2015 NOTIFIABLE DISEASES AT A GLANCE

This commentary highlights findings from the *Notifiable Diseases in New Zealand Annual Report (2015)* that are noteworthy because of changes in comparison to previous years or their importance in terms of morbidity or mortality. Changes in disease notification rates are discussed with reference to changes in surveillance and diagnostic practices. Explanations for the observed changes, the policy context in which the changes are taking place and possible implications for the future are also discussed.

At a glance

In 2015, a total of 14,306 notifiable disease cases were reported through EpiSurv, New Zealand's notifiable disease database, compared with 15,045 in 2014.

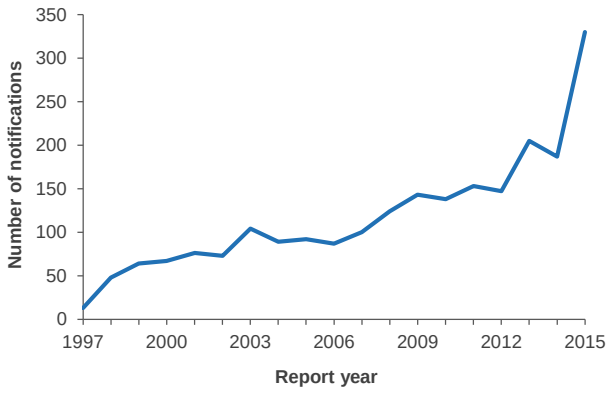
- **Increased:** cryptosporidiosis, legionellosis and VTEC/STEC infection.
- **Decreased:** campylobacteriosis, dengue fever, acute gastroenteritis, giardiasis, hepatitis A, measles and rheumatic fever.

On the increase

VTEC/STEC infection increase related to changes in laboratory testing

There was a significant increase in notified cases of VTEC/STEC infection, with 330 cases in 2015 (7.2 per 100,000 population) compared with 187 cases in 2014 (4.1 per 100,000). The increase in the annual notification rate is part of an ongoing trend, but was more marked in 2015 (see Figure 1). The introduction of screening for all faecal specimens using PCR by an Auckland laboratory in July 2015 resulted in increased VTEC/STEC detection and contributed to this change in notification rate.

Figure 1. VTEC/STEC notifications by year, 1997–2015



This change in laboratory method and processes probably accounted for the higher notification rates in 2015 seen specifically in the Northern region (Northland, Waitemata, Auckland and Counties Manukau DHBs) compared with the rest of the country. The proportion of national cases notified from the Northern region increased from 31% to 53% between 2014 and 2015.

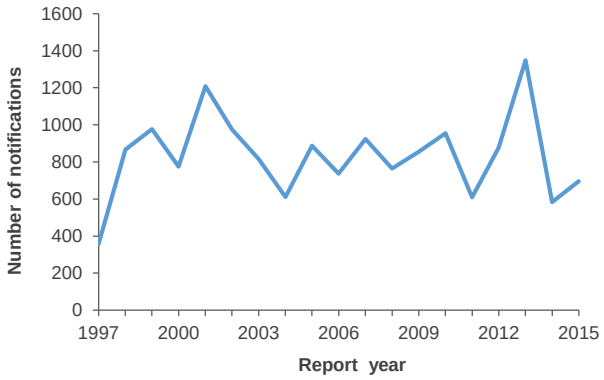
Despite the increase in notifications of VTEC/STEC infection, other measures of morbidity associated with these infections remained stable (eg, hospitalisations, Haemolytic Uraemic Syndrome (HUS) cases). This may be because the proportion of *E. coli* O157:H7 identified from VTEC/STEC isolates in 2015 was lower than in recent years, and non-O157 serotypes tend to be less pathogenic. Over 80% of VTEC/STEC isolates were confirmed by ESR in 2015; 53% were identified as *E. coli* O157:H7 and 29% as *E. coli* non-O157 serotypes. This compares with 88% *E. coli* O157:H7 and 10% *E. coli* non-O157 isolates in 2014.

As changes in laboratory testing are applied by more community laboratories throughout New Zealand, the increasing trend of less pathogenic non-O157 notifications is expected to continue. This may have implications for how notifications are managed by public health units. For example, in the Auckland region a process has been instituted to triage cases reported on the basis of PCR screening into higher and lower risk categories to determine the need for urgent public health investigation.

Cryptosporidiosis increased

There was a significant increase in notified cases of cryptosporidiosis in 2015 (696 cases, 15.1 per 100,000 population) compared with 2014 (584 cases, 12.9 per 100,000). The highest annual total for cryptosporidiosis occurred in 2013 when 1348 cases were notified, giving a rate of 30.3 per 100,000 (Figure 2).

