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New Zealand Public Health Surveillance Report

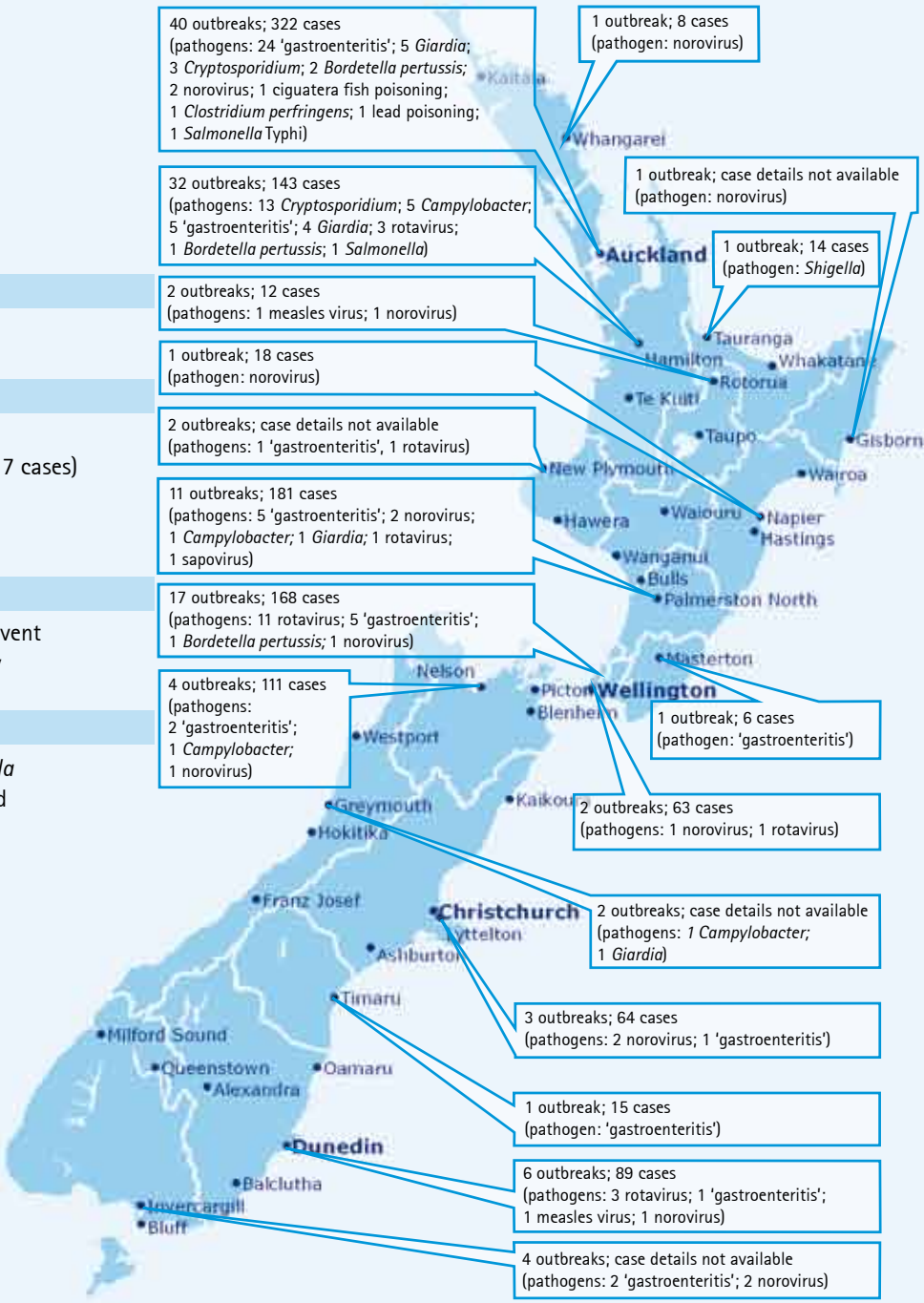
March 2012: Covering October to December 2011

Contents & Highlights

The latest reports from Sexually Transmitted Infections Surveillance, Antimicrobial Resistance, Virology and Enteric Reference Laboratories are available at www.surv.esr.cri.nz

This Quarter's Outbreaks

Notification and outbreak data in this issue are drawn from the October to December quarter of 2011. The outbreak map on this page consists of all outbreak information, final and interim. The total number of outbreaks and cases by region and outbreaks by pathogen are reported, as notified up to 11 January 2012. Outbreaks reporting exposures in more than one geographic location are assigned to the health district with the most cases. One outbreak involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to totals.



1. Editorial

Pathogen Discovery – a new technology enables the detection of unknown viruses

Virology is very much in an era of exploration in both human and animal health, and especially at the interface of these two fields. In the context of the growth of new techniques in molecular biology, a greater global awareness of emergent viral diseases such as SARS and influenza A/H5N1, and the recognition of the inter-relatedness of human and animal health (integral to the "One World, One Health" concept http://www.onehealthinitiative.com/), there has been a surge in efforts to locate and identify new viruses. Zoonotic transmission of viruses from animals to humans is an important avenue for the emergence of new human pathogens.

A robust and proven method for the discovery of new viruses is the use of electron microscopy (EM), often in combination with viral culture methods. However, viruses are not necessarily abundant enough in a specimen to permit visualisation by EM, or there may not be enough information in the image to provide identification, and not all can be cultured.

