# SURVEILLANCE REPORT

# NOTIFIABLE DISEASES IN NEW ZEALAND 2014

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Prepared as part of a Ministry of Health contract for scientific services by the Health Intelligence Team, Institute of Environmental Science and Research Limited

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# SUMMARY

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# SUMMARY

This report provides a summary of the key trends in notifiable diseases for 2014.

A total of 15,045 notifiable disease cases were reported through EpiSurv, New Zealand's notifiable disease database in 2014, compared with 17,693 in 2013.

From 2013 to 2014, notifications of most enteric diseases decreased, including a significant decrease in cases of cryptosporidiosis. Most vaccine-preventable diseases also decreased, except measles (Table 1). A significant increase in cases of yersiniosis and acute gastroenteritis, together with an increase in cases of arboviral disease (including Chikungunya, dengue and Zika fevers), occurred from 2013 to 2014.

## Enteric diseases

Notifications for most enteric diseases decreased from 2013 to 2014, except for yersiniosis and acute gastroenteritis. There was a significant increase in notified cases of yersiniosis in 2014 (682 cases, 15.1 per 100,000 population) compared with 2013 (484 cases, 10.9 per 100,000). This was also the highest yearly total since yersiniosis was made notifiable in 1996. There were seven outbreaks of *Yersinia* spp. involving 246 cases reported during 2014 (compared with three outbreaks involving 13 cases in 2013). One outbreak involving 220 cases was caused by *Yersinia pseudotuberculosis.* A significant increase in notified cases of acute gastroenteritis occurred, with 755 cases in 2014 (16.7 per 100,000) compared with 558 cases in 2013 (12.6 per 100,000).

Notified cases of cryptosporidiosis showed a significant decrease from 1348 in 2013 (30.3 per 100,000) to 584 in 2014 (12.9 per 100,000). There was no usual autumn peak in notified cases of cryptosporidiosis in 2014, although there was a spring peak. Fewer outbreaks of cryptosporidiosis were reported in 2014 (20 outbreaks, involving 60 cases), compared with 2013 (99 outbreaks, involving 550 cases). Notified cases of salmonellosis showed a significant decrease, from 1143 in 2013 (25.7 per 100,000) to 954 in 2014 (21.2 per 100,000).

Campylobacteriosis accounted for 45% of all notifications in 2014, despite a slight decrease in cases (6776 cases, 150.3 per 100,000 population) compared with 2013 (6837 cases, 153.9 per 100,000). The total number of campylobacteriosis cases for 2014 was less than half the number of cases seen during the peak in 2006 (15,873 cases).

## Vaccine-preventable diseases

Notified cases of three vaccine-preventable diseases decreased: meningococcal disease, mumps and pertussis. In particular, meningococcal disease and pertussis cases showed a significant decrease from 2013 to 2014. Only 46 cases (1.0 per 100,000 population) of meningococcal disease were notified during 2014, down from 68 cases (1.5 per 100,000) in 2013. Notified cases of pertussis showed a significant decrease, from 3540 cases (79.7 per 100,000) in 2013 to 1127 cases (25.0 per 100,000) in 2014.

A significant increase in notified cases of measles was observed, from eight cases in 2013 (0.2 per 100,000 population) to 280 cases in 2014 (6.2 per 100,000). Nineteen measles outbreaks were reported in 2014, involving 243 cases. Notified cases of invasive pneumococcal disease increased slightly, from 479 cases in 2013 (10.8 per 100,000 population) to 508 cases in 2014 (11.3 per 100,000).

## Exotic diseases

Notified cases of several arboviral diseases (Chikungunya, dengue and Zika fevers) showed a significant increase from 2013 to 2014. All of the notified cases were people who had travelled overseas during the incubation periods for the diseases.

Notified cases of dengue fever showed a significant increase in 2014 (179 cases, 4.0 per 100,000) compared with 2013 (106 cases, 2.4 per 100,000).

In 2014, 44 cases (1.0 per 100,000) of Chikungunya fever were notified compared with one case in 2013. Before 2014, only five cases had been notified - one case each year in 2007, 2008, 2009, 2011 and 2013. In 2014, 57 cases (1.3 per 100,000) of Zika fever were notified compared with no cases in 2013. Prior to 2014, only one case (in 2002) of Zika fever had been notified.

Six cases of murine typhus (a rickettsial disease) were notified in 2014. Five of these cases were assumed to have acquired their infection in New Zealand.

Four cases of leprosy were notified during 2014 compared with seven cases in 2013. The four cases were overseas during the incubation period for the disease. The countries they lived in or visited were Samoa (3 cases) and the Cook Islands (1 case).

## Table 1. Number of cases and rates per 100,000 population for selected notifiable diseases in New Zealand, 2014 and 2013

| Disease | Number of notifications | | Rate per 100,000 | | Change[d,e] |
|---|---|---|---|---|---|
| | 2014 | 2013 | 2014 | 2013 | |
| AIDS[a] | 19 | 25 | 0.4 | 0.6 | ↓ |
| Campylobacteriosis | 6776 | 6837 | 150.3 | 153.9 | ↓ |
| Cryptosporidiosis | 584 | 1348 | 12.9 | 30.3 | ↓↓ |
| Dengue fever | 179 | 106 | 4.0 | 2.4 | ↑↑ |
| Gastroenteritis (acute)[b] | 755 | 558 | 16.7 | 12.6 | ↑↑ |
| Giardiasis | 1709 | 1729 | 37.9 | 38.9 | ↓ |
| Hepatitis A | 74 | 91 | 1.6 | 2.0 | ↓ |
| Hepatitis B[c] | 35 | 28 | 0.8 | 0.6 | ↑ |
| Hepatitis C[c] | 30 | 36 | 0.7 | 0.8 | ↓ |
| Invasive pneumococcal disease | 508 | 479 | 11.3 | 10.8 | ↑ |
| Legionellosis | 125 | 151 | 2.8 | 3.4 | ↓ |
| Leptospirosis | 56 | 60 | 1.2 | 1.4 | ↓ |
| Listeriosis | 25 | 19 | 0.6 | 0.4 | ↑ |
| Malaria | 33 | 47 | 0.7 | 1.1 | ↓ |
| Measles | 280 | 8 | 6.2 | 0.2 | ↑↑ |
| Meningococcal disease | 46 | 68 | 1.0 | 1.5 | ↓↓ |
| Mumps | 19 | 23 | 0.4 | 0.5 | ↓ |
| Paratyphoid fever | 21 | 25 | 0.5 | 0.6 | ↓ |
| Pertussis | 1127 | 3540 | 25.0 | 79.7 | ↓↓ |
| Rheumatic fever[f] | 205 | 202 | 4.5 | 4.5 | NC |
| Salmonellosis | 954 | 1143 | 21.2 | 25.7 | ↓↓ |
| Shigellosis | 128 | 137 | 2.8 | 3.1 | ↓ |
| Tuberculosis disease | 305 | 275 | 6.8 | 6.2 | ↑ |
| Typhoid fever | 42 | 50 | 0.9 | 1.1 | ↓ |
| VTEC/STEC infection | 187 | 205 | 4.1 | 4.6 | ↓ |
| Yersiniosis | 682 | 484 | 15.1 | 10.9 | ↑↑ |

[a] Data source: AIDS Epidemiology Group [1]
[b] Cases of acute gastroenteritis from a common source or foodborne intoxication, eg, staphylococcal intoxication.
[c] Only acute cases of this disease are notifiable.
[d] ↓↓= significant decrease, ↑↑ = significant increase, NC = no change, ↓ = not significant decrease, ↑ = not significant increase.
[e] Fisher's exact tests were used to determine statistical significance. Results are considered statistically significant when the *P* value is less than or equal to 0.05.
[f] Includes rheumatic fever initial attack and recurrent cases.

# INTRODUCTION

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# INTRODUCTION

The *Notifiable Diseases in New Zealand: Annual Report 2014* gives an overview of the current state of notifiable diseases in New Zealand. The report includes diseases currently notifiable under the Health Act 1956 and the Tuberculosis Act 1948.

The data presented has been derived from surveillance systems operated by the Institute of Environmental Science and Research Ltd (ESR) and from other organisations in New Zealand.

Surveillance is "the ongoing systematic collection, analysis and interpretation of outcome-specific data for use in the planning, implementation and evaluation of public health practice".[2] A surveillance system "includes the functional capacity for data collection and analysis, as well as the timely dissemination of information derived from these data to enable effective prevention and control activities".[3]

Surveillance provides *information for action*. Specific objectives for disease surveillance may include the following:[4]

- to identify cases of disease that require immediate public health control measures
- to monitor disease incidence and distribution, and to alert health workers to changes in disease activity in their area
- to identify outbreaks and support their effective management
- to assess the impact of disease and help set priorities for prevention and control activities
- to identify risk factors for diseases so as to support their effective management
- to evaluate prevention and control activities
- to identify and predict emerging hazards
- to monitor changes in disease agents through laboratory testing
- to generate and evaluate hypotheses about disease aetiology
- to fulfil statutory and international reporting requirements.

Details about the individual surveillance systems are provided in the 'Surveillance methods' section of this report.

The focus of this report is on diseases reported in 2014 and (where data is available) the trends since 1997, with the aim of providing information for prevention and control measures. The report presents each notifiable disease (or disease grouping) in alphabetical order.

National data and trends over time are shown in summary tables in the Appendix. Data is also presented for specific population groups including by district health board (DHB), sex, age group and ethnic group.

In previous years, information on influenza-like illness, outbreaks and sexually transmissible diseases has also been included. These are the subject of separate annual reports and are available at www.surv.esr.cri.nz.

# SURVEILLANCE METHODS

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# SURVEILLANCE METHODS

## Interpreting data

Data in this report is presented by the date the case was reported to a public health unit (PHU) (report date) and not by the date of the onset of illness (onset date). In general, cases are allocated to geographic location based on where a medical practitioner first diagnosed them.

Notifiable disease data in this report may differ from those published in other reports depending on:

- the date of data extraction from EpiSurv
- the date used to aggregate data (eg, the date reported or date of onset of illness)
- whether laboratory-reported cases, notified cases or self-reported cases are used
- whether the case has been confirmed by laboratory tests.

The information in this report shows disease trends by age group, sex, ethnic group and location (usually a DHB).

It should be noted that various factors influence disease notification and therefore the calculation of notifiable disease rates. Where the illness is not severe, cases are less likely to consult a medical practitioner and, even if diagnosed, are less likely to be notified without laboratory confirmation.[5] Issues associated with the cost of healthcare may also determine whether people visit healthcare providers for diagnosis.[6]

The extent to which the data reflects the true incidence of a disease is affected by public awareness of the disease, access to health services, use of diagnostic facilities, case definitions (eg, broad case definitions for viral communicable diseases) and the interest, resources and priorities of local healthcare services.

This report presents the number of cases and population rates for different ethnic groups. However, caution should be exercised in the interpretation of these numbers, as ethnicity information is not always provided, different ethnic groups have different patterns of access to healthcare and the numbers may not accurately reflect the true burden of disease in the population.

For different ethnic groups, numbers and disease rates are based on a prioritised classification of ethnicity, with the Māori ethnic group at the top of the hierarchy, followed by Pacific peoples, Asian, Middle Eastern/Latin American/African (MELAA) and European or Other Ethnicity (including New Zealander).

The small New Zealand population and the low number of cases for some diseases mean that the disease rates calculated in this report may be highly variable from year to year. As such, it is necessary to interpret trends with caution. The ‘Analytical Methods’ section contains more information about the calculation of population rates for diseases.

# Data sources

The key sources of data used in this report are described below.

## EpiSurv - the national notifiable disease surveillance system

Under the Health Act 1956 and the Tuberculosis Act 1948, health professionals are required to inform their local medical officer of health of any notifiable disease that they suspect or diagnose. Since December 2007, laboratories have also been required to report notifiable diseases to medical officers of health. These notifications provide the basis for surveillance, and therefore control, of these diseases in New Zealand.

Notification data is entered at each PHU via a secure web-based portal into a database (EpiSurv). ESR collates and analyses the near real-time data on behalf of the Ministry of Health. The data collected depends on the specific disease, but usually includes demography, outcome, basis of diagnosis, risk factors and some clinical management information. Some diseases (eg, measles and yersiniosis) only became notifiable with the revised schedule of notifiable diseases that came into effect on 1 June 1996.[4] The current schedule of notifiable diseases is available at www.health.govt.nz/our-work/diseases-and-conditions/notifiable-deseases.

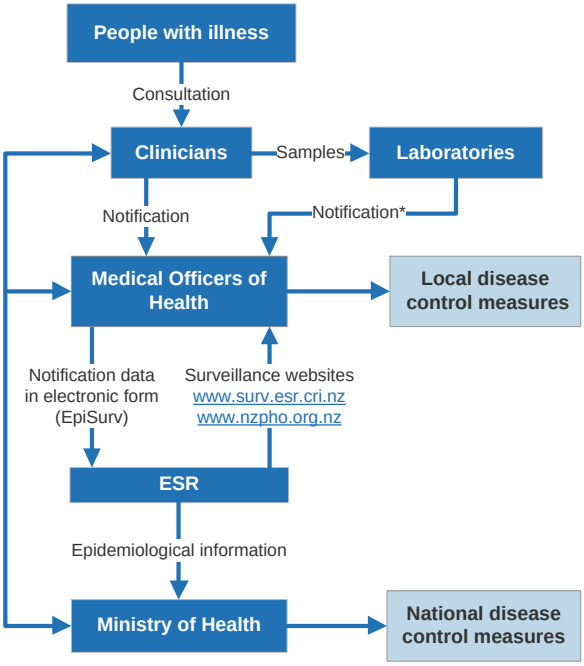
This report includes sections on all the diseases that are currently notifiable in New Zealand under the Health Act 1956 and the Tuberculosis Act 1948, excluding lead absorption, chemical poisoning from the environment and hazardous substances. During 2013 responsibility for the collection and reporting of these three conditions transferred from ESR to Massey University's Centre for Public Health Research.

Case definitions (including laboratory and clinical criteria) for notification of diseases and/or conditions are in the latest version of the Communicable Disease Control Manual (May 2012).[7]

Information on trigger points for notification of a laboratory test result are in the 'Direct Laboratory Notification of Communicable Diseases: National Guidelines'.[8]

Figure 1 illustrates the major components and information flow of the notifiable disease surveillance system.

**Figure 1. Notifiable disease surveillance system**




* From 21 December 2007

## Laboratory-based surveillance

Laboratory results for all organisms that meet the laboratory component of the notification criteria are reported directly to the medical officers of health. Laboratory reported cases may however not meet the clinical component of the case definition. For this reason the number of laboratory-reported cases may not match the number of notified cases for some diseases.

Laboratory-based surveillance may be conducted to enhance data gathered by notifiable disease surveillance. Organisms covered by laboratory-based surveillance include legionellae, *Leptospira*, meningococci, salmonellae and streptococci. For these organisms, isolates are referred to a reference laboratory for confirmation and typing. However, for some organisms, not all isolates are referred to a reference laboratory for confirmation and typing (eg, *Yersinia*).

## Statistics New Zealand

Statistics New Zealand supplies the denominator data used to calculate the population rates of disease. Further details are provided in the 'Analytical Methods' section.

## Ministry of Health

The Ministry of Health collates national data on patients admitted to and discharged from publicly funded hospitals. This data is stored as part of the National Minimum Dataset (NMDS) (see www.health.govt.nz for more information). Patients are assigned disease codes using the 10th revision of the International Classification of Diseases (ICD10) coding system.[9] Up to 99 procedure and accident diagnostic codes may be assigned for each admission. The first of these is the principal or primary diagnosis, which is the condition that was chiefly responsible for the hospital admission. This may be different from the diagnoses for the patient on admission, while in hospital, or from the final diagnosis after discharge.

Anonymised data for selected diseases was extracted from the NMDS and sent to ESR for analysis and comparison with data from other surveillance systems.

Hospital admission data presented in this report includes multiple admissions for patients with chronic notifiable diseases (eg, tuberculosis) or for diseases that have long-term health impacts (eg, meningococcal disease). For some diseases, the criteria for notification (clinical and laboratory or epidemiological evidence) do not match those required for diagnostic coding. For these reasons, hospitalisation numbers and notifications may differ.

## Surveillance of AIDS in New Zealand

Since 1989, the AIDS Epidemiology Group (AEG) at the University of Otago has been contracted to collect information about people diagnosed with AIDS through notification to medical officers of health. The use of an AIDS-specific identifier ensures that the identity of the patient is known only to the reporting doctor, but is sufficiently specific to allow detection of duplicate reports.

## New Zealand Creutzfeldt-Jakob Disease Registry

The New Zealand Creutzfeldt-Jakob disease (CJD) Registry (the Registry), at the University of Otago was established in 1996 to monitor sporadic, familial, iatrogenic and variant CJD. A medical practitioner must immediately report any suspected cases of CJD directly to the Registry as well as inform the local medical officer of health and the Director of Public Health at the Ministry of Health.[7]

## New Zealand Paediatric Surveillance Unit

The New Zealand Paediatric Surveillance Unit (NZPSU) [10] was established in 1997 to provide active surveillance of acute flaccid paralysis (AFP) to fulfil World Health Organization (WHO) requirements for the certification of polio eradication. Since then, other conditions have been added for surveillance by the NZPSU. Conditions currently under surveillance include haemolytic uraemic syndrome (HUS), congenital rubella syndrome (CRS) and perinatal exposure to human immunodeficiency virus (HIV) (see http://www.otago.ac.nz/nzpsu for a complete list).

Every month, participating paediatricians and other specialists in paediatric practice send a reply-paid card to the NZPSU on which they indicate whether they have seen any cases of the conditions under surveillance in the previous month. The average response rate to the monthly card/email is generally above 90%. The NZPSU then collates and analyses the data. Information from the NZPSU is used in this report to enhance notification data on polio, VTEC/STEC infection (HUS data) and rubella (CRS data).

# Analytical methods

Key analytical methods are provided below.