Figure 2. Cryptosporidiosis notifications by year, 1997–2015



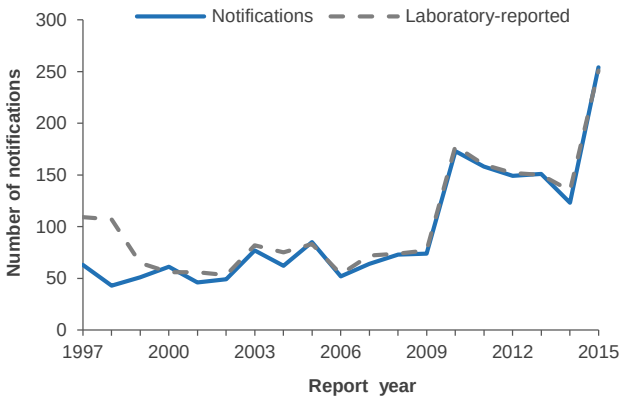
For Northland, Waitemata, Auckland and Counties Manukau DHBs, since late June 2015, all community faecal specimens with a request for bacterial pathogen screening are also screened by PCR for *Giardia* spp. and *Cryptosporidium* spp. (and not just those specimens where parasite screening was requested). Non-requested screening identified about 28% of positive cryptosporidiosis cases reported from community specimens after this change in laboratory process (personal communication Dr Arlo Upton, Labtests, Auckland). This may account for much of the 19% increase in the annual notifications in 2015 compared with 2014.

Legionellosis increased

During 2015, 254 cases of legionellosis were notified compared with 123 cases in 2014. The 2015 notification rate (5.5 per 100,000 population) was a significant increase from the 2014 rate (2.7 per 100,000). The yearly number of cases was relatively stable between 1997 and 2009, but increased in 2010 and has remained high (Figure 3).

The increase in legionellosis notifications during 2015 may be due to the LegiNZ study, which involves testing hospitalised patients with suspected pneumonia for *Legionella* spp using PCR. The study began in May 2015 and includes 20 hospitals in 17 DHBs. Although it might be expected that increased screening of patients with pneumonia would result in an increased proportion of cases due to *L. pneumophila,* this was not found. There was a small decrease in the proportion of cases due to both *L. pneumophila* and *L. longbeachae* identified in 2015 compared with 2014, and an increase from 12% to 20% of other *Legionella* spp.

Figure 3. Legionellosis notification and laboratory-reported cases by year 1997–2015

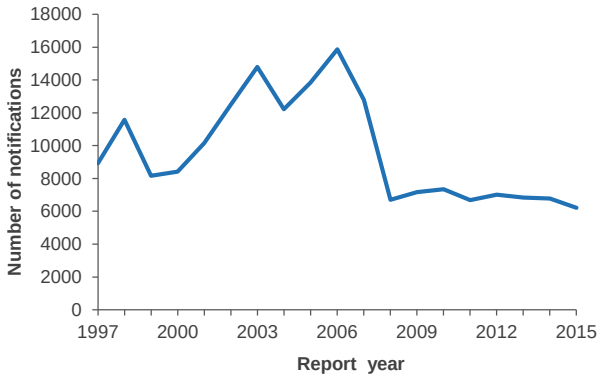


On the decrease

Campylobacteriosis continues to decrease

In 2015, 6218 cases of campylobacteriosis were notified in New Zealand. The 2015 notification rate of 135.3 per 100,000 population was significantly lower than the 2014 rate (150.4 per 100,000, 6782 cases) (Figure 4).

Figure 4. Campylobacteriosis notifications by year, 1997–2015



Between 2006 and 2008, the number of notified cases of campylobacteriosis showed a significant decrease compared with the preceding decade. The *Campylobacter* Risk Management Strategy [1] was introduced in 2006 by the then New Zealand Food Safety Authority to reduce the risk associated with poultry. The Strategy included development and implementation of microbiological surveillance activities and operational guidelines and control measures, communication between all involved parties and international collaboration.[2] An approximately 50% reduction in incidence corresponded closely in time to the introduction of voluntary and regulatory interventions and has been suggested as a causal effect.[3]

However, campylobacteriosis continues to be the most commonly notified disease, comprising 44% of all notifications in 2015. This suggests it may be useful to consider the importance of risk exposures other than poultry and possible control strategies for these pathways.