Molecular methods such as the polymerase chain reaction (PCR), are also used to detect specific viruses. Most clinicians will be familiar with the various PCR tests available to identify common human viral pathogens such as influenza, measles and hepatitis C. An adaptation of the PCR method, called consensus PCR, broadly screens samples to detect certain virus families, for example, the herpesvirus family. However, when there is no prior knowledge or evidence to guide specific testing for diagnosis, an unbiased molecular test is required. Such a test is now available, and is called next-generation sequencing (NGS or deep sequencing), that generates unbiased sequence data on DNA (or RNA) sequences contained within a sample.

NGS was used in pioneering research in 2008 to identify a novel arenavirus in fatal kidney transplant cases in Australia.[1] This work produced 103,632 sequence reads from the patient's specimens. Each sequence read was compared with public databases that hold all known sequence information for all known organisms. The vast majority of the reads were from the host (usually the conserved genetic elements such as 28S ribosomal RNA), but 14 reads were identified as being distantly related to arenaviruses. Further study confirmed that it was a new virus. NGS had identified the agent that had caused death in the transplant recipients, where other techniques had failed to do so.

Since 2008, many studies have reported new viruses in humans and animals using NGS.[2] The number of sequence reads that can be produced by NGS platforms has increased exponentially, and it is now possible to obtain over 150 million reads, with benefits for sensitivity when working with low concentrations of viruses. Furthermore, a variety of commercial NGS platforms are available, and many are now housed within university, government and hospital laboratories in New Zealand.

Funding from the Ministry of Science and Innovation's Capability Fund has enabled ESR to establish 'pathogen discovery' capability, based at the National Centre for Biosecurity and Infectious Disease, Wallaceville. This project has been in operation since 2009, and was initially supported with training from the original author of the arenavirus research, Professor Ian Lipkin from Columbia University, New York. So far, a variety of sample types have been tested by ESR for the presence of novel viruses. This work has relied upon collaboration with Dr Jo-Ann Stanton's sequencing laboratory at the Anatomy and Structural Biology Department, University of Otago.

The pathogen discovery platform at ESR has identified and sequenced a novel enterovirus, Enterovirus 68, that was received by ESR's Clinical Virology Laboratory as part of its reference work. Before 2008, only 26 cases of this virus had been recognised in the previous 30 years, worldwide. Not only did NGS assist in the identification of this rare and unexpected virus, but it also generated the entire genome sequence. A number of other clusters of Enterovirus 68 cases were observed around the world in 2010.[3]

Each year, approximately 20% of gastrointestinal outbreaks go unsolved in terms of the microbiological agent involved. ESR carried out a pilot study using NGS on two stool samples from unsolved outbreaks of gastrointestinal disease that occurred in New Zealand in 2009. NGS successfully identified viral sequences in the stool samples, however, they were not definitively identified as the causative agents. Funding has now been obtained from the Health Research Council in New Zealand to undertake a large-scale study in search of novel viruses in unsolved gastrointestinal disease outbreaks in New Zealand.

Other research projects using NGS include a collaborative study with ESR, led by Dr David McLean at the Centre for Public Health at Massey University, to search for viruses in aerosol samples at meatworks in New Zealand. Given that meatworkers have a higher incidence of lung cancer than the general population aerosol samples are being screened using NGS to determine what viruses may be present in the air and whether they are linked to an increased risk of malignancy. In addition, a partnership with Landcare Research on pathogen discovery is now enabling the application of NGS to diseases of unknown aetiology in New Zealand animals, and to examine their baseline health data.

The pathogen discovery research group at ESR is open to new collaborations, and has already worked with clinicians and hospital laboratories on potentially novel or rare infectious agents. Pathogen discovery using NGS remains expensive when compared with standard testing regimes, but certainly has a place in special cases of unsolved disease or outbreaks suspected of being caused by an infectious agent.

References

1. Palacios G, et al. 2008. A new arenavirus in a cluster of fatal transplant-associated diseases. The New England Journal of Medicine 358(10):991–8.
2. Lipkin WI 2010. Microbe hunting. Microbiology and Molecular Biology Reviews 74(3):363–77.
3. Centers for Disease Control and Prevention 2011. Clusters of acute respiratory illness associated with human enterovirus 68--Asia, Europe, and United States, 2008–2010. MMWR September 20, 60(38):1301–4.

Reported by Richard Hall and Matthew Peacey, Health Programme, NCBID, ESR.

2. Notifiable Disease Surveillance

The following is a summary of disease notifications for the October to December quarter of 2011 and cumulative notifications and rates calculated for a 12-month period (January to December 2011). For comparative purposes notification numbers and rates are presented in brackets for the same periods in the previous year. A robust method of constructing 95% confidence intervals is used to determine 'statistically significant differences' throughout this report unless otherwise stated [see Newcombe RG and Altman DG 2000. Proportions and their differences. In: Statistics with Confidence. BMJ Books, Bristol]. Data contained within this report are based on information recorded in EpiSurv by public health service staff up to 11 January 2012. As this information may be updated over time, these data should be regarded as provisional.

National surveillance data tables are available at www.surv.esr.cri.nz

VACCINE PREVENTABLE DISEASE

Invasive Pneumococcal Disease

- *Notifications:* 123 notifications in the quarter (2010, 97); 553 notifications over the last 12 months (2010, 535), giving a rate of 12.7 cases per 100,000 population (2010, 12.2), not a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (222 cases). Cases were aged between 20 days and 98 years, with 8 cases under the age of 2 years.