## Dates

The notification data contained in this report is based on information recorded on EpiSurv as at 23 February 2015. Changes made to EpiSurv data by PHU staff after this date are not reflected in this report. Consequently, future analyses of data may produce revised results. Notification data published in previous annual reports (from 1997 to 2013) has been updated to reflect cases in EpiSurv as at 23 February 2015.

Disease numbers are reported according to the date of notification. Laboratory results are reported according to the date the specimen was received.

## Geographic breakdown

This report provides rates for current DHB regions. The DHB populations used are shown in Table 2. These are aggregated from the Statistics New Zealand 2014 mid-year population estimates for territorial authorities in New Zealand.

**Table 2. District Health Board populations, 2014**

| DHB | Population |
|---|---|
| Northland | 166,000 |
| Waitemata | 562,600 |
| Auckland | 471,900 |
| Counties Manukau | 509,200 |
| Waikato | 383,500 |
| Lakes | 103,600 |
| Bay of Plenty | 217,400 |
| Tairawhiti | 47,100 |
| Taranaki | 115,000 |
| Hawke's Bay | 159,400 |
| Whanganui | 62,200 |
| MidCentral | 170,300 |
| Hutt Valley | 143,400 |
| Capital & Coast | 296,700 |
| Wairarapa | 42,800 |
| Nelson Marlborough | 143,100 |
| West Coast | 32,800 |
| Canterbury | 514,500 |
| South Canterbury | 58,100 |
| Southern | 309,900 |
| **Total** | **4,509,500** |

## Map classification scheme

On the maps provided in this report, the darkest colour represents the highest disease notification rates and the lightest colour represents the lowest rates. The speckled colour shows where there was insufficient data (fewer than five cases) to calculate a rate.

## Case status for notifications

All notifications recorded in EpiSurv that meet the case definitions [7], apart from cases classified as 'not a case', are included for analysis in this report. In some instances, the investigation of a case may not be complete and the status may be set to 'under investigation'. These cases are included in this report. Any changes will be reflected in future surveillance reports.

## Population rate calculations for diseases

The denominator data used to determine disease rates (except the data used to determine disease rates for ethnic groups) has been derived from the 2014 mid-year population estimates published by Statistics New Zealand. Denominator data used to determine disease rates for ethnic groups is based on the proportion of people in each ethnic group from the 2013 Census 'usually resident population' applied to the 2014 mid-year population estimates from Statistics New Zealand. Ethnicity is prioritised in the following order: Māori, Pacific peoples, Asian, MELAA, European or Other (including New Zealander) ethnic groups.

Rates are not calculated where a category has fewer than five notified cases. Calculating population rates from fewer than five cases produces unstable rates.

## Percentages

Percentages are calculated using the total number of cases for which the information was recorded as the denominator, unless specified otherwise. These percentages are usually presented with numbers in brackets that show the numerator and denominator used, eg, 49.3% (523/1061).

## Risk factors and sources of infection

For many diseases, an analysis of exposure to risk factors for the cases is reported. These risk factors are those included in the current EpiSurv case report forms. More than one risk factor is often reported for each case.

The reporting of exposure to a risk factor does not necessarily mean that this was the source of the infection.

## Vaccination data

Data on immunisation is reported for a number of vaccine-preventable diseases. This represents the vaccination status of the case as reported in EpiSurv and has not been validated against the National Immunisation Register.

## Statistical tests

Fisher's exact tests were used to determine statistical significance. Results are considered to be statistically significant when the *P* value is less than or equal to 0.05.

# LIMITATIONS OF SURVEILLANCE DATA

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# LIMITATIONS OF SURVEILLANCE DATA

## Quality

Each year a report is prepared on the quality of selected EpiSurv fields to assist in the monitoring of a quality assurance programme. The latest report was published in 2014.[11]

## Sensitivity

Sensitivity was assessed in 2003 using reporting on meningococcal disease.[12] This showed that the sensitivity of meningococcal disease surveillance is probably in excess of 87%.

A study in 2006 of hospitalised pertussis cases aged less than one year estimated under-notification to be 19%. [13]

The sensitivity of surveillance for other diseases will often be less than for meningococcal disease and pertussis, particularly for common enteric diseases where only a small proportion of those infected present to healthcare services. An acute gastrointestinal illness study conducted during 2005–2007 estimated that only 0.4% of community cases result in a notification.[14] Due to long latency periods, the system is less sensitive for the surveillance of conditions resulting from longer-term environmental exposure.

## Completeness

The completeness of data recorded in EpiSurv varies among diseases. Table 3 shows the percentage of notifications for which complete data was provided for selected EpiSurv variables from 2005 to 2014.

The completeness of date of birth, age and sex data is generally very high (>98%), with little variation over the last five years. In 2014, the completeness of date of birth, age and sex data remained high (≥99%). The completeness of ethnicity data in 2014 (94.0%) was similar to that of 2013 (94.7%).

The National Health Index (NHI) provides a unique identifier for all healthcare users and is an important link between notifiable disease, immunisation and laboratory records.

Significant progress over recent years has meant a high percentage of EpiSurv records (>94% over the last five years) now record an NHI identifier. In 2014, 96.9% of notifications had NHI recorded, a slight decrease from 97.4% in 2013. Laboratory reporting of notifiable diseases has improved the completion of NHI for notification records, but ethnicity is not provided with laboratory-reported notifications. For this reason, about 20% of notifications now have ethnicity derived from the NHI database rather than directly from the EpiSurv record.

**Table 3. Complete data for selected EpiSurv variables, 2005–2014**

| Report year | Completeness of data (%) | | | | |
|---|---|---|---|---|---|
| | Date of birth | Age | Sex | Ethnicity | NHI |
| 2005 | 98.7 | 99.0 | 98.2 | 81.6 | 64.3 |
| 2006 | 98.8 | 99.1 | 97.8 | 81.7 | 62.8 |
| 2007 | 98.7 | 99.0 | 99.2 | 79.2 | 63.9 |
| 2008 | 99.3 | 99.5 | 99.8 | 70.2 | 84.1 |
| 2009 | 99.2 | 99.3 | 98.8 | 92.1 | 91.0 |
| 2010 | 99.7 | 99.8 | 99.5 | 91.5 | 94.9 |
| 2011 | 99.6 | 99.7 | 99.0 | 94.9 | 94.3 |
| 2012 | 99.7 | 99.8 | 99.9 | 95.0 | 96.6 |
| 2013 | 99.7 | 99.8 | 100.0 | 94.7 | 97.4 |
| 2014 | 99.8 | 99.9 | 100.0 | 94.0 | 96.9 |

## Accuracy

A limitation to accuracy is the identification of cases on the basis of serology, which may not be as specific as isolating the implicated organism or detecting it using polymerase chain reaction (PCR).

## Timeliness

Timely receipt of information is essential for appropriate public health investigation and action.

Table 4 shows a summary of the timeliness of notifications by disease for 2014.

In 2014, 64.7% of disease notifications had an onset date recorded (compared with 66.5% in 2013). Of these, 45.8% were reported to a public health service (PHS) within one week of the onset of symptoms and 75.8% were reported within two weeks of the onset of symptoms.

For some diseases, reporting delays are related to the nature of the symptoms leading to late presentation (eg giardiasis, pertussis, tuberculosis disease). For other diseases there may be delays in confirmation of the diagnosis due to the particular laboratory test required (eg serology).

In 2014, 89.9% (74.8% in 2013) of the notifications were entered into EpiSurv within a day of being reported to a PHS, 98.6% were entered within one week and 99.3% were entered within two weeks.

## Table 4. Timeliness of disease reporting and data entry for notifiable diseases, 2014

| Disease | Onset date recorded (%) | Reporting delay[a] | | Entry delay[b] | | |
|---|---|---|---|---|---|---|
| | | ≤1 week | ≤2 weeks | ≤1 day | ≤1 week | ≤2 weeks |
| Campylobacteriosis | 59.9 | 57.4 | 91.1 | 91.0 | 99.3 | 99.8 |
| Chikungunya fever | 43.2 | 31.6 | 52.6 | 90.9 | 100 | 100 |
| Cryptosporidiosis | 71.2 | 38.5 | 81.7 | 90.8 | 99.7 | 99.8 |
| Dengue fever | 63.7 | 24.6 | 71.1 | 92.2 | 99.4 | 100 |
| Gastroenteritis[c] | 71.6 | 66.4 | 94.8 | 82.1 | 89.8 | 94.1 |
| Giardiasis | 50.6 | 27.7 | 52.3 | 92.1 | 98.9 | 99.8 |
| Hepatitis A | 87.8 | 47.7 | 72.3 | 93.2 | 98.6 | 100 |
| Invasive pneumococcal disease | 65.9 | 59.4 | 87.2 | 86.0 | 99.0 | 99.6 |
| Legionellosis | 84.8 | 27.4 | 55.7 | 87.2 | 99.2 | 99.2 |
| Leptospirosis | 87.5 | 16.3 | 53.1 | 75.0 | 98.2 | 98.2 |
| Measles | 97.9 | 83.6 | 95.6 | 91.8 | 99.6 | 99.6 |
| Meningococcal disease | 97.8 | 86.7 | 91.1 | 91.3 | 100 | 100 |
| Pertussis | 85.5 | 14.5 | 38.3 | 91.6 | 99.5 | 99.9 |
| Rheumatic fever - initial attack | 91.4 | 20.1 | 43.8 | 71.4 | 90.8 | 94.6 |
| Salmonellosis | 55.8 | 42.1 | 81.2 | 91.5 | 99.6 | 99.9 |
| Shigellosis | 51.6 | 28.8 | 74.2 | 97.7 | 100 | 100 |
| Tuberculosis disease | 69.6 | 6.3 | 11.2 | 91.9 | 99.0 | 99.0 |
| Typhoid fever | 45.2 | 31.6 | 73.7 | 95.2 | 100 | 100 |
| VTEC/STEC infection | 77.5 | 50.3 | 82.1 | 93.6 | 99.5 | 100 |
| Yersiniosis | 68.5 | 19.3 | 60.2 | 89.9 | 99.3 | 99.7 |
| Zika virus | 68.4 | 38.5 | 64.1 | 91.2 | 98.2 | 98.2 |
| Other | 81.1 | 72.9 | 84.4 | 75.9 | 89.9 | 93.7 |
| **Total** | **64.7** | **45.8** | **75.8** | **89.9** | **98.6** | **99.3** |

[a] Percentage of notifications reported (with onset date recorded) to a public health service within 1 week and 2 weeks of the onset of symptoms.
[b] Percentage of notifications entered into EpiSurv within 1 day, 1 week and 2 weeks of being reported to a PHS.
[c] Cases of acute gastroenteritis from a common source or foodborne intoxication, eg, staphylococcal intoxication.

# NOTIFIABLE DISEASES

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# NOTIFIABLE DISEASES

## Acquired immunodeficiency syndrome

Acquired immunodeficiency syndrome (AIDS) is a notifiable disease in New Zealand. The AIDS Epidemiology Group (AEG) within the University of Otago carries out national AIDS/HIV surveillance. More detailed information is available from the AEG website: http://dnmeds.otago.ac.nz/departments/psm/research/aids/newsletters.html.

In 2014, 19 cases of AIDS were reported to the AEG compared with 25 cases in 2013.

The 2014 AIDS notification rate (0.4 per 100,000 population) was slightly lower than the 2013 rate (0.6 per 100,000 population).

Eleven cases (57.9%) were men infected through sex with other men, seven (36.8%) were infected through heterosexual contact (4 men and 3 women), and the mode of infection was unknown for one case (5.3%).

The European ethnic group (12 cases) had the highest number of cases, followed by Māori (2 cases), Asian (2 cases), Other (2 cases), and Pacific peoples (1 case).

The cases ranged from ages 21 to 59 years, with a mean age of 44 years.

Three deaths due to AIDS were reported to the AEG as having occurred in 2014. However, the number of deaths is likely to increase due to late notifications.

## Anthrax

No cases of anthrax were notified in New Zealand in 2014. The last case was notified in 1940. New Zealand has been considered free of anthrax since the last recorded outbreak among domestic livestock in 1954.[15]

## Arboviral diseases

This section includes arboviral diseases with cases notified since 1997. Dengue fever and Yellow fever are reported in separate sections later in the report.

### Barmah Forest virus infection

No cases of Barmah Forest virus infection were notified in New Zealand in 2014. Six cases of Barmah Forest virus infection have been notified since 1997; two cases each in 2005 and 2009 and one case each in 1999 and 2004. All six cases reported travelling overseas during the incubation period for the disease.

### Chikungunya fever

In 2014, 44 cases of Chikungunya fever were notified in New Zealand compared with one case in 2013. The 2014 notification rate was 1.0 per 100,000. Before 2014 only five cases had been notified - one case each year in 2007, 2008, 2009, 2011 and 2013.

Adults in the 20–29 and 50–59 years age groups had the highest notification rates (1.5 per 100,000). Males (1.0 per 100,000) and females (0.9 per 100,000) had a similar rate.

Ethnicity was recorded for 93.2% of cases. Pacific peoples (12.3 per 100,000) had the highest notification rate, followed by the European or Other (0.2 per 100,000) ethnic group.

Hospitalisation status was recorded for 27 (61.4%) cases, of which 10 (37.0%) were hospitalised.

Of the 44 cases of Chikungunya fever, 31 (70.5%) were laboratory-confirmed.

All cases had travelled overseas during the incubation period for the disease. The countries commonly visited or lived in were Samoa (23 cases) and Tonga (14 cases). Some cases reported travel to more than one country.

The use of protective measures was recorded for eight (18.2%) cases. Protective measures reported by these cases included the use of insect repellent, bed nets, protective clothing and staying in screened or air-conditioned accommodation.

### Japanese encephalitis

No cases of Japanese encephalitis were notified in New Zealand in 2014. Since 1997, only one case of Japanese encephalitis has been notified (in 2004). The case was overseas during the incubation period for the disease.

### Ross River virus infection

One case of Ross River virus infection was notified in 2014 compared with three cases in 2013. The case was a male, in the 20–29 years age group who had been in Australia during the incubation period for the disease. The case was laboratory-confirmed.

### Zika fever

In 2014, 57 cases of Zika fever were notified in New Zealand compared with no cases in 2013. The 2014 notification rate was 1.3 per 100,000. Before 2014 only one case (in 2002) of Zika fever had been notified.

Adults aged 50–59 and 40-49 years had the highest notification rates (2.7 and 2.6 per 100,000 respectively).

Females (1.5 per 100,000) had a higher rate than males (1.0 per 100,000).

Ethnicity was recorded for 55 (96.5%) cases. Pacific peoples (2.9 per 100,000) had the highest notification rate, followed by the European or Other (1.5 per 100,000) ethnic group.

Hospitalisation status was recorded for 47 (82.5%) cases, of which four (8.5%) were hospitalised. Of the 57 cases, 35 (61.4%) were laboratory-confirmed.

All cases had travelled overseas during the incubation period for the disease. The countries

visited or lived in were the Cook Islands (53 cases), Vanuatu (2 cases), New Caledonia and Papua New Guinea (1 case each).

The use of protective measures was recorded for 16 (28.1%) cases. Protective measures reported by the cases included the use of insect repellent, bed nets, protective clothing and staying in screened or air-conditioned accommodation.

## Botulism

One probable case of botulism was reported during 2014. The case was a male aged 50–59 years who had eaten a rice snack that had not been refrigerated appropriately. He was hospitalised and received botulism anti-toxin. This is the first case of botulism reported in New Zealand since 1985 when two cases were reported.[16]

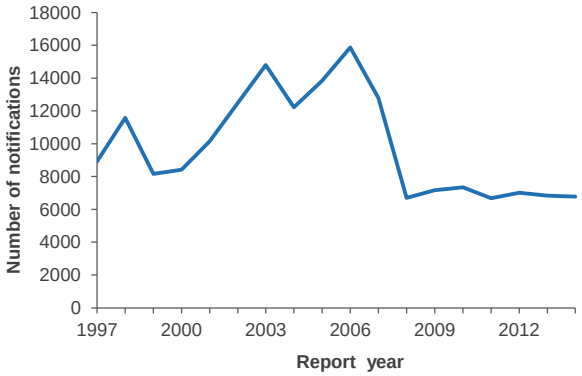
## Brucellosis

No cases of brucellosis were notified in New Zealand in 2014. Since 1997, 14 cases of brucellosis have been notified and the most recent case was notified in 2013. There has been no evidence of locally acquired brucellosis in humans since New Zealand's declaration of freedom from bovine brucellosis in 1996.[17]

## Campylobacteriosis

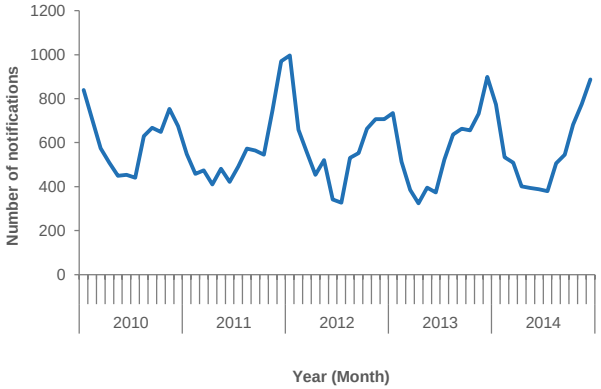
In 2014, 6776 cases of campylobacteriosis were notified in New Zealand. The 2014 rate of 150.3 per 100,000 was similar to the 2013 rate of 153.9 per 100,000 (6837 cases). Between 2006 and 2008, the number of cases reported showed a significant decrease compared with the preceding decade (Figure 2). Campylobacteriosis continues to be the most commonly notified disease, comprising 45% of all notifications in 2014.

**Figure 2. Campylobacteriosis notifications by year, 1997–2014**




The notification pattern in 2014 was similar to previous years - highly seasonal, with a summer peak and a winter trough (Figure 3). The lowest monthly campylobacteriosis total was in July 2014 (380 cases) and the highest monthly total was in December 2014 (887 cases).

