter (2004, 41); 767 notifications over the last 12-months (2004, 671) giving a rate of 20.5 cases per 100,000 population (2004, 18.0); statistically significant increase

## National Surveillance Data

### 12-Monthly Notification Rate Changes <sup>(1)</sup>



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

<sup>(1)</sup> Rates are calculated for the 12-month period to the end of this quarter.  
<sup>(2)</sup> from the Environment

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## Giardiasis

- **Notifications:** 307 notifications in the quarter (2004, 368); 1,332 notifications over the last 12-months (2004, 1,584) giving a rate of 35.6 cases per 100,000 population (2004, 42.4); statistically significant decrease

## Hepatitis A

- **Notifications:** 4 notifications in the quarter (2004, 14); 37 notifications over the last 12-months (2004, 65) giving a rate of 1.0 cases per 100,000 population (2004, 1.7); statistically significant decrease
- **Comments:** all notifications were aged between 9 and 50 years, with 2 cases under the age of 16 years

## Leptospirosis

- **Notifications:** 19 notifications in the quarter (2004, 31); 84 notifications over the last 12-months (2004, 119) giving a rate of 2.2 cases per 100,000 population (2004, 3.2); statistically significant decrease
- **Comments:** 1 female case and 18 male cases; 8 meat industry workers, 7 farmers or dairy farmers, 1 plumber, 1 transport operator, 1 stock transporter and 1 coal mines supervisor

## Yersiniosis

- **Notifications:** 87 notifications in the quarter (2004, 114); 345 notifications over the last 12-months (2004, 503) giving a rate of 9.2 cases per 100,000 population (2004, 13.5); statistically significant decrease

## NEW, EXOTIC AND IMPORTED INFECTIONS

### Dengue Fever

- **Notifications:** 2 notifications in the quarter (2004, 2); 5 notifications over the last 12-months (2004, 13) giving a rate of 0.1 cases per 100,000 population (2004, 0.3); not a statistically significant decrease
- **Comments:** 1 female and 1 male case aged between 40-49 years. Both cases were overseas during the incubation period, 1 was returning from Indonesia and the other case was a visitor from Samoa

### Malaria

- **Notifications:** 13 notifications in the quarter (2004, 8); 39 notifications over the last 12-months (2004, 44) giving a rate of 1.0 cases per 100,000 population (2004, 1.2); not a statistically significant decrease
- **Comments:** all notifications were laboratory confirmed. 12 cases had been overseas during the incubation period; 3 to Vanuatu; 2 to Papua New Guinea; 2 to South Africa; 2 to India; 1 to Tonga; 1 to UK and 1 to East Timor (Democratic Republic of Timor-Leste); and 1 case (with *Plasmodium vivax*) had his original malaria episode in Vanuatu earlier this year

## 3. Other Surveillance Reports

### *Salmonella* Paratyphi B var. Java in tropical fish and turtle aquaria

In January 2005, ESR was notified about a possible nationwide outbreak of *Salmonella* Paratyphi B var. Java, whereby five cases had reportedly been in contact with water from tropical fish or turtle aquaria. Retrospective analysis of all cases of *Salmonella* Paratyphi B var. Java in New Zealand from January 2004 to May 2005 resulted in a further nine cases being identified (Table 1).

**Table 1 . Demographics and risk factor details for cases of aquarium acquired *Salmonella* Paratyphi B var. Java in New Zealand, January 2004 – May 2005**