Measles

- *Notifications:* 314 notifications in the quarter (2010, 3); 601 notifications over the last 12 months (2010, 48), giving a rate of 13.8 cases per 100,000 population (2010, 1.1), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (181 cases) and from the same quarter last year (3 cases). 241 cases were laboratory confirmed.

Pertussis

- *Notifications:* 1244 notifications in the quarter (2010, 193); 2013 notifications over the last 12 months (2010, 872), giving a rate of 46.1 cases per 100,000 population (2010, 20.0), a statistically significant increase.
- *Comments:* there has been a statistically significant increase from the previous quarter (403 cases) and from the same quarter last year (193 cases).

Rubella

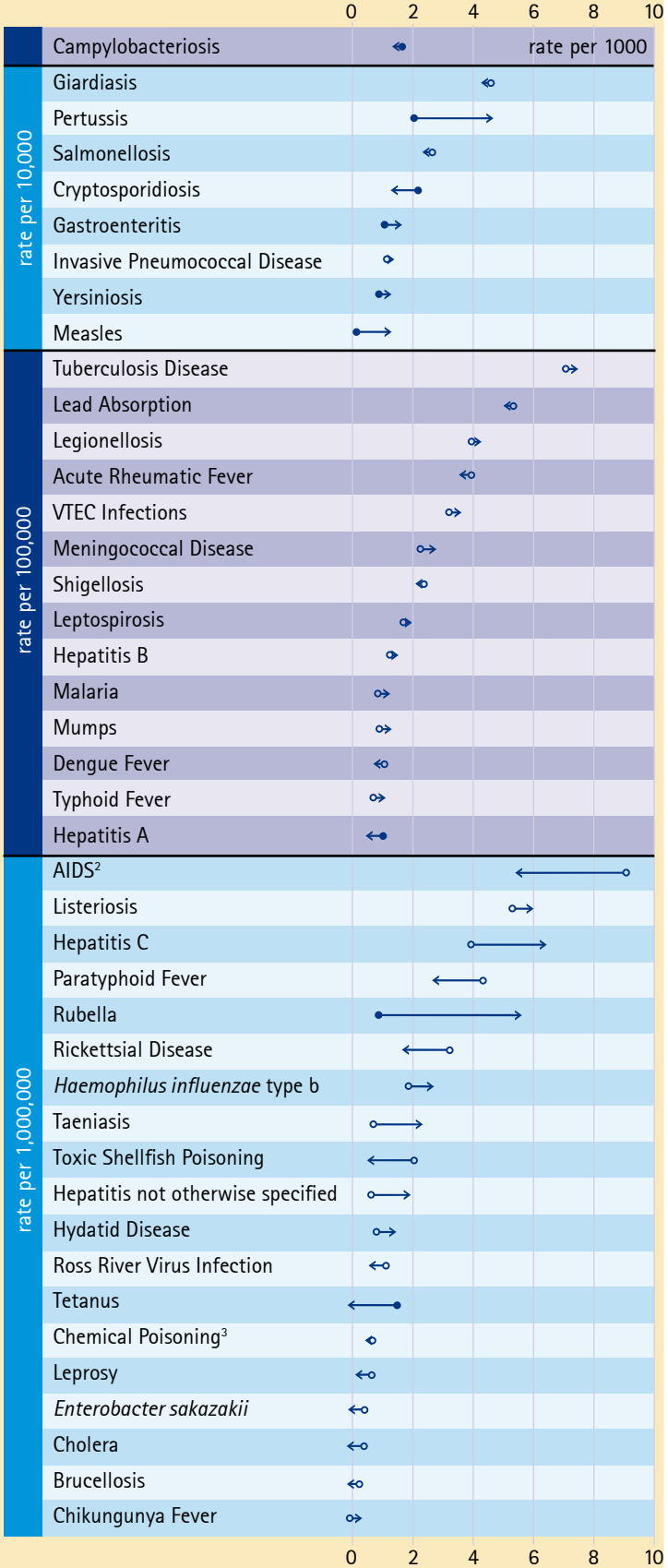
- *Notifications:* 3 notifications in the quarter (2010, 2); 24 notifications over the last 12 months (2010, 4), giving a rate of 0.5 cases per 100,000 population, a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (12 cases). 2 cases were laboratory confirmed.

Tetanus

- *Notifications:* No notifications in the quarter (2010, 3); no notifications over the last 12 months (2010, 7), a statistically significant decrease.

National Surveillance Data

12-Monthly Notification Rate Changes[1]



Notifications per 1000 or 10,000 or 100,000 or 1,000,000 population

Rate Change Symbol Key:

- > Rate increase from the previous 12-month period
- < Rate decrease from the previous 12-month period
- ● Statistically significant rate change
- ○ Statistically non-significant rate change

[1] Rates are calculated for the 12-month period January to December 2011 and compared to previous 12-month rates.

[2] Data provided by the AIDS Epidemiology Group, University of Otago. Note: changes in the 12-month notification rate should be interpreted with caution as this often reflects late notifications.

[3] From the environment.