**Figure 3. Campylobacteriosis notifications by month, January 2010–December 2014**




In 2014, the highest notification rates for campylobacteriosis were for people living in South Canterbury, Waikato, West Coast, Hawke's Bay and Capital & Coast DHBs (266.8, 199.2, 186.0, 184.4 and 183.0 per 100,000 respectively) (Figure 4).

**Figure 4. Campylobacteriosis notifications by DHB, 2014**

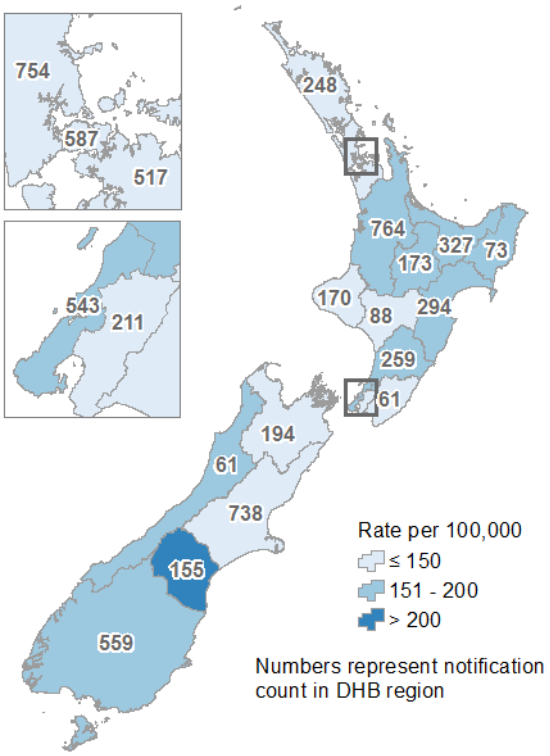


**Table 5. Exposure to risk factors associated with campylobacteriosis, 2014**

| Risk factor | Yes | No | Unknown | Percentage (%) [a] |
|---|---|---|---|---|
| Consumed food from retail premises | 1166 | 1292 | 4318 | 47.4 |
| Contact with farm animals | 1052 | 1603 | 4121 | 39.6 |
| Consumed untreated water | 556 | 1738 | 4482 | 24.2 |
| Contact with faecal matter | 488 | 1945 | 4343 | 20.1 |
| Recreational water contact | 403 | 2092 | 4281 | 16.2 |
| Contact with other symptomatic people | 275 | 2174 | 4327 | 11.2 |
| Travelled overseas during the incubation period | 230 | 2979 | 3567 | 7.2 |
| Contact with sick animals | 136 | 2175 | 4465 | 5.9 |

[a] Percentage refers to the number of cases who answered "yes" out of the total number of cases for which this information was supplied. Some cases had more than one risk factor recorded.

Children aged 1–4 years (262.1 per 100,000) and infants aged under 1 year (236.0 per 100,000) had the highest notification rates compared with other age groups.

Sex was recorded for 6771 (99.9%) cases. Males (172.8 per 100,000) had a higher rate than females (128.3 per 100,000).

Ethnicity was recorded for 6358 (93.8%) cases. The European and Other ethnic group (178.9 per 100,000) had the highest notification rate for campylobacteriosis, followed by the MELAA (86.4 per 100,000) and Māori (75.2 per 100,000) ethnic groups. Further information by DHB, sex, age and ethnic group are in Tables 31 to 35 in the Appendix.

Hospitalisation status was recorded for 4289 (63.3%) cases, of which 525 (12.2%) cases were hospitalised. No deaths due to campylobacteriosis were recorded in EpiSurv in 2014.

Consumption of food from retail (food) premises and contact with farm animals were the most common risk factors for campylobacteriosis (Table 5).

In 2014, 35 outbreaks of campylobacteriosis were reported involving 241 cases.

## Cholera

No cases of cholera were notified in New Zealand in 2014. Since 1997, a total of 12 laboratory-confirmed cases of cholera have been notified with the last case reported in 2010. The 12 people all acquired cholera while travelling overseas.

## Creutzfeldt-Jakob disease

The National Creutzfeldt-Jakob Disease (CJD) Registry is responsible for receiving notifications of suspected cases of CJD, undertaking a review of each notified case, and providing advice and reporting on CJD in New Zealand. This section is based on the 18th annual report of the Registry (1 January 2014 to 31 December 2014). [18]

In 2014, eight cases of possible sporadic CJD (sCJD) were referred to the New Zealand CJD Registry. Five cases were classified as probable sCJD and one further case tentatively classified as probable sCJD (this classification may change depending on post-mortem examination results). Two cases were classified as 'unlikely to be sCJD'.

The age distribution of the probable cases was 50–59 (1 case), 60–69 (3 cases), 70–79 (1 case) and 80–89 years (1 case). One case was male; the other five were female.

Since 1997, the Registry has documented 79 cases of sCJD, including 20 definite, 57 probable and 2 unlikely cases. This equates to a rate of 1.06 per million population per year (95% exact Poisson confidence interval (0.85, 1.32)).

No case of variant CJD, the form linked with bovine spongiform encephalopathy, has been identified in New Zealand to date.

## *Cronobacter* species invasive disease

*Cronobacter* species invasive disease (previously known as *Enterobacter sakazakii*) has been notifiable in New Zealand since mid-2005. No cases of *Cronobacter* species invasive disease were notified in New Zealand in 2014. Five cases of *Cronobacter* species invasive disease have been notified since it became notifiable.

## Cryptosporidiosis

In 2014, 584 cases of cryptosporidiosis were notified (12.9 per 100,000) in New Zealand. This was a significant decrease from the 1348 cases notified in 2013 (30.3 per 100,000) (Figure 5).

**Figure 5. Cryptosporidiosis notifications by year, 1997–2014**

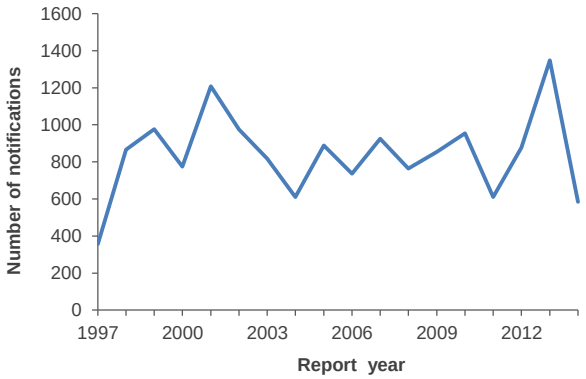
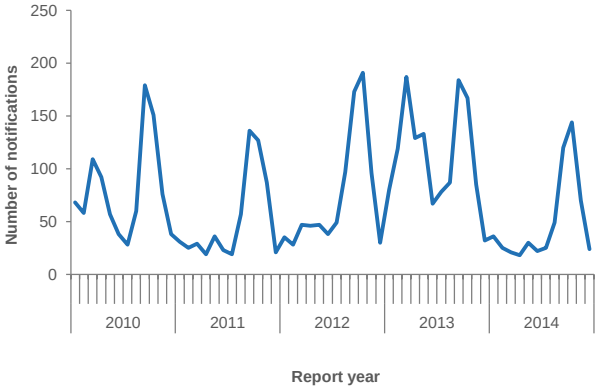


Figure 6 shows cryptosporidiosis cases by month since 2010. There is a distinct seasonal pattern, with the highest number of notifications reported during spring each year and an additional smaller peak in autumn. In 2014 there was no autumn peak, however in 2013 the autumn peak was much larger than in other years.

**Figure 6. Cryptosporidiosis notifications by month, January 2010–December 2014**




In 2014, the highest notification rates for cryptosporidiosis were reported in South Canterbury, West Coast, Wairarapa and Waikato DHBs (34.4, 27.4, 25.7 and 21.1 per 100,000 respectively) (Figure 7).

Children aged 1–4 years (67.2 per 100,000) and infants aged under 1 year (22.1 per 100,000) had the highest notification rates compared with other age groups. Nearly half (45.7%) of all cases were children aged under 15 years.

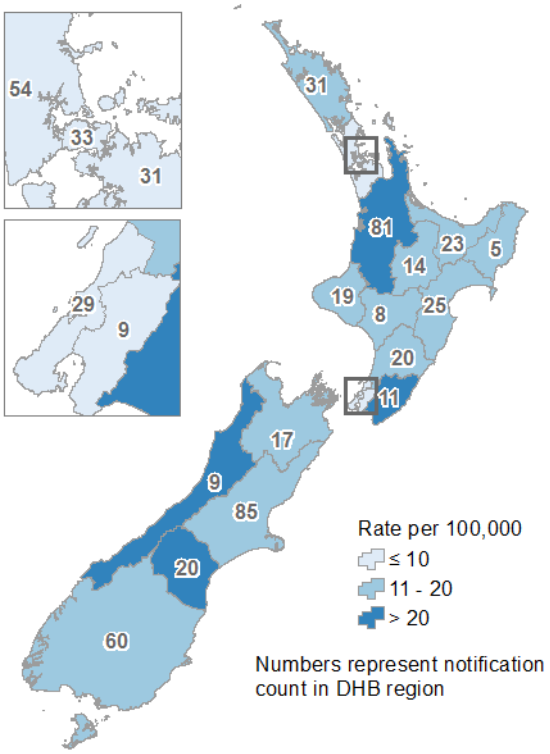
Females (13.5 per 100,000) had a slightly higher rate than males (12.4 per 100,000).

Ethnicity was recorded for 560 (95.9%) cases. The European or Other ethnic group (15.7 per 100,000) had the highest notification rate for cryptosporidiosis, followed by the Māori (8.5 per 100,000) and Pacific peoples (3.6 per 100,000) ethnic groups.

Further information by DHB, sex, age and ethnic group are in Tables 31 to 35 in the Appendix.

Hospitalisation status was recorded for 466 cases (79.8%), of which 31 (6.7%) cases were hospitalised.

**Figure 7. Cryptosporidiosis notifications by DHB, 2014**




Contact with farm animals and consumption of untreated water were the most common risk factors associated with cryptosporidiosis cases in 2014 (Table 6).

In 2014, 20 outbreaks of cryptosporidiosis were reported, involving 60 cases.

## Cysticercosis

One case of cysticercosis (*Taenia solium*) was notified in New Zealand in 2014. The case was a male in the 20–29 years age group. Probable sources identified included possible contact with pigs. Since 1997, seven cysticercosis cases have been reported - three cases in 2005, two cases in 2007, and one each in 2013 and 2014.

Ministry of Health hospitalisation data for 2014 recorded one hospitalisation with cysticercosis as the principal diagnosis.

**Table 6. Exposure to risk factors associated with cryptosporidiosis, 2014**

| Risk factor | Yes | No | Unknown | Percentage (%) [a] |
|---|---|---|---|---|
| Contact with farm animals | 207 | 154 | 223 | 57.3 |
| Consumed untreated water | 124 | 175 | 285 | 41.5 |
| Contact with faecal matter | 122 | 205 | 257 | 37.3 |
| Consumed food from retail premises | 98 | 214 | 272 | 31.4 |
| Contact with sick animals | 81 | 217 | 286 | 27.2 |
| Recreational water contact | 93 | 250 | 241 | 27.1 |
| Contact with other symptomatic people | 83 | 243 | 258 | 25.5 |
| Travelled overseas during the incubation period | 42 | 354 | 188 | 10.6 |

[a] Percentage refers to the number of cases who answered "yes" out of the total number of cases for which this information was supplied. Some cases have more than one risk factor recorded.

## Decompression sickness

No cases of decompression sickness were notified in New Zealand in 2014.

Ministry of Health hospitalisation data for 2014 recorded 22 cases with decompression sickness as the primary diagnosis.

Over the last five years the number of hospitalisations with decompression sickness as the principal diagnosis has ranged from 22 to 42 annually, compared with 0 to 2 annual notifications, indicating consistent under-notification of this condition.

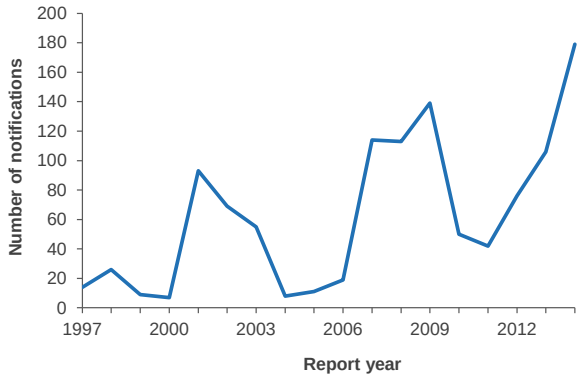
## Dengue fever

In 2014, 179 cases of dengue fever were notified in New Zealand compared with 106 cases in 2013 (Figure 8). The 2014 notification rate (4.0 per 100,000) was a significant increase from the 2013 rate (2.4 per 100,000).

Adults in the 30–39, 50–59 and 60–69 years age groups had the highest notification rates (6.7, 6.7 and 6.3 per 100,000 respectively).

Males (4.7 per 100,000) had a higher rate than females (3.3 per 100,000).

**Figure 8. Dengue fever notifications by year, 1997–2014**




Ethnicity was recorded for 155 (86.6%) cases. Pacific peoples (10.5 per 100,000) had the highest notification rate for dengue fever, followed by the Asian (7.6 per 100,000) ethnic group.

Hospitalisation status was recorded for 127 (70.9%) cases, of which 61 (48.0%) were hospitalised. Of the 179 cases, 172 (96.1%) were laboratory-confirmed.

All of the cases of dengue fever had travelled overseas during the incubation period for the disease. The countries commonly visited or lived in were Fiji (62 cases), Indonesia (26 cases), and Thailand (15 cases). Some cases reported travelling to more than one country.

The use of protective measures was recorded for 51 (28.5%) cases. Protective measures reported by these cases included the use of insect repellent, bed nets, protective clothing and staying in screened or air-conditioned accommodation.

## Diphtheria

Two confirmed cases of cutaneous toxigenic diphtheria were notified in New Zealand in 2014. One case was a male in the 20–29 years age group from Capital & Coast DHB who was in Tokelau during the incubation period for the disease. The second case was a male in the 40–49 years age group from Counties Manukau DHB. The case was of Pacific ethnicity but had an unknown travel history.

The last case of toxigenic respiratory diphtheria was reported in 1998. [19]

In 2014, the Special Bacteriology Laboratory at ESR received 32 isolates of *Corynebacterium diphtheriae* for toxin testing. The majority (26 isolates, 81.3%) were from cutaneous sources, four were from the throat, and two were from blood. Two isolates, both from cutaneous sites, were found to be toxigenic strains.

## Gastroenteritis (acute)

Gastroenteritis includes a number of communicable diseases. Not all sporadic cases of acute gastroenteritis are notifiable. Cases thought to be related to a common source, as well as those occurring in a person in a high-risk category (eg, food handler or early childcare centre worker) are notifiable on suspicion. Infections caused by norovirus, rotavirus and sapovirus, and histamine (scromboid) are included in this section (Table 7). Toxic shellfish poisoning is reported separately below. Diseases and conditions that are notifiable in their own right (eg, campylobacteriosis, giardiasis, VTEC/STEC and salmonellosis) are reported separately.

From July 2000, PHUs have also been encouraged to record all cases of acute gastroenteritis caused by non-notifiable or unknown foodborne intoxicants, including those reported by the public.

In 2014, 755 cases of acute gastroenteritis were notified in New Zealand. The 2014 rate of 16.7 per 100,000 was a significant increase compared with the 2013 rate of 12.6 per 100,000 (558 cases). A causal agent was reported for 326 cases (43.2%). Of these, the most common pathogens recorded were rotavirus (24.0%, 181 cases) and norovirus (15.2%, 115 cases).

The distribution of cases by causal agent is shown in Table 7.

**Table 7. Acute gastroenteritis cases by agent type, 2014**

| Agent type | Cases | Percentage (%) |
|---|---|---|
| **Agent identified** | **326** | **43.2** |
| Rotavirus infection | 181 | 24.0 |
| Norovirus infection | 115 | 15.2 |
| *Clostridium difficile* | 9 | 1.2 |
| Sapovirus infection | 6 | 0.8 |
| *Aeromonas* species | 3 | 0.4 |
| *Bacillus cereus* food poisoning | 3 | 0.4 |
| Ciguatera fish poisoning | 3 | 0.4 |
| Histamine (scombroid) poisoning | 2 | 0.3 |
| *Vibrio parahaemolyticus* | 2 | 0.3 |
| Staphylococcal food poisoning | 1 | 0.1 |
| Tutin food poisoning | 1 | 0.1 |
| **Agent not identified** | **429** | **56.8** |
| **Total** | **755** | **100.0** |

The highest notification rates for acute gastroenteritis were reported from MidCentral, Capital & Coast and Hutt Valley DHBs (83.4, 66.4, and 59.3 per 100,000 respectively).

Infants aged under 1 (64.5 per 100,000) and children aged 1–4 years (62.0 per 100,000) had high notification rates for acute gastroenteritis, as did adults aged 70 years and over (31.8 per 100,000).

Females (18.8 per 100,000) had a higher rate than males (14.6 per 100,000).

The European or Other ethnic group (18.0 per 100,000) had high notification rates for gastroenteritis compared with the Asian (11.0 per 100,000), Māori (8.3 per 100,000) and Pacific peoples (6.8 per 100,000) ethnic groups.

Hospitalisation status was recorded for 544 (72.1%) cases. Of these, 30 cases (5.5%) were hospitalised. Two deaths were reported from gastroenteritis.

The risk factors recorded for acute gastroenteritis cases are shown in Table 8. The most common risk factor associated with gastroenteritis was consumption of food from retail premises.

In 2014, 243 outbreaks of acute gastroenteritis were reported involving 2898 cases, of which 183 cases were also included as individual case notifications.

### Toxic shellfish poisoning

In 2014, 18 cases of toxic shellfish poisoning were notified (a rate of 0.4 per 100,000), compared with one case in 2013. Sixteen cases were reported with paralytic shellfish poisoning and the poisoning type was unspecified for two cases.

Age, sex and ethnicity were recorded for all cases.

