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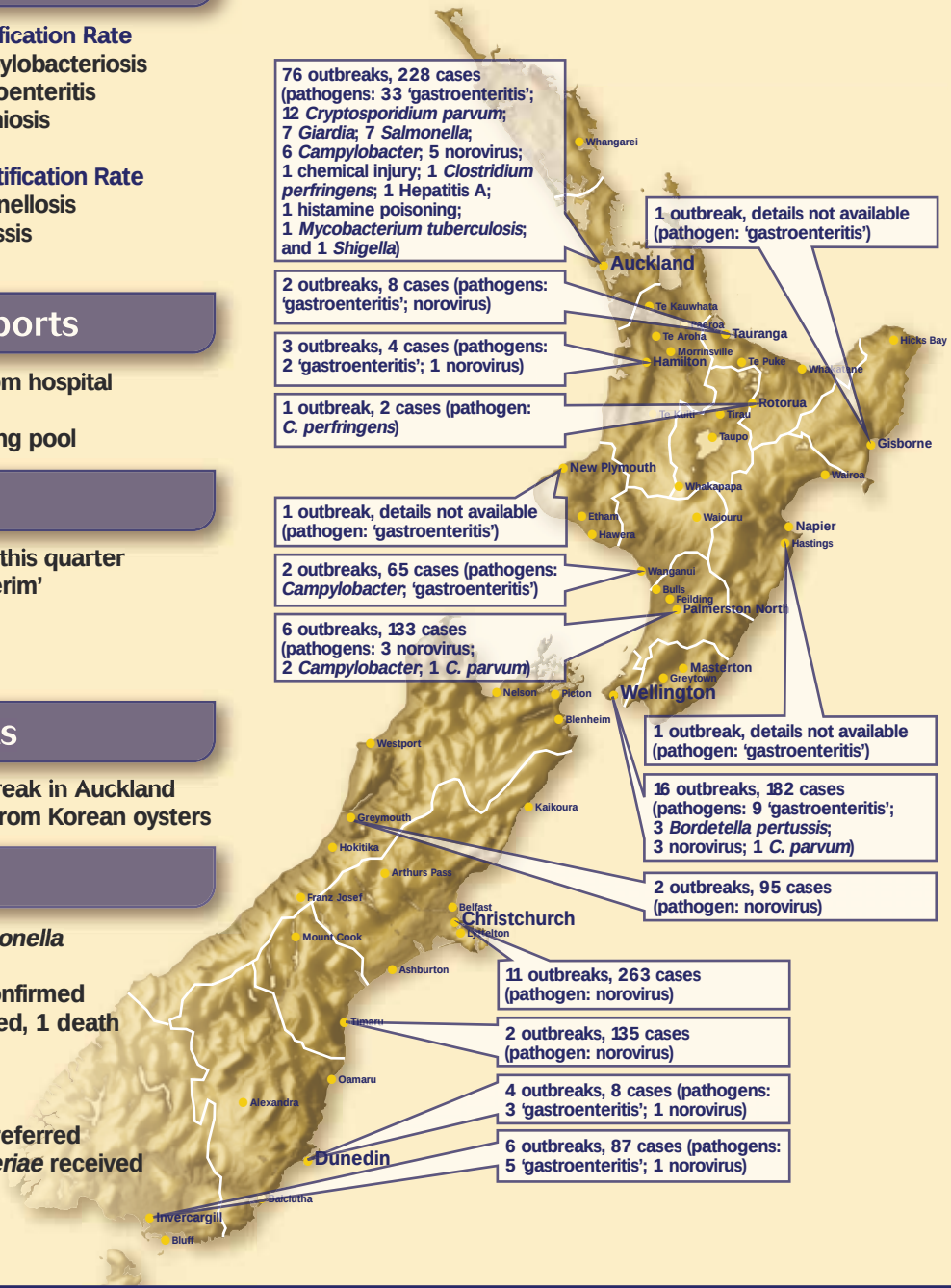
New Zealand Public Health Surveillance Report

March 2007

Contents & Highlights

This Quarter's Outbreaks

Notification and outbreak data in this issue are drawn from the October – December quarter of 2006. 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 15 January 2007.



Latest reports from STI Surveillance, Antimicrobial Resistance, Virology and Enteric Reference Laboratory are available at www.surv.esr.cri.nz

1 Editorial

Infectious disease modelling and reproductive number R_0

New Zealand's geographical isolation has some advantages for its citizens in protecting them from emerging infectious disease. In the case of pandemic influenza, it's most likely that the epidemic will have already started elsewhere and border control measures will be able to play some part in preventing importation. The most likely scenario will be the introduction of virus from an infected traveller arriving by air, that has not been detected by screening at the border or who at the time of border crossing was asymptomatic but incubating the disease.

Assuming this traveller has made his or her way into the country how do we know what the impact will be and what responses will be the most effective?

Epidemiologists and mathematicians employ the use of models. The most basic model for infectious diseases is the SEIR model which attempts to describe the transmission dynamics of a new virus by modelling the susceptible population (S), the latent infection or exposed (E), the infectious but undetected (IU), the infectious but isolated (ID) and the recovered and immune (R). The result is an epidemic curve.