INFECTIOUS RESPIRATORY DISEASES

Meningococcal Disease

- *Notifications:* 22 notifications in the quarter (2010, 19); 119 notifications over the last 12 months (2010, 97), giving a rate of 2.7 cases per 100,000 population (2010, 2.2), not a statistically significant increase.
- *Comments:* there has been a statistically significant decrease from the previous quarter (56 cases). Cases were distributed by age as follows:
  4 (<1 year), 6 (1–4 years), 6 (5–14 years), and 5 (15 years and over), and 1 (age unknown). 18 cases were laboratory confirmed. Of these, the strain group was identified for 16 cases: epidemic (6 cases), B non-epidemic (5 cases), and C (5 cases).

ENTERIC INFECTIONS

Campylobacteriosis

- *Notifications:* 2269 notifications in the quarter (2010, 2077); 6694 notifications over the last 12 months (2010, 7346), giving a rate of 153.3 cases per 100,000 population (2010, 168.2), a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the previous quarter (1629 cases) and from the same quarter last year (2077 cases).

Gastroenteritis

- *Notifications:* 162 notifications in the quarter (2010, 151); 632 notifications over the last 12 months (2010, 491), giving a rate of 14.5 cases per 100,000 population (2010, 11.2), a statistically significant increase.
- *Note:* this is not a notifiable disease per se except in persons with a suspected common source or with a high risk occupation. The term 'gastroenteritis' provides a catch-all category for enteric diseases that are not notifiable and for syndromic reports that come through public health units, including direct reports from the public where the causative pathogen may never be known.

Salmonellosis

- *Notifications:* 217 notifications in the quarter (2010, 296); 1061 notifications over the last 12 months (2010, 1146), giving a rate of 24.3 cases per 100,000 population (2010, 26.2), not a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly decrease from the same quarter last year (296 cases).

Yersiniosis

- *Notifications:* 124 notifications in the quarter (2010, 120); 518 notifications over the last 12 months (2010, 406) giving a rate of 11.9 per 100,000 population (2010, 9.3), a statistically significant increase.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (179 cases).

ENVIRONMENTAL EXPOSURES & INFECTIONS

Cryptosporidiosis

- *Notifications:* 235 notifications in the quarter (2010, 265); 610 notifications over the last 12 months (2010, 954), giving a rate of 14.0 cases per 100,000 population (2010, 21.8), a statistically significant decrease.

Giardiasis

- *Notifications:* 392 notifications in the quarter (2010, 419); 1935 notifications over the last 12 months (2010, 1985), giving a rate of 44.3 cases per 100,000 population (2010, 45.4), not a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly decrease from the previous quarter (462 cases).

Legionellosis

- *Notifications:* 78 notifications in the quarter (2010, 75); 182 notifications over the last 12 months (2010, 173), giving a rate of 4.2 cases per 100,000 population (2010, 4.0), not a statistically significant increase.
- *Comments:* there has been a statistically significant increase from the previous quarter (33 cases). 27 notifications from this quarter remain under investigation, a proportion of these will fail to meet the case definition and be classified as 'not a case'.

NEW, EXOTIC & IMPORTED INFECTIONS

Hepatitis A

- *Notifications:* 7 notifications in the quarter (2010, 5); 27 notifications over the last 12 months (2010, 46), giving a rate of 0.6 cases per 100,000 population (2010, 1.1), a statistically significant decrease.
- *Comments:* cases were aged between 2 and 77 years, with 3 cases under the age of 16 years. Overseas travel information was recorded for 5 cases. Of these, 2 cases had not travelled overseas during the incubation period.

Shigellosis

- *Notifications:* 28 notifications in the quarter (2010, 7); 101 notifications over the last 12 months (2010, 104), giving a rate of 2.3 cases per 100,000 population (2010, 2.4), not a statistically significant decrease.
- *Comments:* there has been a statistically significant quarterly increase from the same quarter last year (7 cases). Overseas travel or prior travel information was recorded for 14 cases. Of these, 2 cases had not travelled overseas during the incubation period and had no prior history of travel that could account for their infection.

Taeniasis

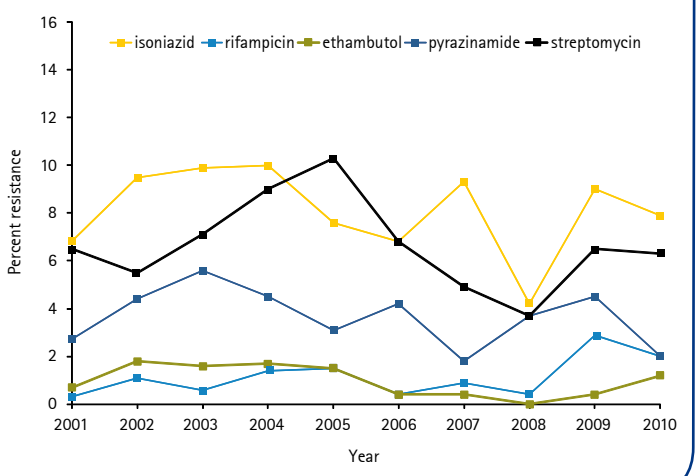
- *Notifications:* no notifications in the quarter (2010, no cases); 10 notifications over the last 12 months (2010, 3), not a statistically significant increase.
- *Comments:* there has been a statistically significant decrease from the previous quarter (5 cases).

3. Other Surveillance Reports

Antituberculosis-drug resistance, 2010

National surveillance of antituberculosis-drug resistance is based on the results of susceptibility testing of isolates in the Mycobacteriology Reference Laboratories at Auckland City, Wellington and Waikato Hospitals. Susceptibility to five antituberculosis drugs (isoniazid, rifampicin, ethambutol, pyrazinamide and streptomycin) is routinely tested.