Case	Who	Health District	When	Why	Ho*	Ev†
1	23y M Student	Southland (SO)	Feb 04	Contact with water from tropical fish aquarium at home	N	E
2	9y F	Wellington (WN)	Apr 04	Contact with siblings who had contact with water from turtle tank at home	N	E
3	22y M Pet Shop	Tauranga (TG)	Jun 04	Contact with water from tropical fish aquarium at work	Y	M
4	2y M	North-West Auckland (NW)	Aug 04	Contact with water from turtle tank at home	N	E M
5	21y M Chef	Wellington (WN)	Sep 04	Contact (mouth siphoning) with water from turtle tank at home	Y	E
6	48y M Unemployed	Hawke's Bay (HB)	Oct 04	Contact with water from tropical fish aquarium at home	Y	E M
7	7y M	South Auckland (SA)	Oct 04	Contact with water from tropical fish aquarium at home	Y	E M
8	20y M Unknown	Hutt Valley (HU)	Jan 05‡	Contact (mouth siphoning) with water from tropical fish aquarium at home	U	E
9	4y F	South Auckland (SA)	Feb 05	Contact with water from tropical fish aquarium at home	U	E M
10	28 M Pet Shop	Canterbury (CB)	Apr 05	Contact with water from tropical fish aquarium at work		E M
11	33 M IT Manager	Hutt Valley (HU)	Apr 05	Contact with water from tropical fish aquarium at home	N	E
12	21 F Student	Otago (OT)	Apr 05	Awaiting details	N	
13	22 F Retailer	Hawke's Bay (HB)	May 05	Contact with water from tropical fish aquarium at home	Y	E
14	37y F Marketing	Hutt Valley (HU)	May 05	Suspected contact with water from tropical fish aquarium	N	M

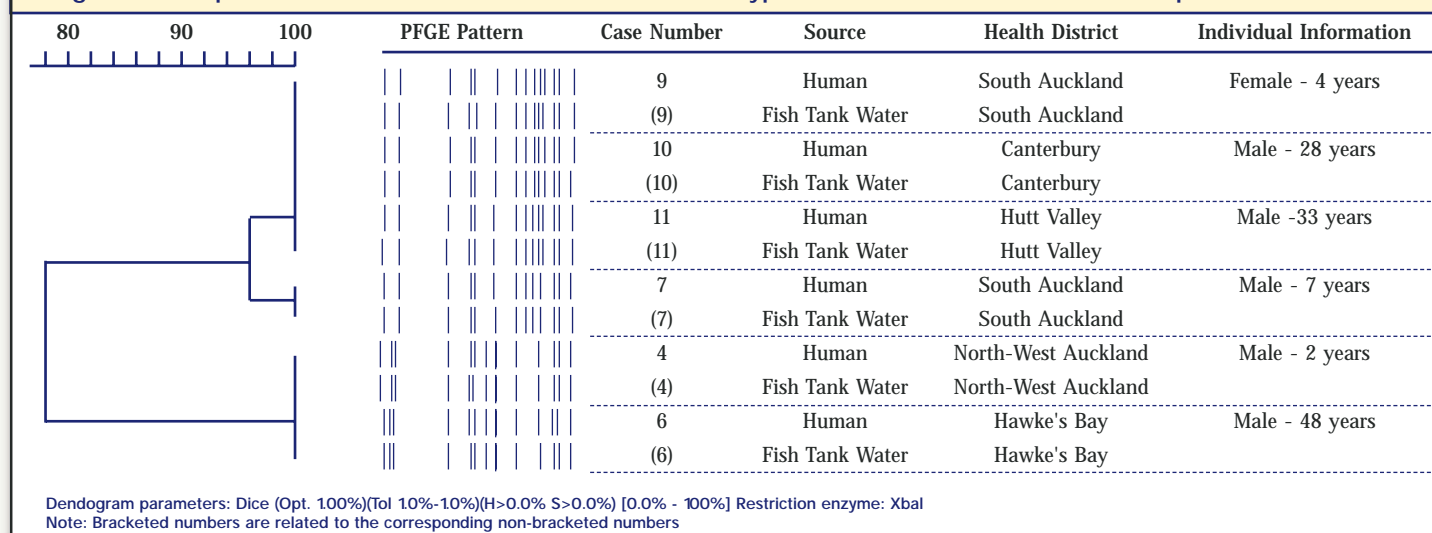
\* Ho = Hospitalised: (Y)es, (N)o or (U)known

† Ev = Evidence supporting source: (E)pidemiological or (M)atch of strains

‡ Report date (onset date unknown)