Ages ranged from 5 to 85 years, with the highest number of cases in the 30–39 years age group (5 cases). There were 12 males and six females. The majority of cases were from Bay of Plenty DHB (10 cases). The cases notified in 2014 were in the European or Other (10 cases) and Māori (8 cases) ethnic groups.

Hospitalisation status was recorded for all cases and 11 cases (61.1%) were hospitalised.

All 18 cases had eaten recreationally collected seafood.

One outbreak involving 13 cases was reported in 2014.

**Table 8. Exposure to risk factors associated with acute gastroenteritis, 2014**

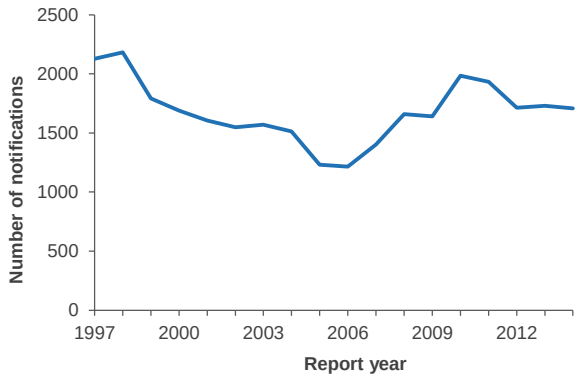
| Risk factor | Yes | No | Unknown | Percentage (%) [a] |
|---|---|---|---|---|
| Consumed food from retail premises | 280 | 43 | 432 | 86.7 |
| Contact with other symptomatic people | 118 | 240 | 397 | 33.0 |
| Contact with faecal matter | 31 | 263 | 461 | 10.5 |
| Contact with farm animals | 25 | 273 | 457 | 8.4 |
| Consumed untreated water | 22 | 267 | 466 | 7.6 |
| Recreational water contact | 20 | 269 | 466 | 6.9 |
| Travelled overseas during the incubation period | 9 | 317 | 429 | 2.8 |
| Contact with sick animals | 2 | 290 | 463 | 0.7 |

[a] Percentage refers to the number of cases who answered "yes" out of the total number of cases for which this information was supplied. Some cases had more than one risk factor recorded.

## Giardiasis

In 2014, 1709 cases of giardiasis were notified in New Zealand. The notification rate (37.9 per 100,000) was similar to the 2013 rate (38.9 per 100,000). Figure 9 shows giardiasis notifications by year from 1997 to 2014.

**Figure 9. Giardiasis notifications by year, 1997–2014**




In 2014, the highest notification rates for giardiasis were reported from Lakes, Hawke's Bay, Tairawhiti, and Wairarapa DHBs (74.3, 57.1, 51.0 and 49.1 per 100,000, respectively) (Figure 10).

Children aged 1–4 years (140.8 per 100,000) and adults aged 30–39 years (66.8 per 100,000) had high notification rates for giardiasis compared with other age groups.

Males had a slightly higher rate of giardiasis than females (39.6 and 36.2 per 100,000 respectively).

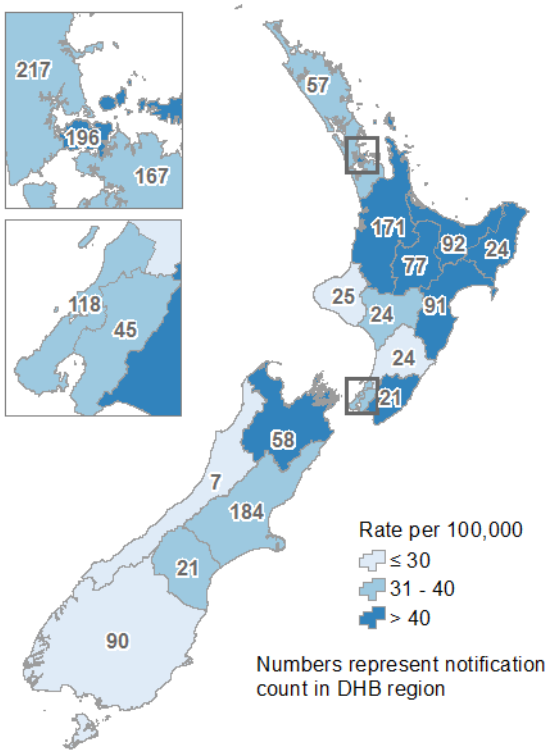
Ethnicity was recorded for 1574 (92.1%) cases of giardiasis. The MELAA ethnic group (92.4 per 100,000) had the highest notification rate for giardiasis, followed by the European or Other ethnic group (43.4 per 100,000).

Hospitalisation status was recorded for 1060 (62.0%) cases, of which 41 (3.9%) were hospitalised.

The most commonly reported risk factors for giardiasis were contact with faecal matter and contact with other symptomatic people (Table 9).

In 2014, 85 giardiasis outbreaks were reported involving 317 cases.

**Figure 10. Giardiasis notifications by DHB, 2014**




## *Haemophilus influenzae* serotype b disease

Five cases of *Haemophilus influenzae* serotype b (Hib) disease were notified in New Zealand in 2014. Two cases were laboratory-confirmed. One case was aged under 5 years, compared with none, one, three and five cases aged under 5 reported in 2013, 2012, 2011 and 2010 respectively. This case was a male, of European or Other ethnicity, and was not vaccinated.

A Hib vaccine was introduced in January 1994. The current immunisation schedule recommends a primary course of three doses of DTaP-IPV-HepB/Hib vaccine for infants when aged six weeks, three months and five months, and a booster of Hib vaccine when aged 15 months.[20]

**Table 9. Exposure to risk factors associated with giardiasis, 2014**

| Risk factor | Yes | No | Unknown | Percentage (%) [a] |
|---|---|---|---|---|
| Contact with faecal matter | 315 | 429 | 965 | 42.3 |
| Contact with other symptomatic people | 301 | 450 | 958 | 40.1 |
| Recreational water contact | 281 | 466 | 962 | 37.6 |
| Consumed food from retail premises | 226 | 438 | 1045 | 34.0 |
| Consumed untreated water | 236 | 473 | 1000 | 33.3 |
| Contact with farm animals | 228 | 546 | 935 | 29.5 |
| Travelled overseas during the incubation period | 167 | 699 | 843 | 19.3 |
| Contact with sick animals | 22 | 705 | 982 | 3.0 |

[a] Percentage refers to the number of cases that answered "yes" out of the total number of cases for which this information was supplied. Some cases had more than one risk factor recorded

## Hepatitis A

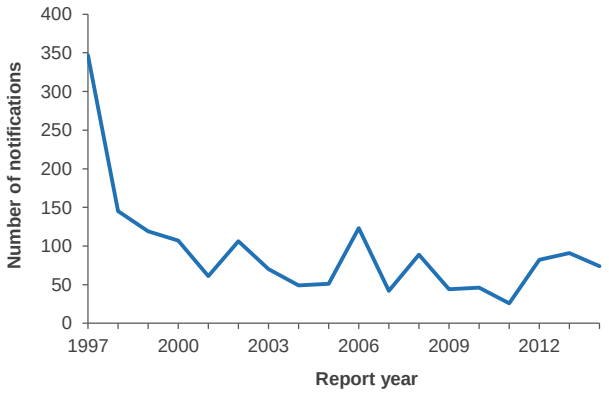
In 2014, 74 cases of hepatitis A were notified in New Zealand, compared with 91 notifications in 2013. Since 2001, numbers show some fluctuation, primarily due to outbreaks in 2002, 2006, 2008, 2012 and 2013 (Figure 11). The 2014 notification rate (1.6 per 100,000) was a slight decrease from the 2013 rate (2.0 per 100,000).

Hutt Valley (6.3 per 100,000), Counties Manukau (3.5 per 100,000) and Northland DHBs (3.0 per 100,000) had the highest notification rates.

Children aged 5–9 years (2.9 per 100,000) had the highest rates, followed by adults aged 20–29 years (2.6 per 100,000) and young people aged 15–19 years (2.2 per 100,000).

Males (1.6 per 100,000) and females (1.7 per 100,000) had similar rates.

**Figure 11. Hepatitis A notifications by year, 1997–2014**




Ethnicity was recorded for 71 (95.9%) cases. Pacific peoples (9.7 per 100,000) had the highest notification rate for hepatitis A, followed by the Asian ethnic group (3.9 per 100,000).

Hospitalisation status was recorded for 63 (85.1%) cases, of which, 24 (38.1%) were hospitalised.

Travel information was recorded for 71 cases (95.9%). Of those, 46 cases (64.8%) had travelled overseas during the incubation period for the disease. The countries most commonly visited were Fiji (20 cases), Samoa (9 cases) and India (6 cases). Eight cases reported travelling to more than one country.

In 2014, one outbreak of hepatitis A was reported involving six cases.

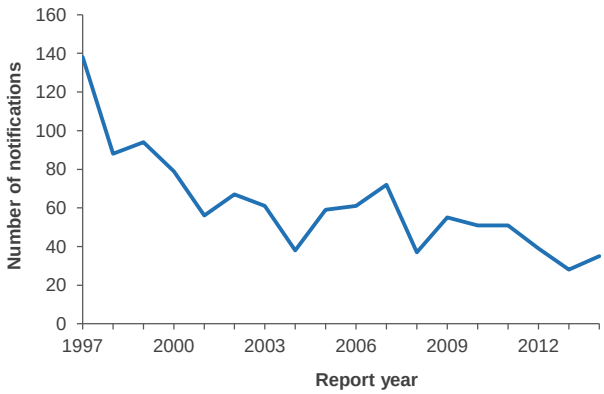
## Hepatitis B

In New Zealand, only acute hepatitis B is a notifiable disease, so notification rates do not give an indication of the burden of chronic hepatitis B infection.

In 2014, 35 cases of hepatitis B were notified compared with 28 cases in 2013 (Figure 12). The number of hepatitis B cases has ranged from 28 to 51 in the last five years.

There has been a decrease in the number of hepatitis B cases since 1984 when over 600 cases were notified. This decrease is primarily due to the introduction of universal childhood immunisation for hepatitis B in 1988.[20]

**Figure 12. Acute hepatitis B notifications by year, 1997–2014**




The 2014 notification rate (0.8 per 100,000) was a slight increase from the 2013 rate (0.6 per 100,000).

Canterbury DHB (1.6 per 100,000) had the highest notification rate, followed by Waitemata DHB (0.9 per 100,000).

Adults in the 20–29 and 40–49 years age groups had the highest notification rates (1.3 per 100,000 each).

Males (1.1 per 100,000) had a higher rate than females (0.5 per 100,000).

Ethnicity was recorded for 32 (91.4%) cases. The Asian (1.4 per 100,000) and European or Other (0.6 per 100,000) ethnic groups had the highest notification rates for hepatitis B.

Hospitalisation status was recorded for 33 (94.3%) cases, of which 14 (42.4%) were hospitalised. One death due to hepatitis B was reported in 2014.

The risk factors recorded for hepatitis B are shown in Table 10. The most common risk factors reported were body piercing/tattooing in the last 12 months and overseas travel during the incubation period for the disease.

**Table 10. Exposure to risk factors associated with acute hepatitis B, 2014**

| Risk factor | Yes | No | Unknown | Percentage (%) [a] |
|---|---|---|---|---|
| Body piercing/tattooing in the last 12 months | 7 | 23 | 5 | 23.3 |
| Travelled overseas during the incubation period | 5 | 25 | 5 | 16.7 |
| Sexual contact with confirmed case or carrier | 4 | 20 | 11 | 16.7 |
| Household contact with confirmed case or carrier | 3 | 27 | 5 | 10.0 |
| Occupational exposure to blood | 2 | 28 | 5 | 6.7 |
| Case is a blood product or tissue recipient | 1 | 29 | 5 | 3.3 |
| History of injecting drug use | 1 | 28 | 6 | 3.4 |

[a] Percentage refers to the number of cases who answered "yes" out of the total number of cases for which this information was supplied. Some cases had more than one risk factor recorded.

## Hepatitis C

In New Zealand, only acute hepatitis C is a notifiable disease, so notification rates do not give an indication of the burden of chronic hepatitis C infection.

In 2014, 30 cases of hepatitis C were notified compared with 36 cases in 2013. After a peak of 102 cases in 1998 notifications steadily declined until 2004. The number of notifications has ranged from 16 to 36 in the last five years (Figure 13).

The 2014 notification rate (0.7 per 100,000) was similar to the 2013 rate (0.8 per 100,000).

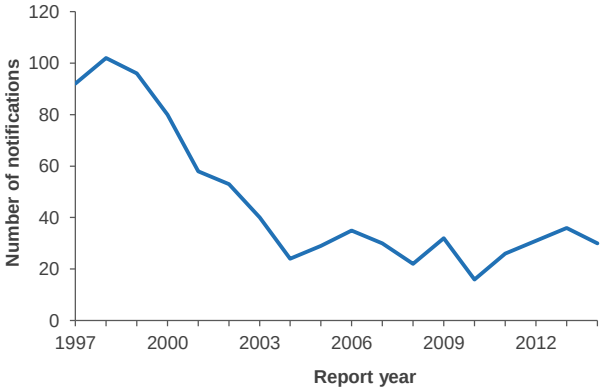
Northland DHB (3.0 per 100,000) had the highest notification rate, followed by Southern (1.6 per 100,000) and Canterbury (1.2 per 100,000) DHBs.

Adults in the 30–39 (1.6 per 100,000) and 20–29 years (1.5 per 100,000) age groups had the highest notification rates.

Males (0.8 per 100,000) had a slightly higher rate than females (0.6 per 100,000).

Ethnicity was recorded for 29 (96.7%) cases. The Māori (0.9 per 100,000) and European or Other (0.7 per 100,000) ethnic groups had the highest notification rates for hepatitis C.

**Figure 13. Acute hepatitis C notifications by year, 1997–2014**




Hospitalisation status was recorded for 29 (96.7%) cases, of which four (13.8%) were hospitalised.

For hepatitis C the most commonly reported risk factors were a history of injecting drug use and sexual contact with a confirmed case or carrier (Table 11).

**Table 11. Exposure to risk factors associated with acute hepatitis C, 2014**

| Risk factor | Yes | No | Unknown | Percentage (%) [a] |
|---|---|---|---|---|
| History of injecting drug use | 21 | 4 | 5 | 84.0 |
| Sexual contact with confirmed case or carrier | 7 | 7 | 16 | 50.0 |
| Body piercing/tattooing in the last 12 months | 7 | 12 | 11 | 36.8 |
| Household contact with confirmed case or carrier | 5 | 12 | 13 | 29.4 |
| Occupational exposure to blood | 1 | 24 | 5 | 4.0 |
| Travelled overseas during the incubation period | 0 | 21 | 9 | 0.0 |
| Blood product or tissue recipient | 0 | 19 | 11 | 0.0 |

[a] Percentage refers to the number of cases that answered "yes" out of the total number of cases for which this information was supplied. Some cases had more than one risk factor recorded.

## Hepatitis (viral) not otherwise specified

In 2014, eight cases of hepatitis (viral) not otherwise specified (NOS) were notified, compared with two cases in 2013. Five cases were hepatitis E and three were hepatitis D. The 2014 notification rate was 0.2 per 100,000.

### Hepatitis E

Hepatitis E cases were in the 20–29 (1 case), 60–69 (3 cases), and 70 years and over (1 case) age groups. Three cases were male and two were female.

Cases were in the European or Other (4 cases), and Asian (1 case) ethnic groups.

Hospitalisation status was recorded for four (80.0%) cases, of which three (75.0%) were hospitalised.

Travel history was recorded for all five cases, of which three cases reported travelling overseas during the incubation period for the disease.

### Hepatitis D

Hepatitis D cases were in the 20–29 (2 cases) and 40–49 years (1 case) age groups. Two cases were male and one was female.

Cases were all in the Pacific peoples ethnic group.

Hospitalisation status was recorded for all three cases, of which no cases were hospitalised.

Travel history was recorded for two cases (66.7%), of which neither case reported travelling overseas during the incubation period for the disease.

## Highly pathogenic avian influenza

Highly pathogenic avian influenza (HPAI) became a notifiable disease in New Zealand in February 2004. No human cases have been reported in New Zealand and no highly pathogenic avian influenza A(H5N1) has been reported in New Zealand animals.[21]

## Hydatid disease

Four cases of hydatid disease (*Echinococcus granulosus)* were notified in 2014 (2 confirmed and 2 probable), compared with seven in 2013. Since 1997, 64 cases of hydatid disease have been notified.

Cases were reported from Tairawhiti and Counties Manukau DHBs (2 cases each). Two cases were male. Two cases were in the 20-29 and two were in the 60–69 years age groups.

One of the probable cases, a female aged 20–29 years from the MELAA ethnic group, had visited Iraq and Syria during the incubation period for the disease. The other probable case, a male aged 60–69 years from the Māori ethnic group, was first diagnosed in 1995. He worked as a farm worker in New Zealand and had regular contact with dogs and livestock.

Hospitalisation status was recorded for all four cases, and two (50.0%) cases (1 confirmed and 1 probable) were hospitalised.

*Echinococcus* species are notifiable organisms under the Biosecurity Act 1993. All cases of hydatid disease are reported to the Ministry for Primary Industries for investigation of possible disease reservoirs in New Zealand animals. In September 2002, New Zealand was declared provisionally free of hydatids. Given the natural history of the disease, it is expected that cases may occur for some years.

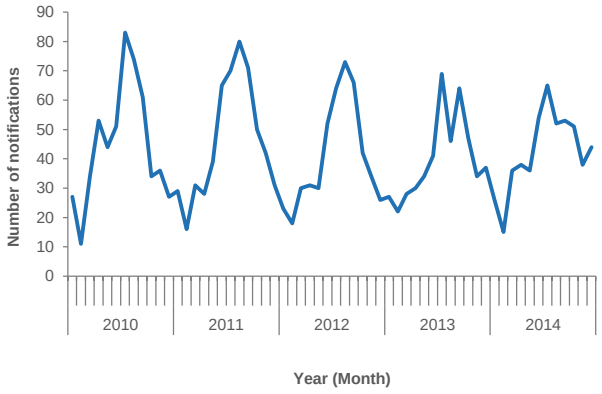
## Invasive pneumococcal disease

A full description of the epidemiology of invasive pneumococcal disease (IPD) will be reported separately in the 2014 Invasive Pneumococcal Disease in New Zealand report available from www.surv.esr.cri.nz.