Figure 1. Antituberculosis-drug resistance, 2001 to 2010



In 2010, 304 cases of tuberculosis (TB) were notified, 253 (83.2%) of which were reported by the Mycobacteriology Reference Laboratories as culture positive. The 253 isolates from the culture-positive cases included 250 *Mycobacterium tuberculosis* and three *Mycobacterium bovis* isolates.

Trends in resistance to the five antimicrobials are shown in Figure 1. Overall, during the last 10 years, 2001 to 2010, there has been no significant change ($p \leq 0.05$) in resistance to any of the five antimicrobials.

The majority (86.2%) of the isolates in 2010 were susceptible to all five antimicrobials tested. There were four cases of multidrug-resistant TB (MDR-TB, resistant to at least isoniazid and rifampicin). MDR-TB remains rare in New Zealand, with an average annual incidence among culture-positive TB cases of 1.0%, and a total of 28 cases identified during the last 10 years. One of the four cases of MDR-TB in 2010 was extensively drug-resistant (XDR-TB). XDR-TB is defined as resistance to isoniazid and rifampicin (i.e., MDR-TB) with additional resistance to any fluoroquinolone and either aminoglycosides (amikacin, kanamycin) or capreomycin. This case of XDR-TB is the first identified in New Zealand. The isolate was resistant to isoniazid, rifampicin, ethambutol, pyrazinamide, streptomycin, ofloxacin, amikacin, capreomycin and ethionamide. The patient was from south-east Asia and had been in New Zealand for approximately 3 years prior to being diagnosed with TB.

Compared with New Zealand-born cases, cases born overseas were more resistant to each of the antimicrobials routinely tested except pyrazinamide, although the differences were not significant ($p \leq 0.05$). All four MDR-TB cases, including the XDR-TB case, were born overseas.

Resistance among the different ethnic groups is shown in Table 1. Isoniazid, rifampicin, ethambutol and streptomycin resistance was most frequent among cases of Asian ethnicity, with 85.0% (17/20) of isoniazid-resistant isolates, all (5/5) rifampicin-resistant isolates, all (3/3) ethambutol-resistant isolates, and 68.8% (11/16) of streptomycin-resistant isolates being from cases of Asian ethnicity. The three pyrazinamide-resistant cases in Māori were all *M. bovis* infections. All four MDR-TB cases, including the XDR-TB case, were of Asian ethnicity.

Table 1. Antituberculosis-drug resistance by ethnicity, 2010

	Asian *n*=151		Pacific Peoples *n*=39		Māori *n*=30		European *n*=21		Other *n*=9		Total[1] *n*=253	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Fully susceptible	126	83.4	38	97.4	25	83.3	19	90.5	8	88.9	218	86.2
Resistant to:												
Isoniazid	17	11.3	0		1	3.3	0	1	1	11.1	20	7.9
Rifampicin	5	3.3	0		0		0		0		5	2.0
Ethambutol	3	2.0	0		0		0		0		3	1.2
Pyrazinamide	2	1.3	0		3	10.0	0		0		5	2.0
Streptomycin	11	7.3	1	2.6	2	6.7	2	9.5	0		16	6.3
MDR-TB[2]	4	2.7	0		0		0		0		4	1.6

[1] Ethnicity was unknown or not reported for 3 cases, one of which was isoniazid resistant

[2] MDR-TB, multidrug-resistant tuberculosis, that is, resistant to at least isoniazid and rifampicin

More information about antituberculosis-drug resistance in 2010 is published in the Tuberculosis in New Zealand Annual Report 2010 available at http://www.surv.esr.cri.nz/surveillance/AnnualTBReports.php

Reported by Helen Heffernan, Health Programme, ESR, on behalf of the Mycobacteriology Reference Laboratories.

4. Outbreak Surveillance

The following information is a summary of the outbreak trends for New Zealand from data collected in the last quarter (October to December 2011). Comparisons are made to the previous quarter (July to September 2011), and to the same quarter in the previous year (October to December 2010). Note that the outbreak data in this section are notified to ESR by the Public Health Services.

General

- 131 outbreaks notified in this quarter (1221 cases).
- 85 are 'final' reports (904 cases); 46 are 'interim' reports (317 cases) that have yet to be finalised and closed.

All data that follow relate to final reports only.

- 10.7 cases on average per outbreak, compared with 12.6 cases per outbreak in the previous quarter (8.6 cases per outbreak in the same quarter of last year).
- 12 hospitalisations: norovirus (4 cases), rotavirus (4 cases), 'gastroenteritis' (2 cases), *Cryptosporidium* (1 case), and sapovirus (1 case).
- One death: 'gastroenteritis' – no source identified.
- One outbreak involved more than one pathogen therefore individual pathogen outbreak numbers may not sum to totals.

Pathogens

- 22 'gastroenteritis' outbreaks (194 cases).
- 18 rotavirus outbreaks (270 cases).
- 16 *Cryptosporidium* outbreaks (50 cases).

- 10 *Giardia* outbreaks (34 cases).
- 9 norovirus outbreaks (160 cases).
- 5 *Campylobacter* outbreaks (18 cases).
- 1 *Bordetella pertussis* outbreak (6 cases).
- 1 *Clostridium perfringens* outbreak (132 cases)
- 1 measles virus outbreak (18 cases).
- 1 *Salmonella* outbreak (2 cases).
- 1 sapovirus outbreak (11 cases).
- 1 *Shigella* outbreak (14 cases).