The five original cases did not appear to be linked, occurring several months apart across New Zealand. Where circumstances allowed, water samples were collected from aquaria owned by the cases, and evaluated for the presence of *Salmonella* spp. In six cases *Salmonella* Paratyphi B var. Java was isolated from the aquarium. Pulsed-Field Gel Electrophoresis (PFGE) patterns of paired human and aquaria water isolates were indistinguishable (Figure 1). PFGE identified three main clusters, one of which was quite distinct from the other two. The association between tropical fish/turtles/aquaria and human cases of *Salmonella* Paratyphi B var. Java has previously been identified in New Zealand<sup>1</sup>, Canada<sup>2</sup>, and Scotland<sup>3</sup>, and appears to have first been documented in 1981.<sup>4</sup>

Figure 1. Comparison of PFGE Patterns of *Salmonella* Paratyphi B var. Java from Human and Aquatic Tank isolates



Following case number seven, (initially the fourth case prior to retrospective analysis) an e-mail was sent to all Medical Officers of Health requesting that any recent or future cases of *Salmonella* Paratyphi B var. Java be questioned as to their contact with tropical fish.

Having determined that several similar cases occurred throughout the country, the Medical Officers of Health communicated with the Biosecurity division at the Ministry of Agriculture and Forestry (MAF). There are approximately 8 to 10 regular importers of tropical fish in New Zealand, and a further 10 who maintain registration with MAF for the occasional importation of fish. They are allowed to import fish provided the species will not survive in New Zealand's streams, lakes, rivers or sea. Importers each have a transitional tank on-site where the fish are held in 'quarantine' for three to six weeks (length of time is dependent upon the species). There is no testing of fish or water from the tanks during the quarantine period. Fish at the end of the quarantine period are then sold to pet stores. Wastewater from the tank is chlorinated and the tanks are cleaned prior to the arrival of the next batch of fish. Any fish that die during quarantine have samples collected for microbiological examination.

No turtles have been imported in to New Zealand since 1995/96, so all turtles now present have been imported pre 1995, bred here or smuggled. The previous import standard for turtles included testing for *Salmonella* spp. The majority of turtles failed and were treated with antibiotics. However, a high proportion still failed. As a result of the number of cases of *Salmonella* infection associated with tropical fish or turtles, advice and a fact sheet have been sent to the Pet Industry Association of New Zealand, to be circulated to all pet-store owners. MAF will distribute this information to current and new importers. This advice has also been sent to the Federation of New Zealand Aquarium Societies to be included in the information on their website, and presented at the annual conference in New Plymouth in June 2005. All public health personnel are requested to determine whether future cases of *Salmonella* Paratyphi B var. Java are linked to contact with tropical fish, and to record this when the case is notified.

- 1 Simmons G. 2002. Reptile-associated Salmonellosis in an Auckland child. *New Zealand Public Health Report* 9(4): 29
- 2 Gaulin C., Vincent C., Alain L., and Ismail J. 2002. Outbreak of *Salmonella* Paratyphi B linked to aquariums in the province of Quebec, 2000. *Canada Communicable Disease Report* 28(11): 89
- 3 Riley A., Hanson M., and Ramsey C. 1992. Tropical fish as a source of *Salmonella* java infection. *Comm Dis Env Health Scotland* 26(25): 4
- 4 Cox R. A., and Robinson J. 1981. *Salmonella* java from tropical fish tanks. *Communicable Disease Report* (31): 4

Reported by Naomi Boxall, Epidemiologist, ESR; Lester Calder, MOH, Hawke's Bay; Annette Nesdale, MOH, Wellington; Phil Shoemack, MOH, Bay of Plenty; Greg Simmons, MOH, Auckland; Carolyn Nicol, Scientist, ESR and Chris Pope, Scientist, ESR. With thanks to all HPO's and EHO's involved in investigating these cases

## Antimicrobial susceptibility among *Salmonella*

Each year a representative sample of non-typhoidal *Salmonella*, chosen from isolates routinely referred to ESR for serotyping, is tested for antimicrobial susceptibility. In addition, all isolates of *S. Typhi*, *S. Paratyphi* A and *S. Paratyphi* B are tested. More detailed information is available on [www.surv.esr.cri.nz/PDF\\_surveillance/Antimicrobial/SAL\\_2004.pdf](http://www.surv.esr.cri.nz/PDF_surveillance/Antimicrobial/SAL_2004.pdf)

Antimicrobial resistance among *Salmonella* remains relatively uncommon. Among the 489 non-typhoidal *Salmonella* tested in 2004, 93% were fully susceptible to all 12 antimicrobials tested. Three percent of isolates were ampicillin resistant and 2% co-trimoxazole resistant. All isolates were susceptible to ciprofloxacin and third-generation cephalosporins.