In 2014, 508 cases of IPD were notified. The 2014 notification rate of 11.3 per 100,000 was slightly higher than the 2013 rate (10.8 per 100,000, 479 cases).

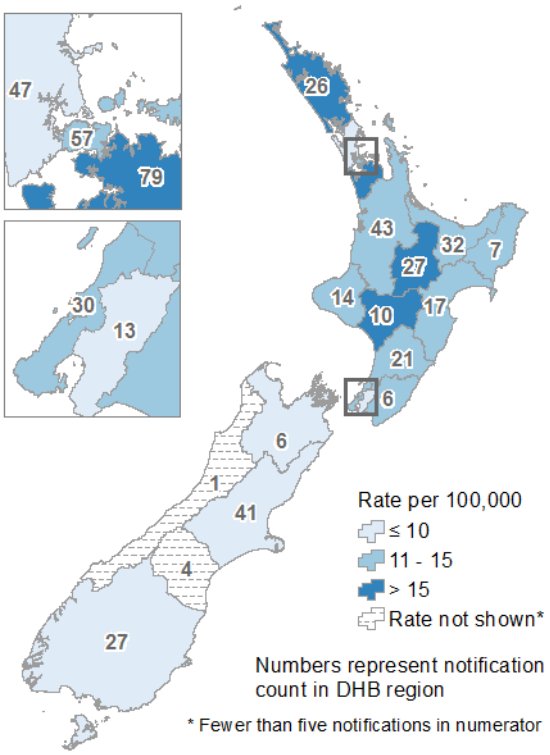
There is a distinct seasonal pattern for IPD, with the highest number of notifications reported during winter, and particularly in July, each year (Figure 14).

**Figure 14. Invasive pneumococcal disease notifications by month, January 2010–December 2014**




In 2014, the highest rates of IPD were reported from Lakes, Whanganui, Northland and Counties Manukau DHBs (26.1, 16.1, 15.7 and 15.5 per 100,000, respectively) (Figure 15).

### Figure 15. Invasive pneumococcal disease notifications by DHB, 2014




Infants aged under 1 year (39.1 per 100,000) and adults aged 70 years and over (36.2 per 100,000) had the highest rates of IPD.

Males (12.3 per 100,000) had higher rates than females (10.3 per 100,000).

Ethnicity was recorded for 481 (94.7%) cases. The Pacific peoples (24.1 per 100,000) and Māori (17.5 per 100,000) ethnic groups had the highest rates for IPD.

Further information on IPD rates by DHB, sex, age and ethnic group are in Tables 31 to 35 in the Appendix.

Hospitalisation status was recorded for 492 (96.9%) cases, of which 468 (95.1%) were hospitalised.

There were 22 deaths due to IPD reported in 2014. The deaths were in the 1–4 (1 case), 10–14 (1 case), 40–49 (3 cases), 60–69 (4 cases) years and 70 years and over (13) age groups.

The risk factors recorded for IPD are shown in Table 12 and Table 13. The most commonly reported risk factor for children aged under five years was exposure to smoking in the household. Having a chronic illness was the most common risk factor for cases aged five years and older.

### Table 12. Exposure to risk factors associated with invasive pneumococcal disease for cases aged under five years, 2014

| Risk factor | Yes | No | Unknown | Percentage (%)[a] |
|---|---|---|---|---|
| Smoking in the household | 5 | 6 | 53 | 45.5 |
| Attends childcare | 2 | 13 | 49 | 13.3 |
| Chronic illness | 7 | 47 | 10 | 13.0 |
| Premature (<37 weeks gestation)[b] | 3 | 22 | 39 | 12.0 |
| Immunocompromised | 4 | 45 | 15 | 8.2 |
| Anatomical or functional asplenia | 2 | 50 | 12 | 3.8 |
| Chronic lung disease or cystic fibrosis | 1 | 53 | 10 | 1.9 |
| Cochlear implants | 1 | 53 | 10 | 1.9 |

[a] Percentage refers to the percentage of cases who answered "yes" out of the total number of cases for which this information was supplied. Some cases had more than one risk factor recorded.
[b] Only cases aged under 1 year are included for reporting of this risk factor.

### Table 13. Exposure to risk factors associated with invasive pneumococcal disease for cases aged five years and over, 2014

| Risk factor | Yes | No | Unknown | Percentage (%)[a] |
|---|---|---|---|---|
| Chronic illness | 207 | 193 | 44 | 51.8 |
| Current smoker[b] | 90 | 243 | 91 | 27.0 |
| Immunocompromised | 70 | 335 | 39 | 17.3 |
| Chronic lung disease or cystic fibrosis | 60 | 344 | 40 | 14.9 |
| Resident in long-term or other chronic-care facility | 35 | 357 | 52 | 8.9 |
| Congenital or chromosomal abnormality | 5 | 381 | 58 | 1.3 |
| Anatomical or functional asplenia | 4 | 394 | 46 | 1.0 |

[a] Percentage refers to the percentage of cases who answered "yes" out of the total number of cases for which this information was supplied. Some cases had more than one risk factor recorded.
[b] Only cases aged 15 and over are included in the reporting of this risk factor.

**Table 14. Invasive pneumococcal disease notifications and vaccine uptake by age group, 2014**

| Age group | Total cases | One dose | Two doses | Three doses | Four doses | Five doses | Vaccinated (no dose info) | Not vaccinated | Unknown |
|---|---|---|---|---|---|---|---|---|---|
| <6 months | 11 | 2 | 4 | 1 | 0 | 0 | 0 | 4 | 0 |
| 6 months–4 years | 53 | 0 | 3 | 17 | 20 | 2 | 0 | 2 | 9 |
| 5–9 years | 14 | 1 | 0 | 0 | 3 | 0 | 1 | 3 | 6 |
| 10–19 years | 15 | 2 | 0 | 0 | 0 | 0 | 0 | 5 | 8 |
| 20+ years | 415 | 1 | 0 | 0 | 0 | 0 | 2 | 150 | 262 |
| **Total** | **508** | **6** | **7** | **18** | **23** | **2** | **3** | **164** | **285** |

Table 14 shows the vaccination status of cases by age group.

In June 2008, the 7-valent pneumococcal conjugate vaccine (PCV7) was added to the childhood immunisation schedule. In July 2011, the 10-valent conjugate vaccine (PCV10) replaced PCV7 on the schedule. In July 2014, PCV10 was replaced with the 13-valent conjugate vaccine (PCV13). The recommended schedule for PCV is four doses given to the infant at ages six weeks, three months, five months and 15 months.[20]

**Table 15. Invasive pneumococcal disease notifications by serotype and age group, 2014**

| Serotype | <5 years | 5–64 years | 65+ years | Total |
|---|---|---|---|---|
| 4 | 1 | 13 | 10 | 24 |
| 6B | | 1 | 1 | 2 |
| 9V | | 5 | 2 | 7 |
| 14 | 1 | 1 | 2 | 4 |
| 18C | 1 | 3 | 5 | 9 |
| 19F | 1 | 2 | 7 | 10 |
| 23F | | 1 | 1 | 2 |
| 1 | 1 | | | 1 |
| 5 | | | | 0 |
| 7F | 1 | 35 | 18 | 54 |
| 3 | 9 | 19 | 15 | 43 |
| 6A | | | 1 | 1 |
| 19A | 18 | 41 | 30 | 89 |
| Other (non-PCV13) | 22 | 93 | 117 | 232 |
| **Total**[a] | **55** | **214** | **209** | **478** |

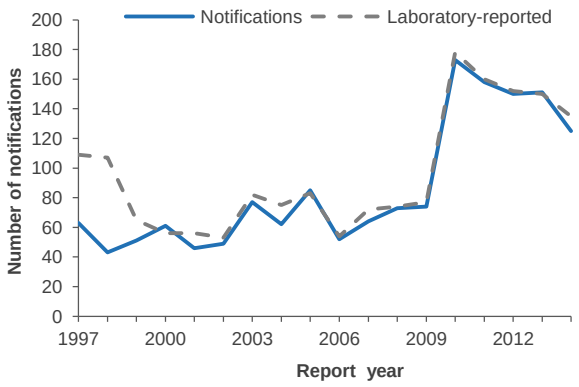
[a] Totals are for isolates of culture-positive cases referred to ESR for serotyping.
Note: The 7-valent pneumococcal conjugate vaccine (PCV7) covers serotypes 4, 6B, 9V, 14, 18C, 19F and 23F; PCV10 covers serotypes 1, 5 and 7F in addition to the PCV7 serotypes; and PCV13 covers serotypes 3, 6A and 19A in addition to the PCV10 serotypes.

The Invasive Pathogens Laboratory at ESR received a *Streptococcus pneumoniae* isolate from a normally sterile site for serotyping for 478 (94.1%) notified cases in 2014. Table 15 shows the breakdown of these 478 culture-positive cases by serotype and age group. Nearly 90% (49/55) of cases in the under five years age group were due to serotypes not covered by PCV10, compared with 71.5% (153/214) and 78.0% (163/209) of cases in the 5–64 years age group and 65 years and over age group, respectively. Serotype 19A, a PCV13 serotype, was the most prevalent type in all age groups. Serotype 7F, a PCV10 serotype, was the second most prevalent type in the 5–64 years age group and the 65 years and over age group.

## Legionellosis

During 2014, 125 cases of legionellosis were notified, representing a rate of 2.8 per 100,000. This was lower than the 2013 rate of 3.4 per 100,000 (151 cases). The yearly number of cases was fairly stable between 1997 and 2009, but increased in 2010 and has remained relatively high (Figure 16).

**Figure 16. Legionellosis notifications and laboratory-reported cases by year, 1997–2014**




West Coast, Canterbury and Northland DHBs had the highest notification rates (18.3, 7.8 and 4.8 per 100,000 respectively).

Adults aged 70 years and over (10.1 per 100,000) and 60–69 years (7.6 per 100,000) had the highest rates of legionellosis.

Males (4.0 per 100,000) had a higher rate than females (1.6 per 100,000).

**Table 16. Exposure to risk factors associated with legionellosis, 2014**

| Risk factor | Yes | No | Unknown | Percentage (%)[a] |
|---|---|---|---|---|
| Exposure to known environmental risk factor during the incubation period | 78 | 15 | 32 | 83.9 |
| Pre-existing immunosuppressive or debilitating condition | 44 | 58 | 23 | 43.1 |
| Smokes cigarettes | 21 | 84 | 20 | 20.0 |

[a] Percentage refers to the percentage of cases who answered "yes" out of the total number of cases for which this information was supplied. Some cases had more than one risk factor recorded.

Ethnicity was recorded for 124 (99.2%) cases. The European or Other ethnic group (3.6 per 100,000) had the highest notification rate for legionellosis, followed by the Pacific peoples (2.2 per 100,000) ethnic group. Further information by DHB, age, sex and ethnic group is in Tables 31 to 35 in the Appendix.

Hospitalisation status was recorded for 119 cases (95.2%), of which 100 (84.0%) were hospitalised.

One death due to legionellosis was reported in 2014. The case was in the 50–59 years age group. There were two additional deaths recorded among notified legionellosis cases, where the primary cause of death was unknown. One of these cases had a pre-existing immunosuppressive condition.

Table 16 provides a summary of risk factors for which data was available. A total of 78 (83.9%) cases reported exposure to known environmental risk factors during the incubation period for the disease.

Further details of the exposures were recorded for 65 of these 78 cases as follows: compost, potting mix or soil (51), shower or hot water system (13), fountain (2), air conditioning unit or heat pump (1), cooling tower (1) and spa or indoor pool (1). Some cases reported more than one exposure to known environmental risk factors. Three people had travelled overseas travel during the incubation period for the disease.

The Legionella Reference Laboratory at ESR reported 135 cases infected with *Legionella* in 2014. Table 17 shows the strains identified for those cases. As in previous years, the most common *Legionella* species identified were *L. longbeachae* (54.1%, 73 cases) and *L. pneumophila* (34.1%, 46 cases).

In 2014, one outbreak of *L. pneumophila* was reported, involving three cases.

**Table 17. *Legionella* strains for laboratory-reported cases, 2014**

| *Legionella* species and serogroup | Cases | Percentage (%) |
|---|---|---|
| ***L. longbeachae*** | **73** | **54.1** |
| *L. longbeachae* sg 1 | 19 | 14.1 |
| *L. longbeachae* sg 2 | 10 | 7.4 |
| *L. longbeachae* sg not determined | 44 | 32.6 |
| ***L. pneumophila*** | **46** | **34.1** |
| *L. pneumophila* sg 1 | 23 | 17.0 |
| *L. pneumophila* sg 2 | 1 | 0.7 |
| *L. pneumophila* sg 3 | 1 | 0.7 |
| *L. pneumophila* sg 4 | 2 | 1.5 |
| *L. pneumophila* sg 6 | 1 | 0.7 |
| *L. pneumophila* sg 11 | 1 | 0.7 |
| *L. pneumophila* sg 12 | 12 | 8.9 |
| *L. pneumophila* sg 13 | 1 | 0.7 |
| *L. pneumophila* sg 15 | 1 | 0.7 |
| *L. pneumophila* sg not determined | 3 | 2.2 |
| **Other *Legionella* species** | **16** | **11.9** |
| *L. micdadei* | 8 | 5.9 |
| *L. dumoffii* | 2 | 1.5 |
| *L. gormanii* | 1 | 0.7 |
| *L. jordanis* | 1 | 0.7 |
| *L. sainthelensi* | 2 | 1.5 |
| *Legionella* species not determined | 2 | 1.5 |
| **Total** | **135** | **100** |

## Leprosy

In 2014, four cases of leprosy were notified, compared with seven cases in 2013.

Cases were reported from Auckland, Counties Manukau, Hutt Valley and Canterbury DHBs (1 case each).

The cases were in the 20–29, 30–39, 60–69 years and 70 years and over (1 case each) age groups. All were male and in the Pacific peoples ethnic group.

All four cases were laboratory-confirmed. The clinical form of leprosy was recorded as lepromatous (3 cases) and tuberculoid (1 case).

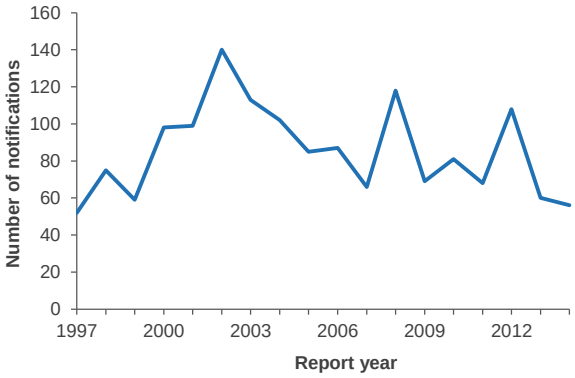
One case was hospitalised. All cases reported travelling overseas during the incubation period for the disease. The countries lived in or visited by the cases were Samoa (3 cases) and the Cook Islands (1 case).

## Leptospirosis

In 2014, a total of 56 cases of leptospirosis were notified. The 2014 rate of 1.2 cases per 100,000 was a slight decrease from the notification rate in 2013 (1.4 per 100,000, 60 cases). Of the 56 notified cases, 55 were laboratory-confirmed by either microscopic agglutination titre (MAT) (39 cases), or nucleic acid testing (NAT) (10 cases) or both MAT and NAT (6 cases). One case was not laboratory-confirmed and has since been made 'not a case' (and is excluded from the following analysis).

Figure 17 shows the number of notified cases of leptospirosis each year since 1997.

**Figure 17. Leptospirosis notifications by year, 1997–2014**




The highest notification rates for leptospirosis were reported from Hawke's Bay, Northland, Waikato and Southern DHBs (9.4, 3.0, 1.8 and 1.6 per 100,000 respectively).

The highest notification rates were for the 50–59 (2.7 per 100,000) and 40–49 years (2.1 per 100,000) age groups.

Males had a higher notification rate (2.3 per 100,000) than females (0.2 per 100,000).

Ethnicity was recorded for all cases. The highest notification rates were for the Māori (1.8 per 100,000) and European or Other (1.3 per 100,000) ethnic groups.

All 55 cases had hospitalisation status recorded, and 33 (60.0%) were hospitalised.

Occupation was recorded for 53 (96.4%) of the 55 cases. Of these, 42 (79.2%) were engaged in occupations previously identified as high-risk for exposure to *Leptospira* spp. in New Zealand.[22] The percentage of such cases was slightly higher than reported in 2013 (71.4%), but similar to the percentage reported in 2012 (76.9%). Of the 42 cases with a high-risk occupation, 30 (71.4%) were farmers or farm workers and 12 (28.6%) worked in the meat processing industry (as freezing workers, meat process workers or butchers). Of the 13 cases that did not report a high-risk occupation (or had no occupation recorded), eight reported animal/outdoor exposures, four had contact with lakes, rivers and streams, and three had travelled overseas during the incubation period for the disease. Three cases reported more than one risk factor.

The Leptospira Reference Laboratory at ESR reported 40 cases of infection with *Leptospira* in 2014. Table 18 presents the species and serovars identified for those cases. The most common *Leptospira* serovars reported were *Leptospira borgpetersenii* sv Hardjo (47.5%, 19 cases) and *Leptospira borgpetersenii* sv Ballum (20.0%, 8 cases).

No outbreaks of leptospirosis were reported in 2014.