These models of transmission are able to assess the likelihood of an outbreak when our infected traveller is introduced into a susceptible population, and give some understanding as to the impact of disease control measures. They can calculate the number of people likely to become infected and the time to the peak incidence in the outbreak.

A term used widely in modelling is the basic reproductive number of an infection R_0.[1] This is defined as the expected number of secondary infectious cases generated by an average infectious case in an entirely susceptible population. R_0 therefore determines the potential for an infectious agent to start an outbreak, the extent of transmission in the absence of control measures, and the ability of control measures to reduce spread. R_0 can be expressed as $R_0 = khD$, where k is the number of contacts each infectious individual has per unit time (e.g. in a day), h is the probability of transmission per contact between an infectious case and a susceptible person, and D is the mean duration of infectiousness in the infected person. For an outbreak to occur R_0 must be greater than 1.

Experience of outbreaks in the past indicates influenza typically has an R_0 ~2, measles in England 1950 R_0 ~ 13, SARS 2003 R_0 = 2.2 – 3.6, poliomyelitis USA 1955 R_0 ~ 5.[2] R_0 varies from outbreak to outbreak. In cities the population density is higher, the number of contacts is higher, and so R_0 is higher. In rural areas the number of susceptible people an infected individual may have contact with may be so low that R_0 is < 1, and the outbreak cannot start or if started elsewhere cannot be sustained.

In contrast to R_0, the effective reproductive number, R, measures the number of secondary cases generated by an infectious case once an epidemic is underway. In the absence of control measures, $R = R_0x$, where x is the proportion of the susceptible population. During the course of an epidemic, the value of R becomes smaller because of the depletion of susceptible people in the population and the implementation of specific control measures. To stop an outbreak, R must be maintained below 1.

Disease control measures all add to the eventual reduction of R.[3] If a vaccine is available, then pre vaccination, targeted or mass vaccination of a population during the outbreak will reduce the size of the susceptible population (S). Contact tracing combined with quarantine can also remove those with latent infection (E) and those with detected and undetected infection (I). Modelling studies have shown that for pandemic influenza, targeted antiviral treatment and prophylaxis is able to prevent 45% of all transmission. What's important from an epidemiologic perspective is that prevention of transmission need not be 100% effective. The reproductive number does not need to be zero to bring the epidemic under control, only reduced and maintained below one.

Early intervention gives the best chance of success. The scale of interventions required to control an outbreak depends on the number of infectious cases present at the time the control measures are instituted and includes logistical constraints, such as availability of isolation facilities. Considerable effort is necessary to implement such measures in those settings where transmission is ongoing, but such efforts will be essential to quell local outbreaks and reduce the risk of further transmission.

1 Lipsitch M, Cohen T, Cooper B, Robins J, Ma S, James L, et al. 2003. Transmission Dynamics and Control of Severe Acute Respiratory Syndrome. *Science* 300: 1966.

2 Massad E. Mathematical Modelling of Infectious Disease Conference, April 2005, Singapore.

3 Roberts M, Baker M, Jennings C, Serston G, Wilson N. 2006. A Model For The Spread And Control Of Pandemic Influenza In An Isolated Geographical Region. *Journal of Royal Society Interface* (published online): doi10.1098/rsif.2006.0176

Reported by Bruce Adlam, Population and Environmental Health Programme, ESR

2. Notifiable Disease Surveillance

The following is a summary of disease notifications for the October - December quarter of 2006 and cumulative notifications and rates calculated for a 12-month period (January – December 2006). 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 15 January 2007. 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

Mumps

- *Notifications:* 21 notifications in the quarter (2005, 16); 50 notifications over the last 12 months (2005, 61) giving a rate of 1.3 cases per 100,000 population (2005, 1.6); not a statistically significant decrease
- *Comments:* There has been a significant quarterly increase from the previous quarter (9 cases)

Pertussis

- *Notifications:* 161 notifications in the quarter (2005, 642); 1,120 notifications over the last 12 months (2005, 2,719) giving a rate of 30.0 cases per 100,000 population (2005, 72.8); statistically significant decrease

• *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (326 cases) and from the same quarter last year (642 cases)

INFECTIOUS RESPIRATORY DISEASES

Acute Rheumatic Fever

• *Notifications:* 18 notifications in the quarter (2005, 25); 107 notifications over the last 12 months (2005, 79) giving a rate of 2.9 cases per 100,000 population (2005, 2.1); statistically significant increase

• *Comments:* notifications were distributed by age as follows, 1 (less than 1 year); 5 (5-9 years); 10 (10-14 years) and 2 (15-19 years); 17 cases had rheumatic fever initial attacks with 1 case of recurrence attack

Meningococcal Disease

• *Notifications:* 40 notifications in the quarter (2005, 44); 160 notifications over the last 12 months (2005, 226) giving a rate of 4.3 cases per 100,000 population (2005, 6.0); statistically significant decrease