Modes of Transmission

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

- 71 person-to-person, from (non-sexual) contact with an infected person (including droplets): 18 rotavirus (270 cases), 15 'gastroenteritis' (155 cases), 13 *Cryptosporidium* (35 cases), 9 *Giardia* (32 cases),7 norovirus (145 cases), 5 *Campylobacter* (18 cases), 1 *B. pertussis* (6 cases), 1 measles virus (18 cases), 1 *Salmonella* (2 cases), 1 sapovirus (11 cases), and 1 *Shigella* (14 cases).
- 22 zoonotic, from contact with infected animal: 12 *Cryptosporidium* (38 cases), 5 *Campylobacter* (18 cases), and 5 *Giardia* (14 cases).
- 15 environmental, from contact with an environmental source (e.g., swimming): 5 'gastroenteritis' (79 cases), 3 norovirus (85 cases), 3 rotavirus (53 cases), 2 *Giardia* (5 cases), 1 *Cryptosporidium* (4 cases), and 1 sapovirus (11 cases).
- 12 waterborne, from consumption of contaminated drinking water: 6 *Cryptosporidium* (17 cases), 3 *Campylobacter* (13 cases), and 3 *Giardia* (8 cases).
- 10 foodborne, from consumption of contaminated food or drink (excluding water): 5 'gastroenteritis' (21 cases), 2 *Cryptosporidium* (6 cases), 1 *C. perfringens* (132 cases), 1 *Salmonella* (2 cases), and 1 *Shigella* (14 cases).
- 6 mode of transmission unknown: 3 'gastroenteritis' (24 cases), 2 norovirus (15 cases), and 1 *Cryptosporidium* (3 cases).

Circumstances of Exposure

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

- 25 childcare centre: 14 rotavirus (241 cases), 7 'gastroenteritis' (38 cases), 2 *Cryptosporidium* (4 cases), 1 *Campylobacter* (3 cases), and 1 *Giardia* (3 cases).
- 25 home: 9 *Cryptosporidium* (23 cases), 8 *Giardia* (29 cases), 3 *Campylobacter* (13 cases), 2 rotavirus (43 cases), 1 *B. pertussis* (6 cases), 1 'gastroenteritis' (2 cases), and 1 *Salmonella* (2 cases).
- 15 long term care facility: 7 'gastroenteritis' (102 cases), 4 norovirus (90 cases), 3 rotavirus (24 cases), and 1 sapovirus (11 cases).
- 6 hospital (acute care): 2 'gastroenteritis' (15 cases), 2 norovirus (20 cases), 1 measles virus (18 cases), and 1 rotavirus (9 cases).
- 5 farm: 4 *Cryptosporidium* (20 cases) and 1 *Giardia* (2 cases).
- 4 restaurant/café/bakery: 2 'gastroenteritis' (4 cases), 2 norovirus (12 cases), and 1 rotavirus (5 cases).
- 1 camp: *Cryptosporidium* (10 cases).
- 1 caterers: 'gastroenteritis' (8 cases).
- 1 community, church, sports gathering: *Cryptosporidium* (2 cases).
- 1 cruise ship/airline/tour bus/train: *Shigella* (14 cases).
- 1 fast food restaurant: 'gastroenteritis' (3 cases).
- 1 hostel/boarding house: measles virus (18 cases).
- 1 other food outlet: *C. perfringens* (132 cases).
- 1 school: 'gastroenteritis' (22 cases).
- 1 supermarket/delicatessen: 'gastroenteritis' (2 cases).
- 4 'other setting': 2 *Giardia* (9 cases), 1 *C. perfringens* (132 cases), and 1 *Cryptosporidium* (2 cases).
- 14 outbreaks had two exposure settings recorded.
- 4 outbreaks had no exposure settings recorded.

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

- 2 fast food restaurant: 1 *C. perfringens* (132 cases) and 1 'gastroenteritis' (3 cases).
- 2 restaurant/café/bakery: 1 'gastroenteritis' (2 cases) and 1 *Shigella* (14 cases).
- 1 caterers: 'gastroenteritis' (8 cases).
- 1 childcare centre: *Cryptosporidium* (2 cases).
- 1 commercial food manufacturer: *Cryptosporidium* (4 cases).
- 1 community, church, sports gathering: *Cryptosporidium* (2 cases).
- 1 home: *Salmonella* (2 cases).
- 1 hospital (acute care): 'gastroenteritis' (6 cases).
- 1 outbreak had two preparation settings recorded.
- 1 outbreak had no preparation settings recorded.

5. Outbreak Case Reports

Campylobacter cases following a West Coast flood event

On 21 November 2011, Greymouth experienced a severe weather event with torrential rain that caused the water levels of the Grey River to rise to 6.2 metres. Disruptive surface flooding also occurred in the Grey Valley and surrounding townships, including Runanga.

Runanga's drinking-water supply is sourced from two unsecure bores that are surrounded by farming properties, and the supply is untreated. It supplies a population of 1600 people including the Runanga, Dunollie and Rapahoe townships. No microbiological contamination has been reported by the regular water distribution system testing programme since 2002. Plans for the treatment plant to be improved to incorporate treatment with ultraviolet irradiation have been proposed because the community has been resistant to chlorination as a standard treatment practice.