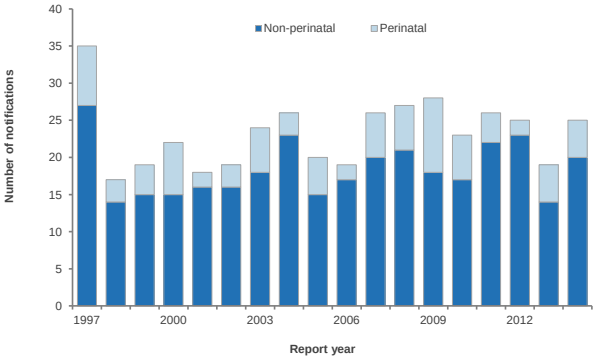
**Table 18. *Leptospira* species and serovars for laboratory-reported cases, 2014**

| ***Leptospira* species and serovar** | **Cases** | **Percentage (%)** |
|---|---|---|
| ***L. borgpetersenii*** | **28** | **70.0** |
| *L. borgpetersenii* sv Hardjo | 19 | 47.5 |
| *L. borgpetersenii* sv Ballum | 8 | 20.0 |
| *L. borgpetersenii* sv Tarassovi | 1 | 2.5 |
| ***L. interrogans*** | **9** | **22.5** |
| *L. interrogans* sv Pomona | 7 | 17.5 |
| *L. interrogans* sv Australis | 1 | 2.5 |
| *L. interrogans* sv Copenhageni | 1 | 2.5 |
| ***Leptospira* serovar not identified** | **3** | **7.5** |
| **Total** | **40** | **100.0** |

## Listeriosis

In 2014, 25 cases of listeriosis were notified compared with 19 cases in 2013. Figure 18 shows listeriosis notifications (both perinatal and non-perinatal) for each year since 1997. The 2014 notification rate (0.6 per 100,000) was similar to the 2013 rate (0.4 per 100,000). The notification rate has been relatively stable for the past 17 years (ranging from 0.4 to 0.7 per 100,000), since a peak of 0.9 per 100,000 in 1997.

**Figure 18. Listeriosis notifications (perinatal and non-perinatal) by year, 1997–2014**



### Perinatal

Five cases of perinatal listeriosis were notified in 2014. The length of gestation was known for all perinatal cases, with a range of 24–39 weeks. The cases were in the 30–39 (4 cases) and 20–29 years (1 case) age groups. The ethnic groups of the cases were Pacific peoples (2 cases), European or Other (2 cases) and Māori (1 case). Two cases resulted in perinatal deaths.

### Non-perinatal

The 20 non-perinatal listeriosis cases were from eight DHBs, with the highest number of notifications reported in Counties Manukau DHB (6 cases), followed by Auckland and Bay of Plenty DHBs (3 cases each).

Nineteen non-perinatal cases were aged 50 years and over (including 10 cases aged 70 years and over) and one case was aged 40–49 years. Twelve cases were male and eight were female.

The European or Other ethnic group (12 cases) had the highest number of cases of non-perinatal listeriosis, followed by the Asian (5 cases), Māori, MELAA, and Pacific peoples (1 case each) ethnic groups.

Fourteen non-perinatal cases were hospitalised for listeriosis and six were hospitalised for the treatment of another illness.

Information on underlying illness was recorded for all non-perinatal cases and 17 cases (85.0%) had an underlying illness such as cancer, autoimmune disease, heart disease, diabetes or another chronic illness. Eight cases were reported to be receiving immunosuppressive drugs.

Three non-perinatal deaths were reported in 2014, all in the 70 years and over age group.

The Special Bacteriology Laboratory at ESR serotyped 28 isolates of *Listeria monocytogenes* in 2014. The serotypes identified were O4 (16 isolates, 57.1%) and O1/2 (12 isolates, 42.9%).

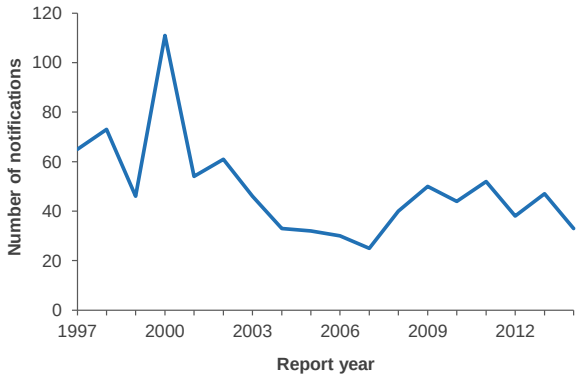
No outbreaks of *Listeria* were reported during 2014.

## Malaria

In 2014, 33 cases of malaria were notified compared with 47 cases in 2013 (Figure 19). The 2014 notification rate (0.7 per 100,000) was slightly lower than the 2013 rate (1.1 per 100,000).

Adults in the 20–29 and 50–59 years age groups had the highest notification rates (1.9 and 1.2 per 100,000 respectively).

**Figure 19. Malaria notifications by year, 1997–2014**




Males had a higher notification rate than females (1.1 and 0.3 per 100,000 respectively).

Ethnicity was recorded for 32 (97.0%) cases. The Asian (3.5 per 100,000) ethnic group had the highest notification rate, followed by the European or Other (0.3 per 100,000) ethnic group.

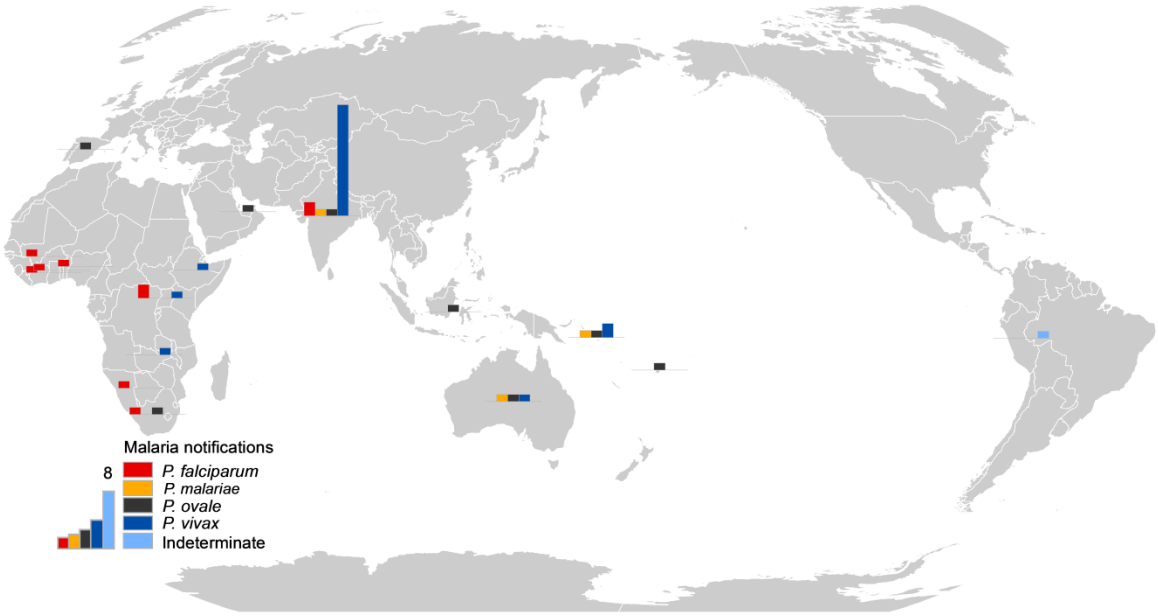
Hospitalisation status was recorded for 28 (84.8%) cases, of which 19 (67.9%) were hospitalised.

All cases had either lived or travelled overseas during the incubation period for the disease or had a prior history of travel to malaria-endemic areas.

Figure 20 presents the region and country of overseas travel and *Plasmodium* species identified for malaria notifications in 2014. The region most commonly reported for cases with *P. vivax* was Southern and Central Asia (16 cases). For cases identified with *P. falciparum*, the region most commonly reported was Sub-Saharan Africa (8 cases). The country with the highest number of malaria cases was India (20 cases), of which 16 cases were identified with *P. vivax* (Table 19). It should be noted that some cases were infected with more than one *Plasmodium* species and reported travelling to more than one country.

Malaria prophylaxis was prescribed for three cases, and all reported taking it as prescribed. Twelve cases did not have prophylaxis prescribed and prophylaxis information was unknown for 18 cases.

## Figure 20. *Plasmodium* species and country of overseas travel for malaria notifications, 2014




Note: Some cases reported travelling to more than one country during the incubation period for the disease. Those who travelled to Australia also said they have travelled to another malaria-endemic country (Solomon Islands, Uganda and Zambia).

## Table 19. Region and country of overseas travel and *Plasmodium* species for malaria notifications, 2014

| Region | Country resided in or visited | Plasmodium species | | | | |
|---|---|---|---|---|---|---|
| | | *P. vivax* | *P. falciparum* | *P. ovale* | *P. malariae* | Indeterminate |
| North Africa and the Middle East | United Arab Emirates | | | 1 | | |
| Sub-Saharan Africa | Botswana | | 1 | | | |
| | Burkina Faso | | 1 | | | |
| | Central and West Africa nfd[a] | 1 | | | | |
| | Ethiopia | 1 | | | | |
| | Ghana | | 1 | | | |
| | Nigeria | | 1 | | | |
| | South Africa | | 1 | 1 | | |
| | Togo | | 1 | | | |
| | Uganda | 1 | 2 | | | |
| | Zambia | 1 | | | | |
| Southern and Central Asia | India | 16 | 2 | 1 | 1 | |
| Southeast Asia | Indonesia | | | 1 | | |
| Oceania | Australia[b] | 1 | | 1 | 1 | |
| | Fiji | | | 1 | | |
| | Solomon Islands | 2 | | 1 | 1 | |
| The Americas | Peru | | | | | 1 |
| Southern and Eastern Europe | Spain | | | 1 | | |

[a] nfd: not further defined.

[b] These cases also said they had travelled to another malaria-endemic country: Solomon Islands, Uganda and Zambia (1 case each).

Note: Some cases were infected with more than one *Plasmodium* species and reported travelling to more than one country during the incubation period for the disease.

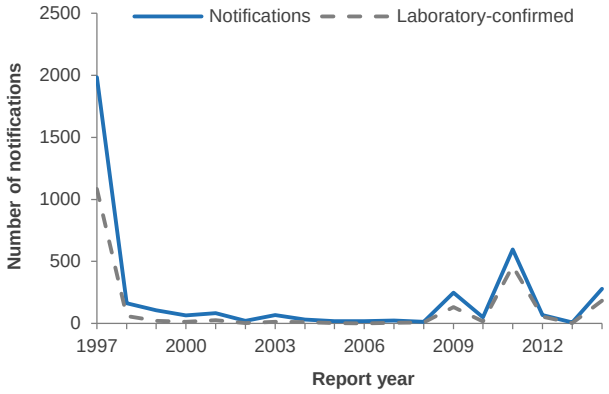
## Measles

Measles immunisation was introduced in 1969 [20] and measles has been a notifiable disease since June 1996.[4] Since January 2001, the recommended measles, mumps and rubella (MMR) immunisation schedule has been two doses, the first given at age 15 months and the second at age four years. During measles outbreaks, the first dose may be advanced to age 12 months and the MMR vaccine may be recommended for infants aged under 12 months if cases are occurring in the very young.[20]

In 2014, 280 cases of measles were notified and all were confirmed (including 184 laboratory-confirmed cases). In 2013, eight cases of measles were notified, of which seven were confirmed cases (including three laboratory-confirmed cases) (Figure 21). The 2014 notification rate (6.2 per 100,000) was a significant increase from the 2013 notification rate (0.2 per 100,000).

Of the DHBs that reported five or more cases, the highest rates were for Waikato (32.6 per 100,000, 125 cases), Waitemata (11.2 per 100,000, 63 cases), Lakes (8.7 per 100,000, 9 cases) and Hawke's Bay (7.5 per 100,000, 12 cases) DHBs.

**Figure 21. Measles notifications and laboratory-confirmed cases by year, 1997–2014**




The highest notification rate was for the 15–19 years age group (29.7 per 100,000, 93 cases), followed by the 10–14 (27.0 per 100,000, 80 cases), under 1 (23.8 per 100,000, 14 cases) and 1–4 years (12.4 per 100,000, 31 cases) age groups.

Males (8.0 per 100,000, 176 cases) had a higher notification rate than females (4.5 per 100,000, 104 cases).

The Māori ethnic group (16.0 per 100,000, 108 cases) had the highest notification rate for measles, followed by the Pacific peoples (6.8 per 100,000, 19 cases), Asian (5.5 per 100,000, 28 cases), and European or Other (3.7 per 100,000, 112 cases) ethnic groups.

Hospitalisation status was recorded for 270 (96.4%) cases, of which 48 (17.8%) cases were hospitalised.

Vaccination status was known for 239 (85.4%) cases. Of these, 193 (80.8%) cases were not vaccinated, including 26 cases who were under 15 months and so ineligible for vaccination. Seventeen cases had received one dose of vaccine and 24 cases had received two doses of MMR vaccine. A further five cases were reported as being vaccinated, but no dose information was available (Table 20).

Of the cases for which risk factor information was recorded, 211 (85.1%) reported contact with another measles case in the previous three weeks, 63.5% (172/271) attended school, pre-school or childcare, and 9.0% (21/233) reported travelling overseas during the incubation period for the disease.

Nineteen measles outbreaks were reported in 2014, involving 243 cases.

The Ministry of Health hospitalisation data included 65 hospitalisations in 2014 where measles was the principal diagnosis.

**Table 20. Age group and vaccination status of measles notifications, 2014**

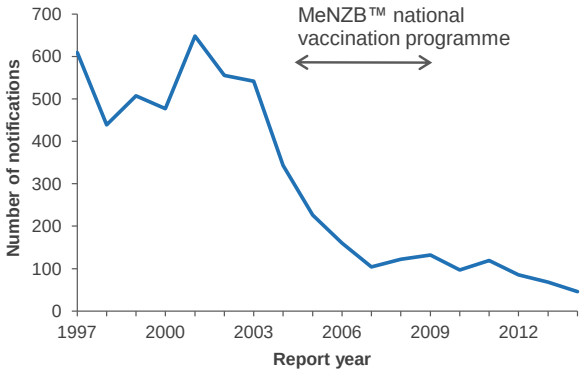
| Age group | Total cases | One dose | Two doses | Vaccinated (no dose info) | Not vaccinated | Unknown |
|---|---|---|---|---|---|---|
| <15 months | 26 | 0 | 0 | 0 | 26 | 0 |
| 15 months–3 years | 16 | 3 | 0 | 0 | 13 | 0 |
| 4–9 years | 22 | 2 | 0 | 0 | 20 | 0 |
| 10–19 years | 173 | 12 | 22 | 2 | 113 | 24 |
| 20+ years | 43 | 0 | 2 | 3 | 21 | 17 |
| **Total** | 280 | 17 | 24 | 5 | 193 | 41 |

## Meningococcal disease

In 2014, 46 cases of meningococcal disease were notified. The notification rate (1.0 per 100,000) was a significant decrease from the 2013 rate (1.5 per 100,000, 68 cases). The rate was also a significant decrease from the peak rate (16.7 per 100,000 in 2001) experienced during the New Zealand meningococcal disease epidemic (driven by the B:P1.7-2,4 strain). The 2014 rate is below the rate observed in the immediate pre-epidemic years (1989–1990).

Figure 22 shows the number of meningococcal disease notifications from 1997 to 2014.

**Figure 22. Meningococcal disease notifications by year, 1997–2014**




Of the three DHBs that reported five or more cases in 2014, the highest rate was for Southern (1.6 per 100,000, 5 cases), followed by Waikato (1.3 per 100,000, 5 cases) and Canterbury (1.2 per 100,000, 6 cases) DHBs.

The highest rate was for the under 1 year age group (10.2 per 100,000, 6 cases), followed by the 1–4 years age group (6.0 per 100,000, 15 cases).

Males (1.1 per 100,000, 24 cases) and females (1.0 per 100,000, 22 cases) had similar notification rates.

Ethnicity was recorded for 97.8% of cases. The Māori ethnic group (2.4 per 100,000, 16 cases) had the highest notification rate for meningococcal disease, followed by the European or Other (0.8 per 100,000, 25 cases) ethnic groups.

Hospitalisation status was recorded for 45 (97.8%) cases, of which 44 (97.8%) were hospitalised. For the hospitalised cases, pre-hospital management information was recorded for 43 (97.7%) cases. Of these, 22 (51.2%) cases were seen by a doctor prior to hospital admission and only five (11.6%) were given intravenous or intramuscular antibiotics before admission. One case did not report seeing a doctor but was given intramuscular antibiotics.

Three deaths were reported during 2014 giving a case fatality rate of 6.5%. Two of the cases had seen a doctor, but had not been given antibiotics. The third case did not see a doctor.

Thirty-eight (82.6%) cases were laboratory-confirmed and the strain type was determined for 36 cases: group B (26 cases, including 13 B:P1.7-2,4), group C (6 cases, including 5 C:P1.5-1,10-8, the dominant circulating C strain since 2005), group Y (3 cases) and group 29E (1 case).

The antimicrobial susceptibility of 27 viable meningococcal isolates received by ESR from cases of invasive disease in 2014 was tested. All isolates were susceptible to ceftriaxone, rifampicin and ciprofloxacin. Forty-four percent (12/27) had reduced susceptibility to penicillin, with minimum inhibitory concentrations of 0.12–0.5 mg/L.

## Middle East respiratory syndrome Coronavirus

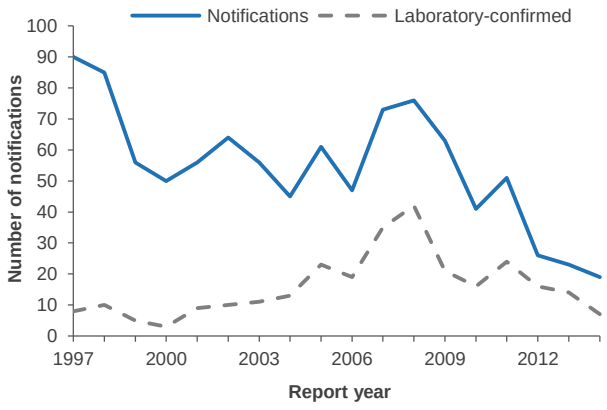
MERS-CoV became notifiable in New Zealand on 6 September 2013. Although no cases have been reported in New Zealand, worldwide 971 confirmed cases of human infection with MERS-CoV (including 356 deaths) were reported to WHO from September 2012 to 5 February 2015.[23]

## Mumps

Immunisation against mumps was introduced to the New Zealand Immunisation Schedule in 1990 as part of the MMR vaccine, [20] and mumps became notifiable in June 1996.[4] The last epidemic occurred in 1994.[21]

In 2014, 19 cases of mumps were notified (7 were laboratory-confirmed) compared with 23 cases in 2013 (14 laboratory-confirmed). Figure 23 shows notifications and laboratory-confirmed cases from 1997 to 2014. The 2014 notification rate (0.4 per 100,000) was similar to the 2013 rate (0.5 per 100,000).