Among the 34 *S. Typhi* isolates tested in 2004, one was multiresistant to ampicillin, chloramphenicol, co-trimoxazole, nalidixic acid, streptomycin, sulphonamides, tetracycline and trimethoprim. This organism was acquired in Cambodia. Four of the total 21 *S. Paratyphi* B var. Java isolates were multiresistant to ampicillin, chloramphenicol, streptomycin, sulphonamides and tetracycline.

Reported by Helen Heffernan, Communicable Disease Programme, ESR

## Antimicrobial susceptibility among invasive isolates

*Streptococcus pneumoniae*, *Neisseria meningitidis* and *Haemophilus influenzae* isolated from normally sterile sites are routinely referred to ESR for the national laboratory-based surveillance of invasive disease due to these organisms. The antimicrobial susceptibility of all viable invasive isolates of these three organisms referred in 2004 was tested. More detailed information is available on [www.surv.esr.cri.nz/antimicrobial/antimicrobial\\_resistance.php](http://www.surv.esr.cri.nz/antimicrobial/antimicrobial_resistance.php)

### *Streptococcus pneumoniae*

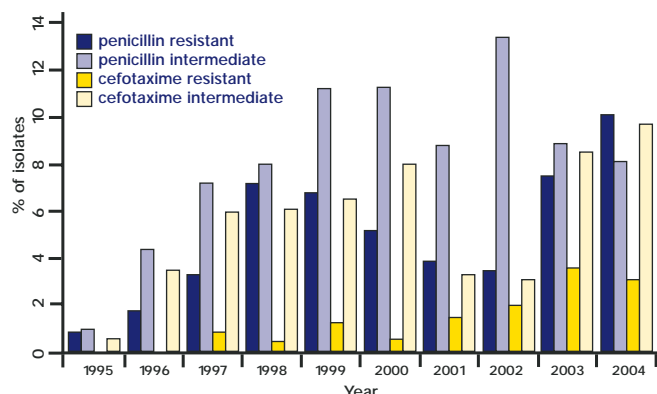
The antimicrobial susceptibility of 545 invasive *S. pneumoniae* isolates was tested in 2004. Penicillin resistance increased in 2003 and 2004, following four successive years of declining resistance between 1999 and 2002 (Figure 2). In 2004, 10% of invasive pneumococci were penicillin resistant (MIC  $\geq 2$  mg/L) and 8% had intermediate penicillin resistance (MIC 0.12-1 mg/L).

Applying the CLSI/NCCLS meningitis interpretive standards, 3% of the invasive pneumococci in 2004 were cefotaxime resistant (MIC  $\geq 2$  mg/L) and 10% had intermediate cefotaxime resistance (MIC 1 mg/L). Applying the non-meningitis interpretive

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standards, 1% were cefotaxime resistant (MIC  $\geq 4$  mg/L) and 2% had intermediate cefotaxime resistance (MIC 2 mg/L). There has been a trend of increasing resistance to third-generation cephalosporins in recent years, although no increase was evident

**Figure 2. Penicillin and cefotaxime\* resistance among invasive *S. pneumoniae*, 1995-2004**



\* cefotaxime susceptibility based on the CLSI/NCCLS meningitis interpretive standards

in 2004 (Figure 2). All isolates were vancomycin susceptible. In 2004, capsular antigen types 9V, 19F, 14, 6B and 23F accounted for 98% of the penicillin-resistant invasive pneumococci, while types 19F and 14 accounted for 82% of the cefotaxime-resistant isolates.