On 23 November 2011, Community & Public Health (CPH) was contacted by the Grey District Council and advised that a water sample taken from the Runanga supply after the storm was positive both for *Escherichia coli* and total coliforms. The council had already issued a boil water notice that was communicated using the internet, newspaper and radio advertising, and a leaflet drop to affected households. The council sought advice regarding further action from CPH. Temporary chlorination of the drinking-water supply was advised if the situation did not resolve rapidly. Contamination persisted, and temporary chlorination started on 1 December 2011 and remained in place at time of publication of this article. The boil water notice was lifted on 28 December 2011.

During the week of 30 November to 7 December 2011, CPH was notified of four cases of campylobacteriosis in people who had consumed water from the Runanga drinking-water supply. The cases were all contacted by phone and interviewed using standard questionnaires to determine possible links. All were New Zealand European, with an average age of 61.5 years, two were male and two female. Two cases lived in Runanga and two in Dunollie. Three cases were retired/unemployed and one was a long-haul truck driver. One case had taken 20 litres of water from his home to his batch to use as drinking-water, before the boil water notice was issued.

All of the cases reported symptom onset within 10 days of the 21 November flood event. There were no other common events or exposures for the cases, apart from consumption of water from the Runanga drinking-water supply. All of the cases were given the usual basic infection control advice. Local primary care practices were advised of the outbreak and requested to notify cases of gastroenteritis on suspicion, rather than awaiting diagnostic confirmation. No further notifications were received.

The drinking-water supply was not tested for *Campylobacter* spp. as chlorination was already in place by the time the cases were reported. While the presence of *Campylobacter* in the drinking-water supply could not be confirmed, the circumstantial evidence (microbial contamination of the water supply and timing of disease onset) suggests that the local drinking-water supply was the most likely cause of this campylobacteriosis outbreak. The council's quick response and actions appear to have stopped any further cases occurring, although it is possible that were other unreported cases of disease in people who did not go to their local general practitioner. CPH's drinking-water staff are continuing to assist the council in taking steps to improve the safety and security of this water supply.

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

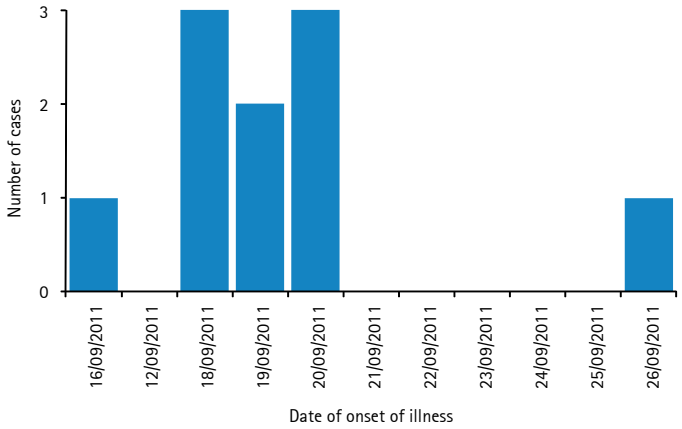
Influenza outbreak in a long-term residential facility

On 20 September 2011, Regional Public Health (RPH) was notified of a suspected influenza outbreak at a long-term residential facility in the Greater Wellington Region. The facility provides care to over 70 residents. The onset of illness in the first person suspected of having influenza infection was on 16 September 2011, and the onset of illness in the last person was on 26 September 2011. The outbreak was limited to residents and no staff members were affected.

Eighteen potential cases of influenza were reported by the facility. For analysis, the following case definitions were applied. A laboratory-confirmed case of influenza-like illness (ILI) was defined as acute onset of respiratory illness in a resident of the facility between 16 September and 26 September 2011, for whom a positive influenza swab result was obtained. A clinically-confirmed case of ILI was defined as acute onset of an elevated temperature of ≥38˚C and at least one respiratory symptom (cough, sore throat, or rhinitis) in a resident of the facility between 16 September and 26 September 2011.

Of the 18 residents initially suspected of having influenza infection, four were swabbed and each of these returned a positive polymerase chain reaction result for influenza. In addition, a further six residents had symptomatology consistent with the clinical case definition (Figure 2). For these 10 cases (laboratory- and clinically- confirmed), the average duration of illness was 9 days and the average age was 85.8 years (range 69 to 98 years).

Figure 2. Laboratory- and clinically- confirmed influenza cases by illness onset date



Influenza A H3N2 was identified in all four laboratory-confirmed cases. Of these, three were further typed as influenza A/Perth/16/2009 (H3N2). This strain was part of the influenza vaccine for 2011. Of the 10 laboratory- or clinically- confirmed cases, seven had received the influenza vaccine earlier in 2011, including three of the four laboratory-confirmed cases. The vaccination rate of staff at the facility is unknown.

Management

The decision for treatment and prophylaxis with antiviral medication resided with the attending clinician. Three of the ten cases were prescribed antibiotics for secondary respiratory infections. One death subsequent to a secondary respiratory infection occurred 2 weeks after the onset of influenza illness in a vaccinated resident who was a laboratory-confirmed case.

Recognising an outbreak was occurring, the clinical team at the facility immediately implemented a number of outbreak management procedures. Patients with suspected ILI were isolated and meals were provided in their rooms while they were infectious. Personal protective equipment, including gloves, masks, aprons and hand sanitiser, was available outside the room, for both visitors and staff. Signage advising of hand hygiene and influenza symptoms had been in place since the beginning of the influenza season.