• *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (60 cases). Notifications were distributed by age as follows, 12 (less than 1 year); 8 (1-4 years); 2 (5-9 years); 7 (15-19 years) and 11 (20 and over years); 1 death was reported in this quarter

Tuberculosis Disease

• *Notifications:* 94 notifications in the quarter (2005, 80); 362 notifications over the last 12 months (2005, 340) giving a rate of 9.7 cases per 100,000 population (2005, 9.1); not a statistically significant increase

• *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (123 cases); 91 new cases and 3 reactivated cases; 61 cases were laboratory confirmed, 26 are listed as probable, 3 cases are under investigation and the status of 4 cases is unknown

ENTERIC INFECTIONS

Campylobacteriosis

• *Notifications:* 4,395 notifications in the quarter (2005, 4,648); 15,874 notifications over the last 12 months (2005, 13,836) giving a rate of 424.8 cases per 100,000 population (2005, 370.2); statistically significant increase

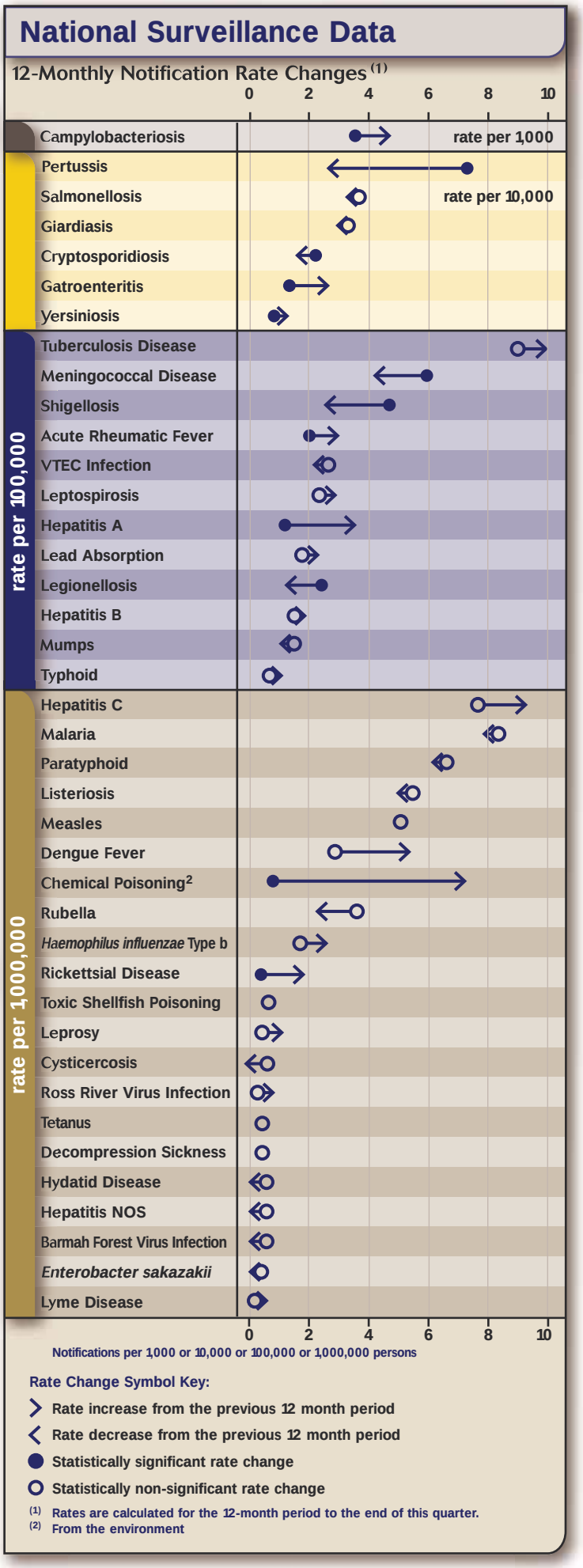
• *Comments:* there has been a statistically significant quarterly increase from the previous quarter (3,519 cases) and a statistically significant quarterly decrease from the same quarter last year (4,648 cases)

Gastroenteritis

• *Notifications:* 161 notifications in the quarter (2005, 105); 925 notifications over the last 12 months (2005, 557) giving a rate of 24.8 cases per 100,000 population (2005, 14.9); a statistically significant increase

• *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (105 cases); 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

National Surveillance Data



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 to the end of this quarter.
(2) From the environment

continued...