### *Neisseria meningitidis*

The antimicrobial susceptibility of 180 meningococcal isolates from cases of invasive disease in 2004 was tested. All isolates were susceptible to penicillin, ceftriaxone, rifampicin and ciprofloxacin. Sixteen percent of isolates had reduced penicillin susceptibility, with MICs of 0.12-0.5 mg/L. Isolates with reduced penicillin susceptibility have been increasing over the last 10 years. However, meningococcal infections due to such isolates are still treatable with penicillin.

### *Haemophilus influenzae*

The antimicrobial susceptibility of 45 invasive *H. influenzae* isolates was tested in 2004. Three of the 45 isolates were serotype b. Twenty-four percent of isolates were ampicillin resistant. There was no resistance to cefotaxime or rifampicin.

Reported by Helen Heffernan, Communicable Disease 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 (April - June 2005). Comparisons are made to the previous quarter (January - March 2005), and to the same quarter in the previous year (April - June 2004). Note that the outbreak data in this section are notified to ESR by the Public Health Services.

### General

- 81 outbreaks notified in this quarter (360 cases)
  - 58 are 'final' reports (259 cases); 23 are 'interim' reports (101 cases) that have yet to be finalised and closed
- All following data are pertaining to final reports only*
- 4.5 cases on average per outbreak, compared with 12.0 cases per outbreak in the previous quarter (14.5 cases per outbreak in the same quarter of last year)
  - 14 hospitalisations and no deaths this quarter.  
Hospitalisations: gastroenteritis (5 cases), VTEC/STEC (3 cases), *Mycobacterium tuberculosis* (3 cases), campylobacteriosis (1 case), norovirus (1 case), cryptosporidiosis (1 case)

### Pathogens

- 27 'gastroenteritis' outbreaks (74 cases) during this quarter
- 6 *Giardia* outbreaks (20 cases)
- 5 norovirus outbreaks (94 cases)
- 5 *Campylobacter* outbreaks (18 cases)
- 3 *Cryptosporidium* outbreaks (12 cases)
- 3 *Clostridium perfringens* outbreaks (11 cases)
- 2 *Staphylococcus aureus* outbreaks (5 cases)
- 1 VTEC/STEC outbreak (4 cases)
- 1 *Salmonella* outbreak (no cases reported to date)
- 1 *Mycobacterium tuberculosis* outbreak (3 cases)
- 1 influenza B outbreak (12 cases)
- 1 histamine outbreak (2 cases)
- 1 *E. coli* outbreak (2 cases)
- 1 *Bacillus cereus* 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.

- 22 person-to-person, from (non-sexual) contact with an infected person (including droplets): 9 gastroenteritis

(25 cases), 5 *Giardia* (18 cases), 3 norovirus (75 cases), 3 *Cryptosporidium* (12 cases), 1 influenza B (12 cases), and 1 *Mycobacterium tuberculosis* (3 cases)

- 1 environmental, from contact with an environmental source (e.g. swimming): norovirus (26 cases)
- 34 foodborne, from consumption of contaminated food or drink (excluding water): 22 gastroenteritis (62 cases), 3 *Clostridium perfringens* (11 cases), 3 *Campylobacter* (9 cases), 2 *Staphylococcus aureus* (5 cases), 1 VTEC/STEC (4 cases), 1 norovirus (2 cases), 1 histamine (2 cases) and 1 *Bacillus cereus* (2 cases)
- 2 waterborne, from consumption of contaminated drinking water: 1 *Giardia* (4 cases) and 1 gastroenteritis (3 cases)
- 9 mode of transmission unknown: 4 gastroenteritis (9 cases), 1 norovirus (17 cases), 1 *Campylobacter* (7 cases), 1 *Giardia* (2 cases), 1 *E. coli* (2 cases), and 1 *Salmonella* (no cases reported to date)