**Figure 23. Mumps notifications and laboratory-confirmed cases by year, 1997–2014**




Canterbury DHB (5 cases) had the highest number of cases, followed by Auckland DHB (3 cases). The remaining 11 cases were spread across eight DHBs.

Cases ranged in age from 11 months to 86 years, with almost half of the cases aged less than 10 years.

**Table 21. Age group and vaccination status of mumps notifications, 2014**

| Age group | Total cases | One dose | Two doses | Vaccinated (no dose info) | Not vaccinated | Unknown |
|---|---|---|---|---|---|---|
| <15 months[a] | 1 | 0 | 0 | 0 | 1 | 0 |
| 15 months–3 years | 1 | 1 | 0 | 0 | 0 | 0 |
| 4–9 years | 6 | 2 | 2 | 0 | 1 | 1 |
| 10–19 years | 3 | 0 | 2 | 0 | 0 | 1 |
| 20+ years | 8 | 1 | 0 | 1 | 2 | 4 |
| **Total** | **19** | **4** | **4** | **1** | **4** | **6** |

[a] Children aged under 15 months are ineligible for vaccination.

Males had a higher notification rate (0.6 per 100,000, 13 cases) than females (0.3 per 100,000, 6 cases).

Ethnicity was recorded for 18 (94.7%) cases. The European or Other ethnic group (8 cases) had the highest notification rate, followed by the Asian (4 cases), Māori (3 cases), MELAA (2 cases), and Pacific peoples (1 case) ethnic groups.

Hospitalisation status was recorded for 18 (94.7%) cases, of which two (11.1%) were hospitalised.

Of the cases for which risk factor information was recorded, 53.8% (7/13) attended school, pre-school or childcare, 9.1% (1/11) had contact with another laboratory-confirmed case of the disease and 7.7% (1/13) reported travelling overseas during the incubation period for the disease.

The recommended vaccination schedule for mumps is two doses of the MMR vaccine, at ages 15 months and four years.[20] In 2014, 13 cases (68.4%) had a known vaccination status. Of these, four were not vaccinated, including one infant aged under 15 months who was ineligible for vaccination. Four cases had received one dose of vaccine and four cases had received two doses of vaccine. One further case had been vaccinated, but no dose information was available (Table 21).

The Ministry of Health hospitalisation data recorded 16 hospitalisations in 2014 where mumps was the principal diagnosis.

## Non-seasonal influenza

Non-seasonal influenza became a notifiable and quarantinable disease in New Zealand in April 2009, with confirmed cases requiring evidence of influenza A(H1N1)pdm09 infection (the pandemic strain). This strain was re-classified as seasonal on 1 January 2011.

In August 2013, influenza A(H7N9) became notifiable as non-seasonal influenza. No cases have been notified to date.

## Paratyphoid fever

In 2014, 21 cases of paratyphoid fever were notified compared with 25 cases in 2013. The 2014 notification rate (0.5 per 100,000) was similar to the 2013 rate (0.6 per 100,000). Figure 24 shows the number of notifications and laboratory-reported cases of paratyphoid fever each year since 1997.

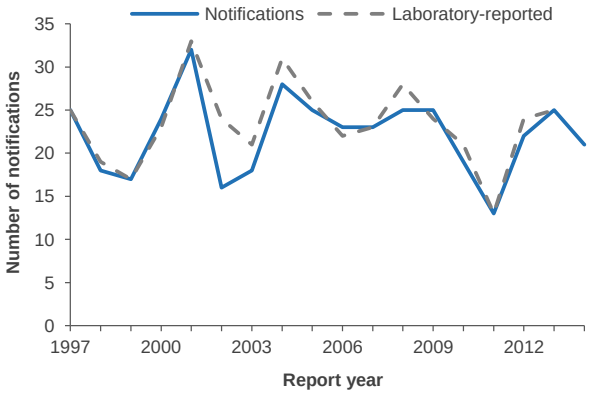
Adults aged 20–29 and 30–39 years had the highest notification rates (1.5 and 0.9 per 100,000 respectively).

Males (0.4 per 100,000) and females (0.5 per 100,000) had a similar rate.

The Asian (1.8 per 100,000) ethnic group had the highest notification rate.

Hospitalisation status was recorded for 20 (95.2%) cases, of which 11 (55.0%) were hospitalised.

**Figure 24. Paratyphoid fever notifications and laboratory-reported cases by year, 1997–2014**




Of the 21 cases notified in 2014, 19 (90.5%) had lived or travelled overseas during the incubation period for the disease. Two cases had not travelled overseas. The countries most commonly lived in or visited were Indonesia (6 cases), India (5 cases) and Singapore (3 cases). Some cases reported travelling to more than one country.

The Enteric Reference Laboratory at ESR confirmed 21 isolates as *Salmonella* Paratyphi during 2014. The serotypes identified were *S.* Paratyphi B var.

Java (13 isolates), *S.* Paratyphi A (7 isolates) and *S.* Paratyphi B (1 isolate). It should be noted that isolates of *S.* Paratyphi B var. Java are currently notified as paratyphoid fever. However, the spectrum of illness associated with *S.* Paratyphi B var. Java infection is more consistent with non-typhoidal salmonellosis.[24]

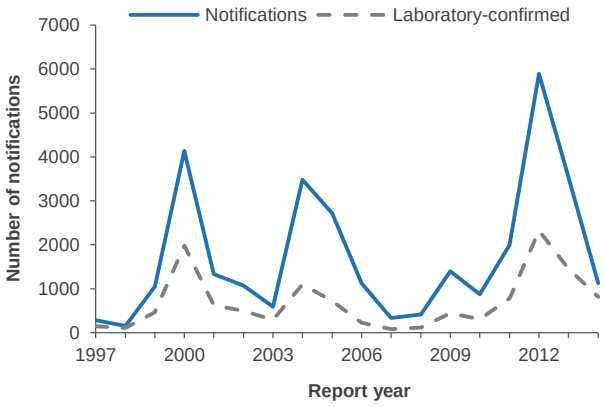
One outbreak of paratyphoid fever involving two cases was reported in 2014.

## Pertussis (whooping cough)

Pertussis is a vaccine-preventable disease caused by the bacterial agent *Bordetella pertussis*. Epidemics occur every 2–5 years, predominantly in young children, with a periodicity that is less affected by mass immunisation than other childhood vaccine-preventable diseases.[20] A recent national outbreak of pertussis occurred from 2011 to 2013. Pertussis vaccination has been part of the routine immunisation schedule in New Zealand since 1960. Pertussis has been notifiable since 1996.[4]

In 2014, 1127 pertussis cases were notified, of which 446 (39.6%) were laboratory-confirmed by isolating *Bordetella pertussis* from the nasopharynx and 153 cases (13.6%) were laboratory-confirmed by PCR. The 2014 notification rate (25.0 per 100,000) was a significant decrease from the 2013 notification rate (79.2 per 100,000, 3540 cases) (Figure 25).

**Figure 25. Pertussis notifications and laboratory-confirmed cases by year, 1997–2014**




The pertussis notification rate varied by DHB region, with the highest rate reported in Nelson Marlborough DHB (43.3 per 100,000, 62 cases), followed by Waitemata (36.1 per 100,000, 203 cases), Waikato (32.1 per 100,000, 123 cases), Counties Manukau (31.6 per 100,000, 161 cases) and Capital & Coast (30.3 per 100,000, 90 cases) DHBs (Figure 26).

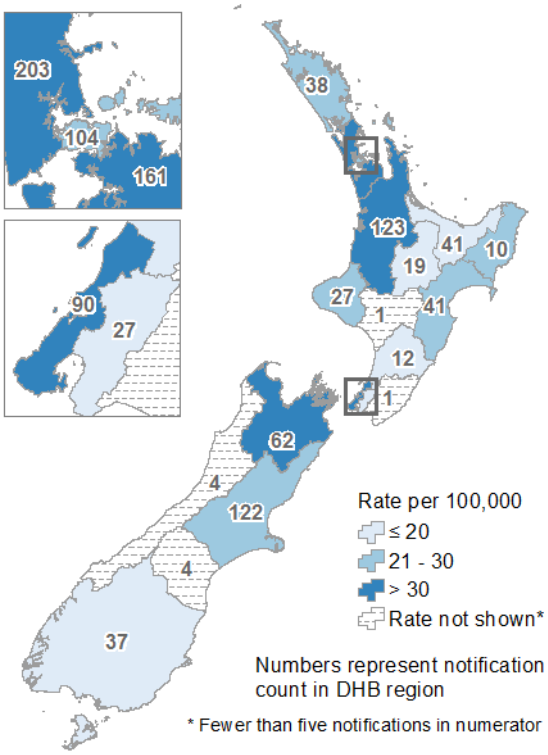
The highest notification rate was for the <1 year age group (151.1 per 100,000, 89 cases), followed by the 1–4 (52.4 per 100,000, 131 cases), 40–49 (27.0 per 100,000, 169 cases) and 5–9 years (24.8 per 100,000, 76 cases) age groups.

Females (27.7 per 100,000, 636 cases) had a higher notification rate than males (22.2 per 100,000, 491 cases).

The Pacific peoples (27.7 per 100,000, 77 cases) ethnic group had the highest notification rate for pertussis, followed by the European or Other (26.0 per 100,000, 780 cases), and Māori (24.4 per 100,000, 164 cases) ethnic groups.

Hospitalisation status was recorded for 885 (78.5%) cases, of which 81 (9.2%) were hospitalised. Approximately 47% (35/75) of cases in the <1 year age group were hospitalised. The proportion of hospitalised cases by ethnic group was: MELAA (40.0%, 2/5), Pacific peoples (35.2%, 19/54), Māori (13.9%, 20/144), and European or Other (5.9%, 37/631).

**Figure 26. Pertussis notifications by DHB, 2014**




Since March 2008, the recommended immunisation schedule for pertussis has been a primary course of DTaP-IPV-HepB/Hib at ages six weeks, three months and five months, followed by booster doses at ages four years (DTaP-IPV) and 11 years (Tdap).[20]

Vaccination status was known for 519 (46.1%) cases (Table 22). Of these, 232 (44.7%) cases were not vaccinated, including 11 infants aged under six weeks who were ineligible for vaccination. Fifty-two (10.0%) cases had received one dose of pertussis vaccine, 11 (2.1%) had received two doses and 153 (29.5%) had received three or more doses. A further 71 (13.7%) cases were reported as being vaccinated, but no dose information was available.

**Table 22. Age group and vaccination status of pertussis notifications, 2014**

| Age group | Total cases | One dose | Two doses | Three doses | Four doses | Five doses | Vaccinated (no dose info) | Not vaccinated | Unknown |
|---|---|---|---|---|---|---|---|---|---|
| 0–5 weeks[a] | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 1 |
| 6 weeks–2 months | 35 | 18 | 0 | 0 | 0 | 0 | 3 | 10 | 4 |
| 3–4 months | 12 | 4 | 4 | 0 | 0 | 0 | 0 | 1 | 3 |
| 5 months–3 years | 132 | 1 | 4 | 74 | 3 | 0 | 7 | 36 | 7 |
| 4–10 years | 121 | 5 | 1 | 10 | 45 | 2 | 8 | 30 | 20 |
| 11+ years | 815 | 24 | 2 | 1 | 5 | 13 | 53 | 144 | 573 |
| **Total** | **1127** | **52** | **11** | **85** | **53** | **15** | **71** | **232** | **608** |

[a] Children aged under six weeks are ineligible for vaccination.

Vaccination status was known for 54 (66.7%) of the hospitalised cases. Of these, 24 (44.4%) cases had not been vaccinated, 15 (27.8%) had received one dose of pertussis vaccine and 13 (24.1%) had received three or more doses. A further two cases were reported as being vaccinated, but no dose information was available.

Almost a quarter (23.8%, 171/720) of cases had attended school, pre-school or childcare and 22.0% (129/586) of cases reported contact with a laboratory-confirmed case of pertussis.

Ministry of Health hospitalisation data for 2014 included 111 hospitalisations for which pertussis was the principal diagnosis.

## Plague

The last case of *Yersinia pestis* infection in New Zealand was reported in 1911, during the last plague pandemic that originated in Hong Kong in 1894.

From 1900 to 1911, 21 cases of plague were recorded in New Zealand, nine of which were fatal.[25]

## Poliomyelitis (polio)

There were no polio notifications in 2014.

The New Zealand Paediatric Surveillance Unit carries out active surveillance of acute flaccid paralysis (AFP) to demonstrate the absence of wild polio virus. In 2014, eight cases of AFP were notified to the Unit. All eight cases were reviewed by the National Certification Committee for the Eradication of Polio (NCCEP) and classified as non-polio.

Since the mass oral polio vaccine (OPV) immunisation campaigns in New Zealand in 1961 and 1962, six polio cases have been reported. All were either laboratory-confirmed as vaccine-associated (4 cases) or classified as probable vaccine-associated cases (2 cases).[20] The most recent vaccine-associated case occurred in 1999.[26] No cases have been reported since the inactivated polio vaccine (IPV) replaced OPV in 2002.

In 1976, an imported case of wild polio virus infection was managed in New Zealand after a child arrived unwell from Tonga.[20]

## Primary amoebic meningoencephalitis

The last case of primary amoebic meningoencephalitis (*Naegleria fowleri)* in New Zealand was notified in 2000. There were five prior cases in New Zealand, four of which were part of the same outbreak in 1968. All six cases in New Zealand were fatal and were linked to swimming in geothermal pools in the central North Island.[27]

## Q fever

No cases of Q fever (*Coxiella burnetii*) were notified in 2014. Only three cases of Q fever have been notified in New Zealand since 1997, one case each year in 2004, 2010 and 2011. All three cases reported travelling overseas during the incubation period for the disease.

Q fever was previously reported under rickettsial diseases.

## Rabies and other lyssaviruses

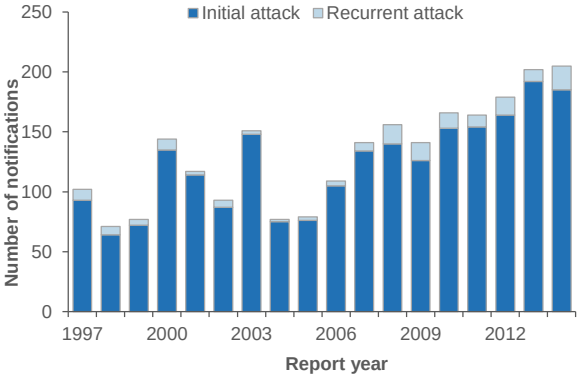
New Zealand is classified as a rabies-free country.[28] No cases of rabies or other lyssavirus have been reported in New Zealand

## Rheumatic fever

In 2014, 185 cases of initial attack of rheumatic fever and 20 recurrent cases of rheumatic fever were notified. This is a rate of 4.1 per 100,000 for initial attack cases and 0.4 per 100,000 for recurrent cases (and an overall rate of 4.5 per 100,000). This is the same as the rate reported for 2013. Figure 27 shows the number of initial attack and recurrent cases of rheumatic fever reported each year since 1997.

The onset date was reported for 188 of the 205 rheumatic fever cases (91.7%). Of these, the delay between the onset date and report date was more than 100 days for 46 (24.5%) cases.

### Figure 27. Rheumatic fever (initial attack and recurrent cases) by year, 1997–2014



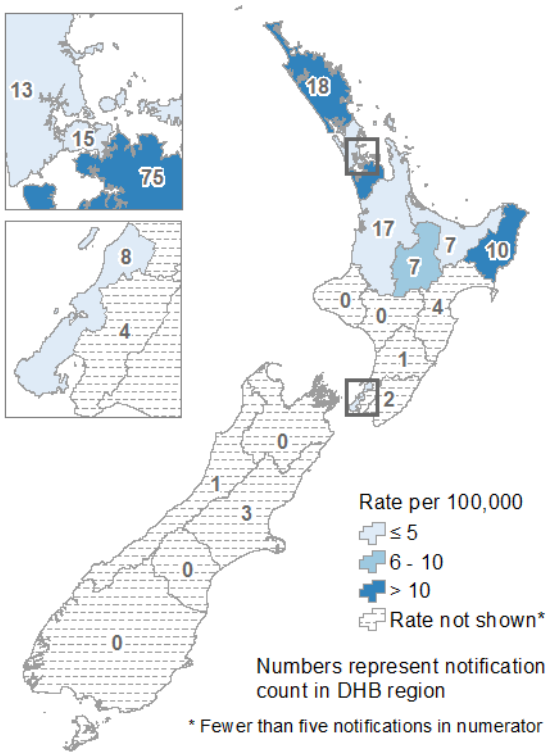

The following analysis is for cases of initial attack of rheumatic fever. The highest notification rates were among people living in Tairawhiti, Counties Manukau, and Northland DHBs (21.2, 14.7 and 10.8 per 100,000 respectively) (Figure 28).

The highest rates were recorded among children aged 10–14 years (25.0 per 100,000), followed by children aged 5–9 years (14.7 per 100,000).

Males had a higher notification rate (4.8 per 100,000) than females (3.5 per 100,000).

Ethnicity was recorded for all cases notified in 2014. The Pacific peoples (35.0 per 100,000) and Māori (12.3 per 100,000) ethnic groups had the highest rates of rheumatic fever (initial attacks) compared with other ethnic groups.