Salmonellosis

- *Notifications:* 304 notifications in the quarter (2005, 374); 1,334 notifications over the last 12 months (2005, 1,382) giving a rate of 35.7 cases per 100,000 population (2005, 37.0); not a statistically significant decrease
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (374 cases)

Shigellosis

- *Notifications:* 22 notifications in the quarter (2005, 93); 102 notifications over the last 12 months (2005, 183) giving a rate of 2.7 cases per 100,000 population (2005, 4.9); statistically significant decrease
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (93 cases)

Typhoid

- *Notifications:* 22 notifications in the quarter (2005, 4); 42 notifications over the last 12 months (2005, 30) giving a rate of 1.1 cases per 100,000 population (2005, 0.8); not a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (7 cases) and from the same quarter last year (4 cases)

ENVIRONMENTAL EXPOSURES AND INFECTIONS

Chemical Poisoning

- *Notifications:* 23 notifications in the quarter (2005, 0); 27 notifications over the last 12 months (2005, 3) giving a rate of 0.7 cases per 100,000 population (2005, 0.1); statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (1 case) and from the same quarter last year (0 cases)

Cryptosporidiosis

- *Notifications:* 323 notifications in the quarter (2005, 362); 734 notifications over the last 12 months (2005, 889) giving a rate of 19.6 cases per 100,000 population (2005, 23.8); statistically significant decrease
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (232 cases)

Hepatitis A

- *Notifications:* 12 notifications in the quarter (2005, 17); 122 notifications over the last 12 months (2005, 51) giving a rate of 3.3 cases per 100,000 population (2005, 1.4); statistically significant increase
- *Comments:* all notifications were aged between 5 and 77 years, with 2 cases under the age of 16 years

Legionellosis

- *Notifications:* 18 notifications in the quarter (2005, 23); 57 notifications over the last 12 months (2005, 85) giving a rate of 1.5 cases per 100,000 population (2005, 2.3); statistically significant decrease

Yersiniosis

- *Notifications:* 153 notifications in the quarter (2005, 117); 487 notifications over the last 12 months (2005, 407) giving a rate of 13.0 cases per 100,000 population (2005, 10.9); statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (113 cases) and from the same quarter last year (117 cases)

NEW, EXOTIC AND IMPORTED INFECTIONS

Dengue Fever

- *Notifications:* 9 notifications in the quarter (2005, 1); 20 notifications over the last 12 months (2005, 11) giving a rate of 0.5 cases per 100,000 population (2005, 0.3); not a statistically significant increase
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (1 case) and from the same quarter last year (1 case); 8 cases were laboratory confirmed and 1 case is listed as probable; 8 cases were overseas during the incubation period and the travel history of 1 case is unknown. Countries visited were Thailand, India, Bangladesh, Rarotonga, Singapore, Vietnam, and Cook Islands

Rickettsial Disease

- *Notifications:* 1 notification in the quarter (2005, 0); 7 notifications over the last 12 months (2005, 1) giving a rate of 0.2 cases per 100,000 population (2005, 0.0); statistically significant increase
- *Comments:* the case was in Western Australia during the incubation period

3. Other Surveillance Reports

2005 antimicrobial resistance data from hospital and community laboratories

Each year ESR collects antimicrobial resistance data from hospital and community diagnostic laboratories throughout New Zealand. The data are derived from the results of the laboratories' routine antimicrobial susceptibility testing. Thirty-four laboratories were able to provide their 2005 resistance data. The data are collated and analysed to provide estimates of national rates of resistance. The 2005 rates are published in full on the ESR surveillance website at www.surv.esr.cri.nz/PDF_surveillance/Antimicrobial/National_AR_2005.pdf. In addition, trends in antimicrobial resistance in the five years up to and including 2005 have been analysed and are available in a report at www.surv.esr.cri.nz/PDF_surveillance/Antimicrobial/AR_Trends_2005.pdf.

Some of the key points from the 2005 data were:

(1) Rates of resistance among *Escherichia coli* from blood and urinary sources were, respectively, 3.4% and 1.7% for second-generation cephalosporins, 0.8% and 0.8% for third-generation cephalosporins, 13.8% and 7.3% for co-amoxiclav, and 4.4% and 3.7% for fluoroquinolones. Resistance to trimethoprim among urinary *E. coli* was 20.4%.

(2) Methicillin resistance in *Staphylococcus aureus* appears to have stabilised with 6.9% resistance in 2005, 7.8% resistance in 2004 and 7.5% in 2003. However, there are wide geographical variations in methicillin resistance. 4.9% of *S. aureus* were resistant to fluoroquinolones, 16.6% were mupirocin resistant and 15.7% fusidic acid resistant.

(3) Vancomycin resistance among *Enterococcus faecium* and *E. faecalis* remains rare, with just four isolates (0.1%) confirmed in 2005.

(4) Rates of penicillin resistance among non-invasive *Streptococcus pneumoniae* continue to be high, with 18.5% penicillin resistance (MIC ≥2.0 mg/L) and 26.8% penicillin non-susceptibility (MIC ≥0.12 mg/L). These rates are higher than those among invasive pneumococcal isolates tested at ESR, which were 7.1% and 17.1% respectively.

(5) Ciprofloxacin and penicillin resistance among *Neisseria gonorrhoeae* is variable throughout the country. In 2005 the national rate of ciprofloxacin resistance was 16.4% and penicillin resistance was 5.2%. In 2006 the national surveillance of gonococcal resistance was enhanced and data are now collected and reported quarterly. These quarterly reports are available on the ESR surveillance website at www.surv.esr.cri.nz/antimicrobial/neisseria_gonorrhoeae.php.

(6) Fluoroquinolone and erythromycin resistance remains uncommon among *Campylobacter*, with 2.0% fluoroquinolone resistance and 1.1% erythromycin resistance reported in 2005.