Rheumatic fever cases decrease

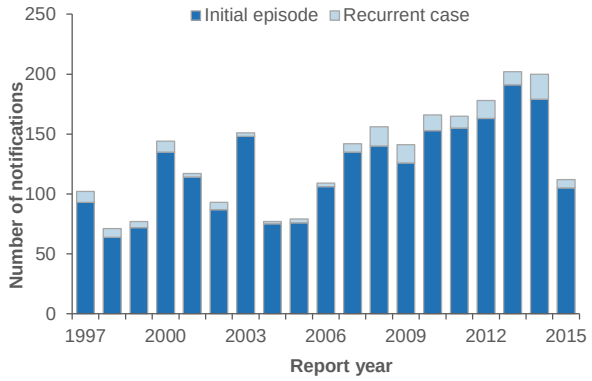
In 2015, 112 cases of rheumatic fever were notified compared with 200 cases in 2014. The 2015 notification rate (2.4 per 100,000 population) was a significant decrease from the 2014 rate (4.4 per 100,000). A total of 105 cases (2.3 per 100,000) were first episodes and seven were recurrences.

The rheumatic fever prevention program (RFPP) was established in 2011 to combat New Zealand's high rates of the disease. It includes the provision of sore throat management services through schools, primary care and pharmacies, along with raising awareness of the link between sore throats and rheumatic fever, and referral to services designed to improve housing conditions. In 2012, the government set a target to reduce the incidence of first episode rheumatic fever to 1.4 per 100,000 by 2017.

First-episode rheumatic fever hospitalisations are used for national monitoring of incidence trends, because in the past notifications did not accurately reflect disease incidence. Notifications have more closely matched hospitalisations since 2010. Notifications of first-

episode rheumatic fever increased from 2012 to 2013 and then decreased slightly in 2014 and more significantly in 2015 (Figure 5). The size and timing of the decrease in 2015 suggest that is likely to be due to the implementation of the RFPP which was only fully implemented in 2014.

Figure 5. Rheumatic fever (initial episodes and recurrent cases) by year, 1997–2015



Quality of surveillance data is improving

The quality of surveillance data obtained through Episurv has improved significantly in terms of both adherence to notification (eg, through the adoption of direct lab notification) and the completeness of key demographic data. ESR (The Institute of Environmental Science and Research) is currently leading a project to further improve EpiSurv data quality. The project aims to improve completion, timeliness and accuracy of data, with a focus on hepatitis, legionellosis, leptospirosis, arboviral diseases, rheumatic fever, tuberculosis and invasive pneumococcal disease.

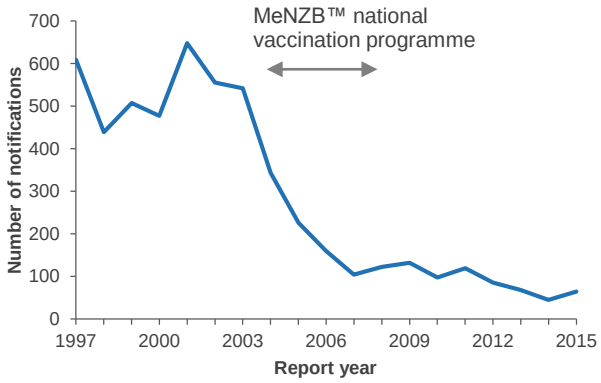
Several diagnostic improvements have also impacted on notifications in recent years. Increasing use of more sensitive molecular methods for diagnosis has resulted in increased notifications for some diseases (eg, VTEC/STEC infection) and a higher proportion of confirmed cases for other diseases (eg, pertussis, arboviral diseases). While useful in bringing more certainty to case classification, the possible influence on annual rates must be considered when interpreting trends. Gene sequencing and whole genome sequencing also increase the ability to recognise or rule out clusters of disease (eg, sequencing was used to identify a Hepatitis A outbreak in 2015).

Re-emerging issues

Meningococcal disease

In 2015, 64 cases of meningococcal disease were notified. The notification rate (1.4 per 100,000 population) was slightly higher than the 2014 rate (1.0 per 100,000, 45 cases). The rate was also a significant decrease from the peak rate (16.7 per 100,000 in 2001) observed during the New Zealand meningococcal disease epidemic (driven by the B:P1.7-2,4 strain). The 2015 rate is below the rate observed in the immediate pre-epidemic years (1989–1990).

Figure 6. Meningococcal disease notifications by year, 1997–2015



Group B strains continue to be the most prevalent, infecting 70% of laboratory-confirmed cases able to be typed in 2015. Compared with 2014, there were a higher number of group B strain cases, and these cases constituted a higher proportion of the total cases. This increase was despite the number of epidemic strain cases decreasing compared with 2014.