### 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.

- 18 café: 12 gastroenteritis (32 cases), 2 *Clostridium perfringens* (6 cases), 2 *Campylobacter* (5 cases), 1 norovirus (2 cases) and 1 *Salmonella* (no cases reported to date)
- 8 takeaways: 6 gastroenteritis (15 cases), 1 *Clostridium perfringens* (5 cases) and 1 *Bacillus cereus* (2 cases)
- 4 supermarket: 3 gastroenteritis (6 cases) and 1 *Staphylococcus aureus* (2 cases)
- 3 rehome: norovirus (75 cases)
- 1 'other food supply': gastroenteritis (3 cases)
- 1 camp: *Campylobacter* (7 cases)
- 1 school: influenza B (12 cases)
- 1 workplace: gastroenteritis (3 cases)
- 21 outbreaks with no setting selected: 6 *Giardia* (20 cases), 3 *Cryptosporidium* (12 cases), 4 gastroenteritis (9 cases), 2 *Campylobacter* (6 cases), 1 norovirus (17 cases), 1 VTEC/STEC (4 cases), 1 *Staphylococcus aureus* (3 cases), 1 *Mycobacterium tuberculosis* (3 cases), 1 histamine (2 cases) and 1 *E. coli* (2 cases)



## 5. Outbreak Case Reports

### *Campylobacter* outbreak at a self-catered camp

A self-catering camp, near Nelson, was used by a group of 58 people between 27 – 31 December 2004. During, or shortly following the four-day camp, 13 attendees developed symptoms suggestive of campylobacteriosis. Three of these cases were confirmed by laboratory testing. Apart from being part of the camping group, the three cases had no risk factors in common.

An investigation following the notification of the index case included an examination of the water system and review of rainfall data for the duration of the camp. A questionnaire was completed for seven cases interviewed, and was e-mailed or posted to 40 other attendees of the camp, based on the symptoms of disease, food from the menu and the list of activities that occurred during the four days. The response rate to the questionnaire was 22.5%, with nine out of 40 returned. Interviews identified further cases. No obvious risk factors relating to the activities undertaken and food consumed during the camp were identified from analysis of the questionnaire data.

Potable water at the camp flows through a gravity operated system, and is sourced from a nearby spring. This water travels through a coarse filter into two inter-connected concrete storage tanks, then into an additional alkathene storage tank before being available at the camp taps. Recreational water that included a pond for kayaking, swimming etc. was discoloured and had noticeable algae growth around the edges. The pond water was not treated, and due to low flow rates is thought to have long water retention times.

Water samples collected from the spring, one concrete storage tank, a kitchen tap and the pond, were evaluated for the presence of faecal coliforms (indicated by the presence of *E. coli*) and *Campylobacter* spp. *E. coli* was found in the pond, storage tank and kitchen tap samples (57, 11 and 2 CFU/100ml, respectively) but not from the spring source. Though the water from the concrete storage tank was not tested for *Campylobacter* spp., all other water samples were negative for *Campylobacter* spp.

During the camp, the potable water 'ran out', and one camp member 'switched' between the two concrete storage tanks. This anecdotal report conflicts with the site investigation, raising questions as to the actual configuration of the water supply. There is the potential for sludge from the concrete tanks to enter the water system if the two tanks are used separately and switched between when one supply is exhausted.

Recommendations following the investigation of this outbreak were:

- (1) The water supply should be registered.
- (2) A boil water notice was issued.
- (3) A permanent treatment plant needs to be installed.
- (4) The pond must be cleaned and regularly tested, especially following a heavy rainfall event (>20mm).
- (5) The storage tanks must be cleaned to remove sludge.

Reported by Kirsten Todd, Health Protection Technician, Nelson Marlborough Public Health Service, Nelson Marlborough District Health Board

### Norovirus outbreak at a prison

Regional Public Health was notified on 25 February 2005 of a foodborne disease outbreak involving about 40 prisoners with symptoms of diarrhoea, vomiting, abdominal pain, and nausea. An investigation was launched immediately. The investigative team was comprised of three HPO's and one Public Health Registrar, none of whom had prior experience of a disease outbreak within a prison environment. The team leader of the Prison Health Unit provided assistance at the prison. Following the initial suspicion of a foodborne outbreak, two HPO's conducted an inspection of the prison kitchen.