Reported by Helen Heffernan, Communicable Disease Programme, ESR

Mass chlorine poisonings at a swimming pool

On 28 August 2006, Regional Public Health (RPH) received a phone call from a local college reporting that about 30 students, aged 11 years, had been swimming and were en route to hospital with irritated eyes and vomiting. They had been swimming in one of several public pools operated by a city council. Two Health Protection Officers immediately went to the pool to investigate, after requesting the manager to close the pool.

At the hospital the students, smelling strongly of chlorine, had presented with painful, red, and watering eyes, shortness of breath, and nausea (none had vomited). Five students were assessed by a doctor for breathing difficulties and two were treated with Ventolin (a short-acting bronchodilator). All students had their eyes irrigated with saline solution. All students were discharged and advised to rest and not rub their eyes, and to return the next day if they continued to have painful eyes or visual disturbances. None represented at the hospital. A teacher aide later saw her General Practitioner twice with coughing problems.

A water aerobics group had used the pool before the students, but, unlike the students, had not put their heads under water. The group apparently did not become ill.

Investigation at the pool showed that illness was due to over-chlorination of the pool water with gaseous chlorine via a manual dosing valve. The operator had worked at another pool using an automatic dosing system and did not understand the manual system. Further, examination of the records showed incorrect Free Available Chlorine (FAC) levels recorded in the early morning prior to the pool being used by the school. The staff member had made incorrect calculations. When FACs were rechecked by the pool manager with the pool water colourimeter they were higher than the maximum detectable limit of this equipment. The colourimeter also needed recalibrating.

To rectify the immediate problem, the water balance tank was opened to dilute the chlorine in the pool until it reached a safe level and the pool could be reopened. The FAC level was then raised to normal operating levels, with half hourly measurements.

As longer–term corrective actions, the council agreed to:

(1) Produce written procedures to the practical level required by operational pool staff.

(2) Retrain all pool staff.

(3) Ensure pool colourimeters are appropriately recalibrated to measure FAC accurately.

(4) Have an independent qualified person audit the revised pool water maintenance procedures.

This Service is not aware of a similar, recent, mass illness event involving excess levels of chlorine in swimming pool water. In August 2006 seven people were injured in a chlorine spill at an aquatic centre in Narellan, Australia and taken to hospital. Ambulance staff said the reported symptoms, including shortness of breath, dizziness, and nausea, were consistent with exposure to chlorine fumes but that none of the cases had come into direct contact with the chlorine.

The chlorine poisoning attended by RPH highlighted the risk to the public of a Local Authority failing to meet its obligations of providing appropriate written procedures, staff training, and calibrated equipment to guarantee pool water quality meets NZS 5826:2000.

Reported by Quentin Ruscoe, Health Protection Officer, Regional Public Health

4. Outbreak Surveillance

The following information is a summary of the outbreak trends for New Zealand, from data collected in the last quarter (October - December 2006). Comparisons are made to the previous quarter (July - September 2006), and to the same quarter in the previous year (October - December 2005). Note that the outbreak data in this section are notified to ESR by the Public Health Services.

General

- 134 outbreaks notified in this quarter (1210 cases)
- 80 are 'final' reports (1054 cases); 54 are 'interim' reports (156 cases) that have yet to be finalised and closed

All following data pertain to final reports only.

- 13.2 cases on average per outbreak, compared with 11.9 cases per outbreak in the previous quarter (6.7 cases per outbreak in the same quarter of last year)
- 22 hospitalisations: norovirus (17 cases), *Shigella* (3 cases), and *Salmonella* (2 cases)
- 5 deaths: gastroenteritis (3 cases), and norovirus (2 cases)

Pathogens

- 27 norovirus outbreaks (690 cases) during this quarter
- 23 'gastroenteritis' outbreaks (194 cases)
- 8 *Cryptosporidium parvum* outbreaks (47 cases)
- 6 *Giardia* outbreaks (16 cases)
- 5 *Campylobacter* outbreaks (31 cases)
- 5 *Salmonella* outbreaks (12 cases)
- 2 *Bordetella pertussis* outbreaks (11 cases)
- 2 *Clostridium perfringens* outbreaks (4 cases)
- 1 Hepatitis A outbreak (45 cases)
- 1 *Shigella* outbreak (4 cases)

continued...

...Outbreak Surveillance continued

Modes of Transmission

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

- 49 person-to-person, from (non-sexual) contact with an infected person (including droplets): 25 norovirus (657 cases), 7 gastroenteritis (157 cases), 5 *C. parvum* (13 cases), 5 *Giardia* (14 cases), 3 *Salmonella* (8 cases), 2 *B. pertussis* (11 cases), 1 Hepatitis A (45 cases), and 1 *Shigella* (4 cases)
- 18 environmental, from contact with an environmental source (e.g. swimming): 15 norovirus (406 cases), and 3 *C. parvum* (32 cases)
- 17 foodborne, from consumption of contaminated food or drink (excluding water): 7 gastroenteritis (17 cases), 3 *Campylobacter* (6 cases), 3 norovirus (24 cases), 2 *C. perfringens* (4 cases), and 2 *Salmonella* (4 cases)
- 4 waterborne, from consumption of contaminated drinking water: 3 *C. parvum* (9 cases), and 1 *Giardia* (2 cases)
- 2 zoonotic: *C. parvum* (30 cases)
- 6 other mode of transmission: 4 norovirus (via formites, room cleaning) (129 cases), and 2 gastroenteritis (via formites) (71 cases)
- 17 mode of transmission unknown: 12 gastroenteritis (29 cases), 2 *Campylobacter* (25 cases), 1 *Giardia* (2 cases), 1 norovirus (28 cases), and 1 *Salmonella* (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.