The facility managed the outbreak efficiently and effectively. Upon notification, RPH supported the clinical team by liaising with them and their medical provider, and by advising on testing and the restriction of new admissions. Supplementary influenza outbreak resources were delivered to the facility by one of the RPH public health nurses.

Discussion

This outbreak highlights two important issues in the study and management of influenza – the role of clinical case definitions for diagnosis and management, and the efficacy of vaccination.

Influenza infection may present atypically, especially in the elderly, limiting the use of classical influenza case definitions for diagnosis. A retrospective case study of over 200 hospitalised patients with laboratory-confirmed influenza infection, found that only 51% met the Centres for Disease Control and Prevention's clinical case definition

for ILI.[1] The authors note that this may be explained by the presence of underlying medical conditions and associated medication.[1] In addition, fever is known to potentially be absent or blunted in older persons with serious infections. In this outbreak, two residents who were laboratory-confirmed cases of influenza did not meet our standard clinical case definition, as their recorded temperature did not equate to or exceed 38˚C. As such, the 10 cases identified by our analysis likely represent the minimum number of residents affected by this outbreak, and they indicate the need to consider a lower threshold for fever in the case definition of ILI, particularly for the population affected. Classical case definitions, however, may still have an important role in outbreak management. For hospitalised patients over 65 years, Walsh *et al.* contend that in a year with epidemic influenza A (H3N2), the clinical constellation of fever (≥38˚C), cough and duration of illness under 7 days, may be valuable in guiding infection control procedures.[3]

With regards to immunisation in this outbreak, seven of the ten cases had been vaccinated against the infecting strain in 2011. Vaccination is thought to reduce the severity of illness in the elderly, though a recent Cochrane review of available evidence,[4] that included randomised control trials, case-control and cohort studies of influenza immunisation for those aged over 65 years, was unable to draw conclusions about the effectiveness of the vaccine in preventing ILI, complications, hospitalisation or mortality. More research is needed in this area to inform vaccination policy.

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Reported by Tara Kessaram, Public Health Medicine Registrar and Sarah Turkington, Public Health Nurse, Regional Public Health.

From 2006 to 2010, human isolates of this new phage pattern increased in prevalence, while other phage patterns (DT 1, 156 and 160) decreased. During this period, 249 human cases of DT RDNC-May 06 were confirmed by ERL. Of the 249 cases, 138 (55.4%) cases were children aged 6 years or under. Ethnicity was recorded for 199 (79.9%) cases and was distributed as follows: European (74.4%, 148 cases), Māori (16.6%, 33 cases), Asian (5.5%, 11 cases), Pacific Peoples (2.5%, 5 cases) and Other (1.0%, 2 cases). Of the 160 (64.3%) cases for which hospitalisation status was recorded, 31 (19.4%) were hospitalised. Risk factors included: contact with food from retail premises (40.6%, 39/96 cases), contact with farm animals (31.7%, 38/120), consumed untreated water (26.9%, 25/93), contact with faecal matter (22.0%, 22/100), recreational water contact (10.8%, 11/102), contact with sick animals (9.9%, 10/101), contact with other symptomatic people (9.1%, 9/99), and travelled overseas during the incubation period (0.8%, 1/128).

From 2006 to 2010, 161 non-human isolates of DT RDNC-May 06 were confirmed. They originated from cows, birds, pigs, cats, dogs, rabbits, goats, alpaca, horses, poultry (feed and environmental), and the environment. Like the human isolates, DT RDNC-May 06 isolates from non-human sources increased in prevalence, while other phage patterns (DT 101 and 160) decreased.

Molecular typing of DT RDNC-May 06 isolates using PFGE and MLVA revealed that one dominant strain is circulating in New Zealand. This new phage pattern has spread from a single location to the entire country. It peaked at 85 human cases in 2010. Seventy-three human and 42 non-human isolates were confirmed in 2011. It has established itself as a pathogen in animals, particularly cats, cattle and horses, but has not yet been confirmed in sheep. In humans, DT RDNC-May 06 is isolated most of the year, with a peak in spring.

Reported by Muriel Dufour and Carolyn Nicol, NCBID Microbiology, Health Programme, ESR.

Mycology

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

6. Laboratory Surveillance

The emergence of a new definitive type of *Salmonella* Typhimurium in humans and animals in New Zealand

Salmonella is the second most common enteric bacterial pathogen reported in New Zealand, with a rate of 26.2 cases per 100,000 population in 2010. Surveillance of *Salmonella* in New Zealand is achieved through collaboration between the Enteric Reference laboratory (ERL) at ESR and public health units. ERL provides national reference and surveillance laboratory services for enteric bacterial pathogens isolated from human, animal, food and environmental sources. Presumptive *Salmonella* spp. are confirmed by serotyping and phage typing (for *S.* Typhimurium, *S.* Enteritidis and *S.* Typhi).

In May 2006, a new *S.* Typhimurium RDNC (reacts with phages but does not conform to a known phage pattern) phage type pattern was confirmed in New Zealand. The pattern was designated DT (Definitive Type) RDNC-May 06. The first isolate was from a 3-year-old male from Auckland with no history of overseas travel. For the next 2 years, *S.* Typhimurium DT RDNC-May 06 (DT RDNC-May 06) spread throughout the North Island. In June 2008, the first human case was confirmed in the South Island (a 2-year-old male from Canterbury). In 2010, a total of 85 human cases were confirmed (73 and 12 in the North and South Islands, respectively).

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