A foodborne questionnaire was designed using the menu served during the likely exposure period 22 – 24 February 2005. Low response rates were expected, as literacy skills are low within the population. Prison nurses supervised the administration of the questionnaires, to reduce non-compliance or false information being given. Due to a misunderstanding, no questionnaires were filled in by those who did not become ill. Although 28 prisoners were recorded in prison logs as having been ill, only 19 completed the questionnaire – four of whom did not fit the case definition of exhibiting symptoms within a set period of time. The ill prisoners lived mainly in two units, although single cases also occurred in six other units. Faecal specimens were requested and tested for bacterial pathogens, protozoan parasites, toxins and norovirus. Given the median duration and symptoms of the illness, norovirus was suspected. Consequently, health advice for norovirus infection control was provided to the Team Leader of the Prison Health Unit immediately.

Though the initial notification alluded to a foodborne outbreak, further information from a prison nurse indicated that three prison officers were on sick leave with vomiting and diarrhoea on the same day that the prisoners were ill. The officers and prisoners do not eat the same food, but the officers had been in the cells of the ill prisoners and had had personal contact with them. This suggested the disease was spread by person-to-person transmission, providing more evidence to support the working diagnosis of norovirus. A total of five faecal specimens were collected, all were negative for bacterial pathogens, protozoan parasites and toxins. Three were positive for norovirus.

A second visit was made to examine the cells, living conditions, and to observe inmate movement and interaction with staff within one of the units affected. This provided insight into the likely degree of person-to-person spread amongst inmates and staff. From the case data collected, the overall attack rate for this outbreak was estimated to be less than 2%. This is surprising given the potential high degree of person-to-person contact within the two units in which the outbreak predominantly occurred (120 prisoners). Possible explanations include: a generally healthy/fit male population, a non-highly-infectious strain of norovirus, and prevention of spread via the toilet cleaning protocol (prisoners clean their own cell toilet), and the use of bleach to clean toilets and hard surfaces.

Despite the intensity of the investigation, the source of this outbreak was not ascertained. There are many means by which norovirus could have been introduced to the prison: via infected prison staff, visitors or when prisoners with escorts returned to the grounds having left for medical and/or legal consultations.

Recommendations include:

- (1) A specific set of guidelines for norovirus infection control be added to the Prison infection control plans.
- (2) The prison should develop a sickness policy for the kitchen, and rigorously follow appropriate exclusions for staff or prisoners with enteric illness.
- (3) The prison should conduct a thorough HACCP study on the kitchen and foods produced, and cross-contamination issues are addressed in the kitchen.
- (4) RPH examine improved methods of questionnaire delivery via a third party.

Reported by Quentin Ruscoe, Health Protection Officer, Regional Public Health, Hutt Valley District Health Board

## 6. Pathogen Surveillance

Unless otherwise reported, pathogen surveillance covers the April - June 2005 quarter.

### ENTERIC PATHOGENS

#### Salmonella

Human and non-human *Salmonella* isolate data are available at [www.surv.esr.cri.nz/enteric\\_reference/enteric\\_reference.php](http://www.surv.esr.cri.nz/enteric_reference/enteric_reference.php)

- 390 human and 317 non-human isolates were submitted to ERL (2004: 283 and 220 respectively)
- *S. Enteritidis* phage type 9a, North West Auckland, 8 cases traced to a café
- *S. Typhimurium* phage type 1, Nelson/Marlborough, 26 cases, no common exposure
- *S. Typhi*, South Auckland, household cluster 4 cases, recent travel Samoa
- *S. Colindale* 6, 7: r : 1,7, new serotype in New Zealand, isolated from sesame seed based product
- *S. Amsterdam* 15+, *S. Orion* 15+, *S. Tennessee* and Group E 3, 19: i : -, also isolated from 2 batches of sesame seed based product in recent months

#### VTEC/STEC

- 34 laboratory confirmed cases of *E. coli* O157:H7 (2004, 14 cases)
- PFGE and phage typing performed on 23 April isolates
- 4 separate clusters identified but no common exposure link identified
- isolate from human case from Nelson/Marlborough and isolate from implicated water supply had distinct phage types and PFGE patterns