- 17 home: 5 *C. parvum* (14 cases), 3 gastroenteritis (10 cases), 3 norovirus (41 cases), 2 *Salmonella* (6 cases), 1 *B. pertussis* (6 cases), 1 *C. perfringens* (2 cases), 1 Hepatitis A (45 cases), and 1 *Shigella* (4 cases)
- 17 rest home: 14 norovirus (503 cases), and 3 gastroenteritis (146 cases)
- 8 café: 3 gastroenteritis (10 cases), 3 norovirus (22 cases), 1 *Campylobacter* (2 cases), and 1 *C. perfringens* (2 cases)
- 5 hospital (continuing care): 4 norovirus (172 cases), and 1 gastroenteritis (39 cases)
- 3 takeaways: 2 gastroenteritis (4 cases), and 1 norovirus (5 cases)
- 2 camp: *Campylobacter* (22 cases) and norovirus (28 cases)
- 2 hotel/motel: norovirus (41 cases)
- 2 school: *B. pertussis* (6 cases), and norovirus (28 cases)
- 2 swimming/spa pool: *C. parvum* (5 cases)
- 1 farm: *C. parvum* (3 cases)
- 1 workplace: norovirus (31 cases)
- 1 other food: *C. perfringens* (2 cases)
- 8'other setting': 4 norovirus (72 cases) (2 bus tours, cruise vessel, respite care), 1 *B. pertussis* (5 cases) (university), 1 *C. parvum* (27 cases) (university), 1 Hepatitis A (45 cases) (overseas – Vanuatu), and 1 *Salmonella* (2 cases) (overseas – India)
- 28 outbreaks with no setting selected: 15 gastroenteritis (34 cases), 6 *Giardia* (16 cases), 3 *Campylobacter* (7 cases), 2 *Salmonella* (4 cases), 1 *C. parvum* (3 cases), and 1 norovirus (4 cases)

5. Outbreak Case Reports

ESBL-producing *Shigella flexneri* outbreak in Auckland

Despite the increasing prevalence of extended-spectrum ß-lactamase (ESBL)-producing organisms over the past decade, ESBL production among *Shigella* species has been rarely reported.

On 9 October 2006, LabPlus (Auckland City Hospital) notified the Auckland Regional Public Health Service (ARPHS) that an ESBL-producing *Shigella flexneri* had been isolated from a 36-year-old woman hospitalised with shigellosis (case 1; onset 25/09/06). On the same day, Middlemore Hospital notified ARPHS of a 31-year-old woman hospitalised with ESBL-producing *S. flexneri* (case 2; onset 2/10/06). Cases 1 and 2 were members of the same family (Family A).

Cases 1 and 2 were interviewed on 10 October. Both cases had cared for a child within their family who had been symptomatic prior to their illnesses (probable case, although *S. flexneri* not isolated; onset 18/09/06). No history of travel in Family A was noted, however, another family from the same ethnic community had recently returned from an overseas trip (Family B). The children of Family B had reportedly experienced a similar illness. On 11 October, Family B was interviewed. One of the children in Family B had been hospitalised with ESBL-producing *S. flexneri* the previous month (case 3; onset 11/09/06). Although this child had not travelled overseas, seven other family members had spent six weeks in Central Asia, returning on 14 August. Faecal samples were requested from close contacts of all cases (21) and were screened for enteric pathogens as well as multi-resistant Enterobacteriaceae.

Shigella was not isolated from any of the contacts. ESBL-producing *Escherichia coli* were isolated from 14 people, case 3 and 13 of the 19 contacts who provided a sample (including all seven members of Family B who had recently returned from Central Asia). *Campylobacter* was also isolated from case 3, *Salmonella* Paratyphi A was isolated from one contact, and *Salmonella* Enteritidis phage type 14b was isolated from another contact. Neither of these *Salmonella* were ESBL-producers.

The ESBL in the *S. flexneri* isolates and all of the ESBL-producing *E. coli* isolates was identified by PCR and sequencing as CTX-M-15, which is a common ESBL worldwide. Pulsed-field gel electrophoresis typing showed the three *S. flexneri* were indistinguishable. There were 10 distinct strains among the CTX-M-15-positive *E. coli*, with one strain isolated from seven people and another from two people. Some individuals were positive for more than one strain of CTX-M-15-positive *E. coli*. These data support the hypothesis that a 'promiscuous plasmid' carrying the $bla_{\text{CTX-M-15}}$ gene has spread between bacterial species and strains. In addition, CTX-M-15-positive *S. flexneri* and *E. coli* appears to have spread between members of the same and related families.