Table 1. Distribution of strain types among meningococcal disease cases, 2011–2015

	2011	2012	2013	2014	2015
Group B	**62**	**43**	**30**	**26**	**41**
B:P1.7-2,4	37	15	11	13	10
Other group B	25	28	19	13	31
Group C	**32**	**23**	**17**	**6**	**6**
C:P1.5-1,10-8	27	18	15	5	3
Other group C	5	5	2	1	3
Other	**6**	**2**	**10**	**4**	**12**
Group W	2	0	5	0	6
Group Y	3	2	4	3	6
Group 29E	0	0	0	1	0
Non-groupable	1	0	1	0	0
Total*	**100**	**68**	**57**	**36**	**59**

*Includes total number of laboratory-confirmed cases where strain group was determined.

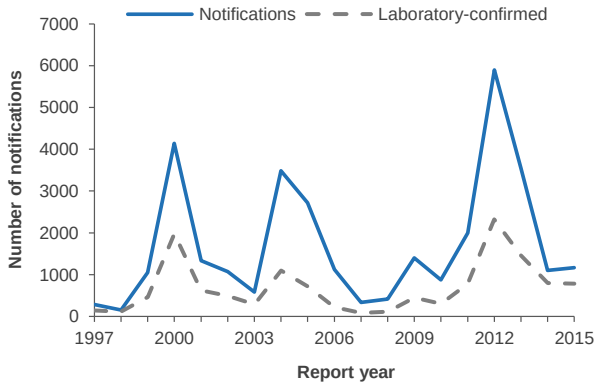
Of the 30 cases reported in children <5 years of age, almost all were able to be typed and 82% were group B strains. This is higher than the proportion of group B strains reported in in children <5 years of age in the United States in recent years (60%) but similar to the 80–86% reported in infants and toddlers in England in 2014/15.[4, 5] The rate of confirmed cases in these age groups in England is slightly lower but comparable with New Zealand at 19 per 100,000 for infants and 6 per 100,000 for toddlers.[5] A vaccine for meningococcal group B (Bexsero®) covering a broad range of group B types [6], has been approved for use in 37 countries and a routine meningococcal infant vaccination programme was started in England in September 2015.[5]

In New Zealand, meningococcal A,C,Y,W-135 conjugate and polysaccharide vaccines are recommended and available free for some high risk individuals but the meningococcal group B vaccine is not currently registered.

Pertussis

In 2015, 1168 pertussis cases were notified, of which 650 (55.7%) were laboratory-confirmed. The 2015 notification rate (25.4 per 100,000 population) was an increase from the 2014 notification rate (24.4 per 100,000, 1099 cases) (Figure 7).

Figure 7. Pertussis notifications and laboratory-confirmed cases by year, 1997–2015



There is considerable variation in both total pertussis notifications and laboratory-confirmed cases between years (Figure 7). In recent years there has been an increase in the proportion of cases that are laboratory-confirmed and in the proportion confirmed by PCR. Increased availability of PCR for identification of pertussis provides a more rapid and sensitive result than traditional culture and so may be of more value to clinicians. This may lead to a change in laboratory request behaviour and, along with the more sensitive diagnostic test, may lead to a change in the baseline notification numbers. A change in baseline may impact on the correct identification of an epidemic phase and the timing of enhanced public health messaging.

Zika virus infection

In 2015, seven cases of Zika virus infection were notified in New Zealand compared with 57 cases in 2014. The 2015 notification rate (0.2 per 100,000 population) was a significant decrease from the 2014 rate (1.3 per 100,000). Before 2014 only one case (in 2002) had been notified.

Zika virus emerged in the Pacific in 2007 in Yap (Micronesia). In 2014, circulation of Zika was present in New Caledonia, Cook Islands and Easter Island and in 2015 in Vanuatu, Solomon Islands and Fiji.[7]

Although case numbers reported in New Zealand in 2015 were low, concern arose late in the year following reports of an association between congenital cerebral malformations, including microcephaly, following an epidemic of Zika virus infection in 2013–2014.[8] A publication reporting on a case-control study of cases identified with Guillain-Barre Syndrome (GBS) during the 2013–2014 outbreak in French Polynesia provided evidence of Zika causing GBS.[9]

The WHO declared a Public Health Emergency of International Concern for Zika in February 2016, as a response to concern over its association with birth and neurological conditions. There is concern that the infection is related to clusters of microcephaly reported in Brazil in October and November 2015. An increase in cases of GBS has also been reported in Brazil and French Polynesia.[10]

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