#### Norovirus

- 12 outbreaks were reported
- 5 (41.7%) outbreaks occurred in rest homes and hospitals
- 7 outbreaks occurred in home, catering and child-associated settings
- in contrast to 2004, a range of genotypes have been identified (GI/3, GII/2, GII/6,7,9 and GII/1,4,8). The 2004 variant GII/4 strain was identified in 2 outbreaks but not in healthcare settings

### LEGIONELLOSIS AND ENVIRONMENTAL LEGIONELLA

- 13 legionellosis cases were laboratory identified
- all 13 cases have been notified, with a further 4 notified cases not laboratory-confirmed
- at the time of their notification, all cases appeared sporadic in nature with no cases associated with an outbreak, although the large increase in *Legionella pneumophila* cases notified in the Canterbury health district in July 2005 has instigated an outbreak investigation, with some of the June cases being associated with that investigation
- of the 13 cases, 8 fitted the confirmed case definition and 5 fitted the probable case definition
- 3 notified cases showed high antibody titres against all antigen pools, making the serological findings indeterminate
- a further notified case was laboratory-tested and was not proven to be a case
- 8 confirmed cases demonstrated either antibody titres >512 on two or more occasions (3 cases), or at least a four-fold rise in antibody titre by the legionella IFAT (2 cases), or a rising titre to at least 512 (1 case), or isolation of legionella from the respiratory tract (2 cases)

- 5 probable cases showed an elevated titre above 512 on one occasion (3 cases) or a positive UAT (2 cases)
- 1 death due to legionellosis has been reported this quarter and 1 case notified in June died early July
- *L. pneumophila* serogroup 1 was identified as the causative agent in 11 cases
- *L. longbeachae* serogroup 2 was identified in a further case
- 1 infection was caused by *L. gormanii*
- Legionellae isolated from potable water sources included *L. pneumophila* serogroup 6 and *L. anisa*
- Legionellae isolated from industrial water systems including cooling towers were *L. pneumophila* serogroups 1, 5, 6, & 8, *L. anisa* and *L. feeleii*
- no environmental *Legionella* isolated, above, is case-associated

### RESPIRATORY VIRUSES

#### Influenza Virus

- 338 isolations of influenza virus were reported (2004, 10)
- 14 were typed as influenza A and 324 as influenza B
- 4 of the type A were sub-typed as A/Wellington/1/2004 (H3N2)-like and 4 were sub-typed as A/California/7/2004 (H3N2)-like
- 221 of the type B were antigenically typed as B/HongKong/330/2001-like, 46 as B/Shanghai/361/2002-like and 10 as B/Sichuan/379/99-like

#### Respiratory Syncytial Virus, Rhinovirus & Parainfluenza Virus

- 77 cases of respiratory syncytial viruses were reported (2004, 110)
- 11 isolations of rhinoviruses were reported (2004, 23)
- 22 isolations of parainfluenza virus, type 1 (1), type 2 (7) and type 3 (14)

### ADENOVIRUSES AND ENTEROVIRUSES

#### Adenoviruses

- 63 adenoviruses were reported (2004, 57)
- Adenovirus type 37 was the predominant serotype
- 63 adenoviruses were serotyped as adenovirus type 1 (2), type 2 (1), type 3 (16), type 4 (10), type 5 (3), type 8 (1), type 13 (1), type 37 (27) and untypable (2)

#### Enteroviruses

- 44 enteroviruses were reported (2004, 42)
- 12 enteroviruses were serotyped as Coxsackie B1 (2), Coxsackie B3 (2), Coxsackie A4 (2), Echovirus 9 (1) and Echovirus 30 (5)

### SPECIAL BACTERIOLOGY

#### Listeria monocytogenes

- 1 isolate of *Listeria monocytogenes* from a human case was referred (for table of human *L. monocytogenes* cases giving more details see [www.surv.esr.cri.nz](http://www.surv.esr.cri.nz))
- the case was an elderly adult

#### Corynebacterium diphtheriae

- 2 isolates of *Corynebacterium diphtheriae* were received for toxigenicity testing, typing and surveillance purposes
- both isolates (1 var. *mitis*, 1 var. *gravis*) were from cutaneous sources; patients were aged 2 m and 58 y and came from Auckland
- both isolates were non-toxigenic by PCR examination for the toxin gene



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