Promoting hand hygiene in health care and domestic settings, emphasising prudent antibiotic use by medical practitioners, appropriate ESBL screening and confirmatory testing by clinical laboratories, processes to notify ward staff of patients infected or colonised with ESBL-producing organisms including when transferring patients within or between hospitals, and national surveillance of ESBL-producing organisms are important containment strategies.

Reported by Vanessa Selak, Public Health Medicine Registrar, ARPHS; Jasmine Mohiuddin, Technical Officer, ARPHS; Arlo Upton, Clinical Microbiologist, Lab Plus, Auckland City Hospital; Tracy Bathgate, Laboratory Scientist Lab Plus, Auckland City Hospital; Susan Taylor, Clinical Microbiologist, Middlemore Hospital; Rosemary Woodhouse, Antibiotic Reference Laboratory, ESR; Helen Heffernan, Antibiotic Reference Laboratory, ESR; Gregory Simmons, Medical Officer of Health, ARPHS

Norovirus outbreak in New Plymouth from Korean oysters

On 2 August 2006 the Health Protection Unit of Taranaki District Health Board (TDHB) was notified of a suspected food poisoning linked to a food premises in New Plymouth. A group of six people had eaten at the premises on 30 July 2006 with two developing symptoms approximately 34 hours later. Symptoms consisted of diarrhoea, night sweats, aching joints, nausea and stomach cramps. One of the cases also had vomiting. These two people were the only ones in the group to eat the seafood platter, and had not dined anywhere else together. A faecal specimen was obtained from one of the cases by Health Protection staff in Wellington and submitted to ESR for analysis. Norovirus genogroup (G) II was later detected by RT-PCR from the specimen.

The premises was visited on 2 August 2006 by Health Protection Officers from TDHB. Discussions were held with the assistant manager and the head chef concerning the preparation of the seafood platter, which consisted of steamed fresh mussels, raw oysters, crumbed prawn cutlets, crumbed calamari, poached fish and scallops, and rice with salad. On the day concerned eight seafood platters were served to patrons of the premises, however no other reports of illness were received by either the premises or Taranaki Health Protection Unit. No staff members had reported in sick in the week prior. A HACCP–based assessment of the foods was undertaken and food samples obtained and sent to ESR for analysis. Norovirus G I and II were subsequently detected by RT-PCR from the oyster sample.

The premises had purchased the oysters frozen from a supplier in the Hawke's Bay and at the time of the interview the chef believed they were Chilean oysters. On 26 July 2006 the oysters were pre-portioned into snaplock bags and placed back into the freezer. As required, oysters were defrosted in a colander with water, placed back into the bags and placed into a chiller ready for serving. The premises did not have any of the original packaging as they had disposed of these when portioning the product out. Invoices were also unavailable, as they had been returned to the premises' parent company. Further investigation with the parent company, and the Hawke's Bay-based supplier (undertaken by health protection staff from that region), revealed the oysters were a no-brand Korean oyster sourced from a second supplier in Christchurch.
The parent company who orders the stock for the restaurant chain did not appear to have good approved supplier criteria including the minimum standards required. Our office also experienced difficulty in obtaining records from the supplier, the parent company and the premises due to a lack of systems in place in the companies. These issues have been referred to the local district council for follow-up. In addition, there appeared to be limited understanding of the risks of consuming raw Korean oysters by both the supplier, the parent company of the food premises and the food premises itself. It was also apparent that the kitchen staff who handled the oysters had not read the labels about not serving them raw.

The characteristics of the illness experienced by the two cases and the detection of Norovirus G II in the faecal specimen obtained from one case were all consistent with a norovirus infection.
The detection of Norovirus G I and II in the same batch of Korean oysters, which the cases consumed raw, provided strong evidence for the oysters being the cause of the gastroenteritis experienced by the two cases. This was also supported by the same brand of Korean oysters being implicated in a large outbreak investigated by Auckland Regional Public Health Service in June 2006.

Following the Auckland outbreak, Korean oysters from the wholesalers of the implicated batches had been put on hold but no consumer level recall was instigated. The New Zealand Food Safety Authority (NZFSA) had issued a Media release on 6 July 2007 warning of the dangers of consuming Korean oysters raw.
In addition on 31 July 2006, the NZFSA informed health protection units that no further permits were to be issued for the importation of Korean oysters pending review of the import health standard that includes the provisions for shellfish.

Reported by Maree Rohleder and David de Jager, Health Protection Officers, Taranaki District Health Board

6. Pathogen Surveillance

Unless otherwise reported, pathogen surveillance covers the October - December 2006 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

- 311 human and 250 non-human isolates were submitted to ERL (2005: 331 and 317 respectively)
- significant increase in the number of *S.* Typhi cases in New Zealand this quarter n=17 (2005, 2)
- cluster of 6 cases, Waikato, phage type untypable, Somalian refugees
- household cluster, 4 cases North West Auckland, phage type E1a
- cluster of 4 cases, South Auckland, phage type E1a, under extensive investigation
- remaining 3 cases: 1 laboratory acquired infection phage type E1a South Auckland, 1 phage type E7variant South Auckland, and 1 phage type E1a North West Auckland not associated with household cluster

VTEC/STEC (ERL)

- 13 laboratory confirmed human cases of *E. coli* O157:H7 (2005,15 cases)
- 2 family clusters of 2

Shigella

- 22 isolates were submitted to ESR (2005, 38)
- no outbreaks reported

Norovirus (Norovirus Reference Laboratory)

- 54 confirmed norovirus outbreaks of which 35 (65%) occurred in hospital (13) or rest home (22) settings
- several outbreaks associated with tourism settings, including a coach tour group, an incoming international flight, a cruise ship, a tourist hotel and a conference at a spa resort hotel. Two outbreaks occurred during school trips, 2 were associated with early childcare and 2 were in catered settings
- majority of noroviruses belonged to Genogroup II (42) although there were also 12 outbreaks associated with Genogroup I strains during this quarter
- predominant genotype again was GII/4, accounting for at least 15 outbreaks, including 10 outbreaks in healthcare institutions. Other genotypes occurring were GI/2, GI/5 and GI/6

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LEGIONELLOSIS AND ENVIRONMENTAL LEGIONELLA

- 12 legionellosis cases were laboratory identified with 1 death reported
- the death involved a 56 year old male from the Tairawhiti health district with a *L. pneumophila* serogroup 1 infection
- no outbreaks identified this quarter, all cases identified as sporadic CAP cases
- of the 12 cases identified, 9 fitted the confirmed case definition and 3 fitted the probable case definition
- the 9 confirmed cases were either culture-positive (4 cases) or demonstrated antibody titres >512 on two or more occasions (1 case), or at least a four-fold rise in antibody titre by the legionella IFAT (3 cases), or demonstrated antibody titres >512 on convalescent serum and was urinary antigen test positive (1 case)
- the 3 probable cases with compatible clinical symptoms demonstrated either a single antibody titre of ≥512 (1 case), or were urinary antigen positive (1 case), or PCR positive (1 case)
- *L. pneumophila* serogroup 1 was identified as the causative agent in 6 cases
- *L. pneumophila* serogroup 4 was identified in 1 case
- *L. dumoffii* was identified in 1 case
- *L. gormanii* was identified in 1 case
- *L. longbeachae* serogroup 1 was identified in 1 case
- *L. micdadei* was identified in 1 case
- *L. sainthelensi* was identified in 1 case
- environmental isolates identified this quarter included *L. pneumophila* serogroup 1 isolated from cooling tower waters, as well as showers and a water cooler. *L. sainthelensi* was isolated from a cooling tower water but this was unrelated to the clinical case involving the *L. sainthelensi* infection

RESPIRATORY VIRUSES

Influenza Virus

- 1 influenza A virus (yet to be typed) was reported from the South Canterbury region (2005, 9)

Respiratory Syncytial Virus, Rhinovirus & Parainfluenza Virus

- 28 cases of respiratory syncytial virus were reported (2005, 26)
- 5 rhinoviruses were reported (2005, 30)
- 48 parainfluenza viruses were reported (2005, 26). Among them, 43 were further typed as paparainfluenza type 3, and 5 as type 2

ADENOVIRUSES AND ENTEROVIRUSES

Adenoviruses

- 97 adenoviruses were reported (2005, 110)
- adenovirus type 4 and type 3 were the predominant serotypes
- 67 adenoviruses were serotyped as adenovirus type 1 (2), type 2 (10), type 3 (12), type 4 (16), type 5 (5), type 6 (1), type 7 (3), type 8 (9), type 11 (2), type 15 (1), and type 19 (6)

Enteroviruses

- 55 enteroviruses were reported (2005, 76)
- 21 enteroviruses were serotyped as Coxsackie B5 (2), Coxsackie A9 (7), Echovirus 3 (2), Echovirus 6 (6), Echovirus 18 (3), and Echovirus 21 (1)

SPECIAL BACTERIOLOGY

Listeria monocytogenes

- 8 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)
- 7 cases were in adults, all were elderly and/or had underlying illness, 1 case was perinatal, premature baby (24 weeks) survived
- a total of 20 isolates from separate cases were received during 2006: 2 from perinatal and 18 from non-perinatal cases

Corynebacterium diphtheriae

- 9 isolates of *Corynebacterium diphtheriae* were received for toxigenicity testing, typing and surveillance purposes
- 7 isolates were var. *mitis* strains and 2 were var. *gravis* strains, all were from cutaneous sources, patients were aged between 27 and 49 years and came from Auckland (5), Christchurch (3), and Wellington (1)
- isolates were non-toxigenic by PCR examination for the toxin gene
- a total of 29 isolates (all non-toxigenic) received during 2006: 26 from cutaneous sources, 2 from blood, and 1 from respiratory source

New Zealand Public Health Surveillance Report is produced quarterly by ESR for the Ministry of Health and may be downloaded in PDF format from www.surv.esr.cri.nz

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

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