### Figure 28. Rheumatic fever (initial attack) cases by DHB, 2014




Hospitalisation status was recorded for 184 (99.5%) initial attack cases, of which 178 (96.7%) were hospitalised.

A total of 154 (83.2%) of the initial attack cases were confirmed cases. Of these, 142 (92.2%) were reported as having evidence of a preceding group A streptococcal infection.

A total of 139 (75.1%) cases occurred in school-aged children (5–17 years). Information on the schools attended was provided for 111 cases (79.9%).

The following analysis is for cases of recurrent rheumatic fever. The ages of the 20 recurrent rheumatic fever cases reported in 2014 ranged from 8 to 40 years. Eleven cases were male and nine were female. The Pacific peoples (11 cases) ethnic group had the highest number of recurrent rheumatic fever cases, followed by the Māori (8 cases) and European or Other (1 case) ethnic groups. Hospitalisation status was known for 19 cases and, of these, 18 (94.7%) were hospitalised.

Ministry of Health hospitalisation data for 2014 included 219 hospitalisations where rheumatic fever was the principal diagnosis.

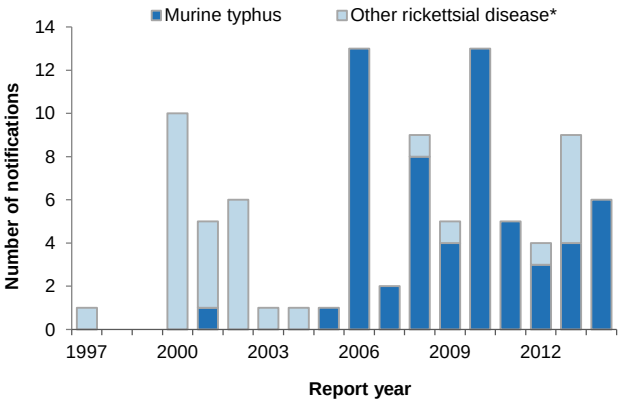
A full description of the epidemiology of rheumatic fever will be reported separately in the 2014/15 Rheumatic Fever Annual Report available from www.surv.esr.cri.nz.

## Rickettsial disease

This section includes murine typhus (*Rickettsia typhi)*, typhus (*Rickettsia prowazekii*) and other rickettsial diseases caused by organisms of the *Rickettsia* genus. For Q fever, see its separate section.

In 2014, six cases of rickettsial disease were notified compared with nine cases in 2013 (Figure 29). The 2014 notification rate (0.1 per 100,000) was slightly lower than the 2013 rate (0.2 per 100,000).

### Figure 29. Rickettsial disease notifications, 1997–2014




* Includes all other diseases caused by organisms of the *Rickettsia* genus, except typhus. No cases of typhus (caused by *Rickettsia prowazekii*) were reported between 1997 and 2014.

All six notifications were for murine typhus and were laboratory-confirmed. Cases were notified, from Waikato (4 cases), Counties Manukau and Northland (1 case each) DHBs.

The cases were in the 30–39 (3 cases), 50–59 (2 cases) and 60–69 years (1 case) age groups. All cases were male.

Cases were in the European or Other (4 cases) and Māori (2 cases) ethnic groups.

Hospitalisation status was recorded for all cases, of which five (83.3%) were hospitalised.

Five cases had not travelled overseas during the incubation period for the disease and are assumed to have acquired their infection in New Zealand. One case had travelled overseas.

## Rubella (German measles)

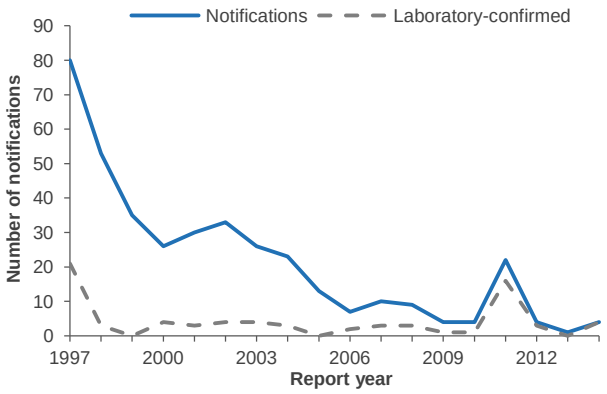
Rubella immunisation was introduced in 1970 for girls aged 11 years only and then extended to all children after MMR was introduced in 1990. Rubella has been a notifiable disease since June 1996.[20]

Four cases of rubella were notified in 2014, compared with one case in 2013. All four cases were laboratory-confirmed. Three cases were male and one was female. Cases were in the 15–19 (2 cases), 1–4 and 20–29 years (1 case each) age groups.

Hospitalisation status was recorded for all cases and none were hospitalised.

Since the last national rubella outbreak in 1995, the number of rubella cases notified each year [20] has decreased steadily, except for an increase in notifications in 2011 during the measles outbreak (Figure 30).

**Figure 30. Rubella notifications and laboratory-confirmed cases by year, 1997–2014**



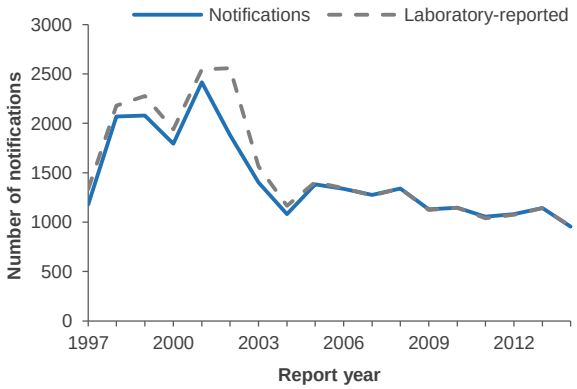

The recommended immunisation schedule for rubella is two doses of MMR vaccine, with the first given at age 15 months and the second at age four. [20] Immunisation status was known for the four cases, and none had been vaccinated, including one infant aged under 15 months who was ineligible for vaccination.

One outbreak of rubella involving three cases was reported in 2014.

## Salmonellosis

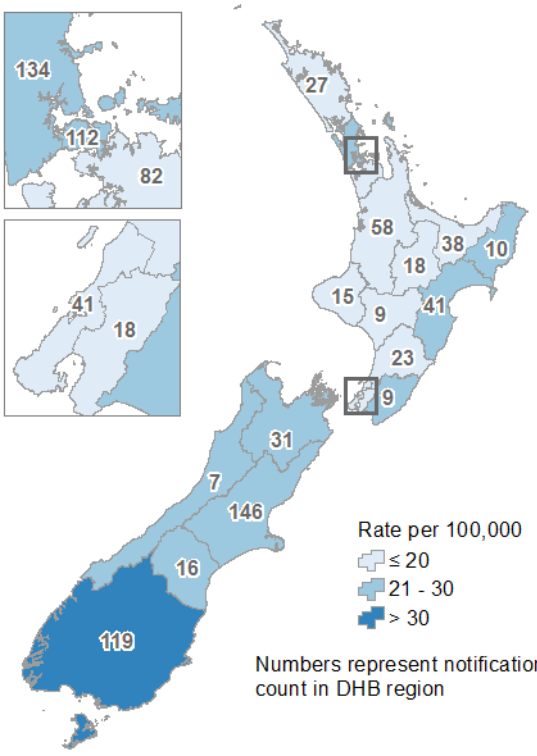
In 2014, 954 cases of salmonellosis were notified. The 2014 notification rate (21.2 per 100,000) showed a significant decrease from the 2013 rate (25.7 per 100,000, 1143 cases). Notifications for salmonellosis saw a large decrease between 2001 and 2004 and have remained relatively stable since 2005 (Figure 31).

**Figure 31. Salmonellosis notifications and laboratory-reported cases by year, 1997–2014**




The salmonellosis notification rate varied throughout the country (Figure 32). The highest rates were in Southern (38.4 per 100,000), Canterbury (28.4 per 100,000) and South Canterbury (27.5 per 100,000) DHBs.

**Figure 32. Salmonellosis notifications by DHB, 2014**




Notification rates were highest for infants aged under 1 year and children aged 1–4 years (79.8 and 68.0 per 100,000 respectively).

Females and males had a similar notification rate (21.2 and 21.1 per 100,000 respectively).

The highest notification rates were for the European or Other (21.9 per 100,000) and the Asian (16.8 per 100,000) ethnic groups.

Further information by DHB, sex, age and ethnic group is in Tables 31 to 35 in the Appendix.

Hospitalisation status was recorded for 630 (66.0%) cases, of which 104 (16.5%) were hospitalised.

The most common risk factors reported for salmonellosis in 2014 were consuming food at retail premises, travelling overseas and having contact with farm animals (Table 23).

The Enteric Reference Laboratory at ESR confirmed 958 isolates of *Salmonella* from humans (excluding *S.* Paratyphi and *S.* Typhi) in 2014. The most common serotypes identified were *S.* Typhimurium phage type 56 variant (72 isolates), *S.* Infantis (56 isolates), *S.* Typhimurium phage type 101 (41 isolates) and *S.* Enteritidis phage type 11 (39 isolates).

A summary of the laboratory-reported cases from 2010 to 2014 for selected *Salmonella* serotypes and phage types is provided in Table 36 in the Appendix.

The yearly trend for selected *Salmonella* serotypes is shown in Figure 33. Between 2010 and 2014, the number of cases of *S.* Stanley, *S.* Mississippi and *S.* Weltevreden noticeably increased. Serotypes with a decreasing trend in the last five years include *S.* Typhimurium phage type 160, *S.* Typhimurium phage type 156 and *S.* Typhimurium phage type 1.

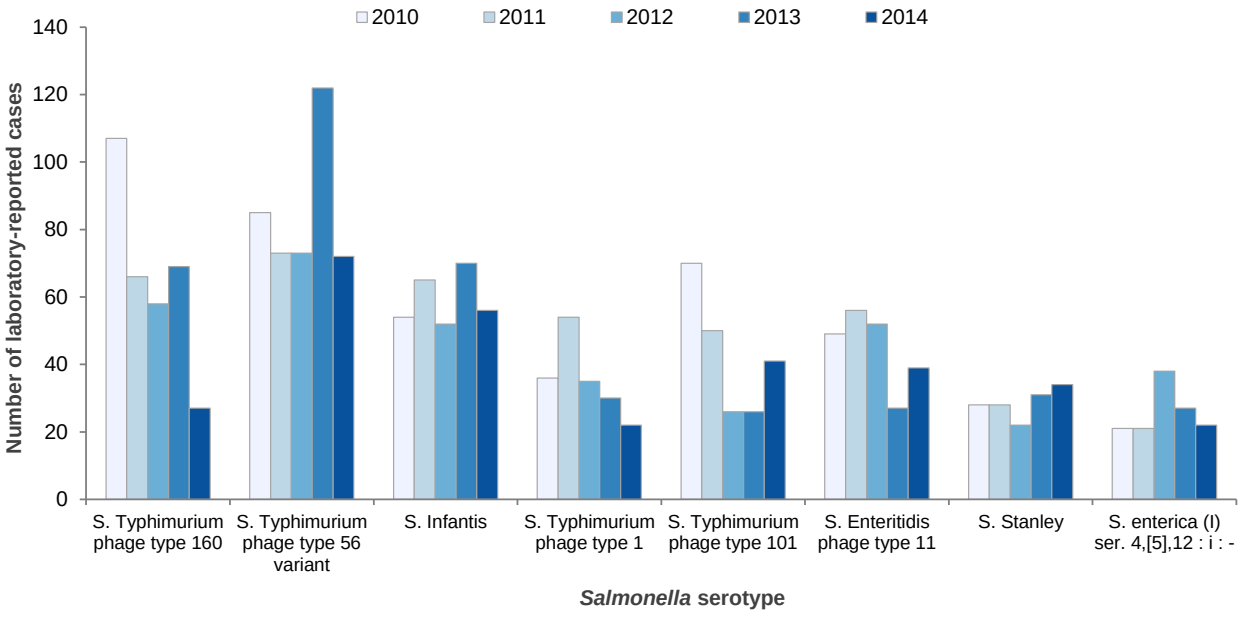
In 2014, 23 outbreaks of salmonellosis were reported, involving 116 cases.

**Table 23. Exposure to risk factors associated with salmonellosis, 2014**

| Risk factor | Yes | No | Unknown | Percentage (%) [a] |
|---|---|---|---|---|
| Consumed food from retail premises | 220 | 213 | 521 | 50.8 |
| Travelled overseas during the incubation period | 192 | 361 | 401 | 34.7 |
| Contact with farm animals | 132 | 308 | 514 | 30.0 |
| Recreational water contact | 99 | 337 | 518 | 22.7 |
| Consumed untreated water | 86 | 296 | 572 | 22.5 |
| Contact with faecal matter | 82 | 344 | 528 | 19.2 |
| Contact with other symptomatic people | 73 | 358 | 523 | 16.9 |
| Contact with sick animals | 24 | 382 | 548 | 5.9 |

[a] Percentage refers to the number of cases that answered "yes" out of the total number of cases for which this information was supplied. Some cases had more than one risk factor recorded.

**Figure 33. Laboratory-reported cases of selected *Salmonella* serotypes and phage types by year, 2010–2014**



## Severe acute respiratory syndrome

No cases of SARS have been reported in New Zealand since 2003.

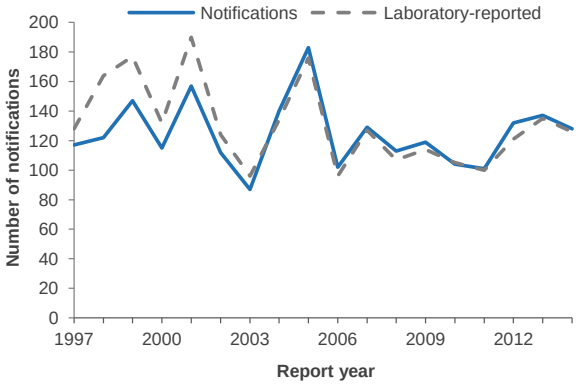
## Shigellosis

In 2014, 128 cases of shigellosis were notified compared with 137 in 2013. The 2014 notification rate (2.8 per 100,000) was slightly lower than the 2013 rate (3.1 per 100,000). After a peak of 183 cases in 2005, the yearly total cases from 2006 to 2014 have ranged from 101 to 137 (Figure 34).

Counties Manukau, Auckland and Southern DHBs had the highest notification rates (6.5, 6.1 and 3.2 per 100,000 respectively).

The highest notification rate was in the 1–4 years age group (4.0 per 100,000), followed by the 20–29 and 40–49 years (both 3.4 per 100,000) age groups.

**Figure 34. Shigellosis notifications and laboratory-reported cases by year, 1997–2014**




Males (3.4 per 100,000) had a higher rate than females (2.3 per 100,000).

Ethnicity was recorded for 118 (92.2%) cases. The Pacific peoples ethnic group had the highest notification rate (10.5 per 100,000), followed by the Asian (3.3 per 100,000) ethnic group.

Further information by DHB, sex, age and ethnic group is in Tables 31 to 35 in the Appendix.

Hospitalisation status was recorded for 69 (53.9%) cases, of which 20 (29.0%) were hospitalised. One death due to shigellosis was reported in 2014. The case was in the 70 years and over age group.

The risk factors recorded for shigellosis are shown in Table 24.

Of the 118 cases where travel information was reported, 72 (61.0%) had lived or travelled overseas during the incubation period for the disease. One further case had a prior history of travel. The countries most commonly lived in or visited were India (19 cases), Samoa (10 cases) and Australia (7 cases). Some cases reported travel to more than one country.

The Enteric Reference Laboratory at ESR confirmed 126 isolates as *Shigella* during 2014. The most common species identified were *S. sonnei* (74 isolates, 58.7%) and *S. flexneri* (41 isolates, 32.5%). The most common *S. sonnei* biotypes identified were biotype g (36 isolates, 48.6%) and biotype a (32 isolates, 43.2%).

Eleven outbreaks of shigellosis involving 71 cases were reported in 2014.

## Taeniasis

Five cases of taeniasis were notified in 2014 (0.1 per 100,000), bringing the number of cases notified since 1997 to 43.

All five cases were overseas during the incubation period for the disease. Countries lived in or visited were Ethiopia (2 cases), Laos (2 cases) and Vietnam (1 case).

Of the 43 cases notified since 1997, 42 (97.7%) reported a history of travelling overseas. The other case had an unknown travel history.

## Tetanus

No cases of tetanus were notified in New Zealand in 2014.

Between 1997 and 2014, a total of 31 tetanus cases were reported. Of these, four were children aged under 10 years. None were vaccinated. Of the 31 cases, two females aged over 70 years died from tetanus (one was not vaccinated and the vaccination status of the other was unknown).

Ministry of Health hospitalisation data for 2014 included one hospitalisation with tetanus as the principal diagnosis in 2014.

**Table 24. Exposure to risk factors associated with shigellosis, 2014**

| Risk factor | Yes | No | Unknown | Percentage (%) [a] |
|---|---|---|---|---|
| Travelled overseas during the incubation period | 72 | 46 | 10 | 61.0 |
| Contact with faecal matter | 10 | 21 | 97 | 32.3 |
| Contact with other symptomatic people | 10 | 26 | 92 | 27.8 |
| Consumed food from retail premises | 7 | 19 | 102 | 26.9 |
| Contact with farm animals | 6 | 28 | 94 | 17.6 |
| Recreational water contact | 5 | 26 | 97 | 16.1 |
| Consumed untreated water | 3 | 22 | 103 | 12.0 |
| Contact with sick animals | 1 | 30 | 97 | 3.2 |

[a] Percentage refers to the number of cases that answered "yes" out of the total number of cases for which this information was supplied. Some cases had more than one risk factor recorded.

## Trichinellosis

No cases of trichinellosis were notified in 2014.

Trichinellosis was added to the notifiable diseases schedule in 1988. Since then three cases have been reported, the most recent in 2001.[29]

Ministry of Health hospitalisation data for 2014 included one hospitalisation with trichinellosis as the principal diagnosis.

## Tuberculosis disease

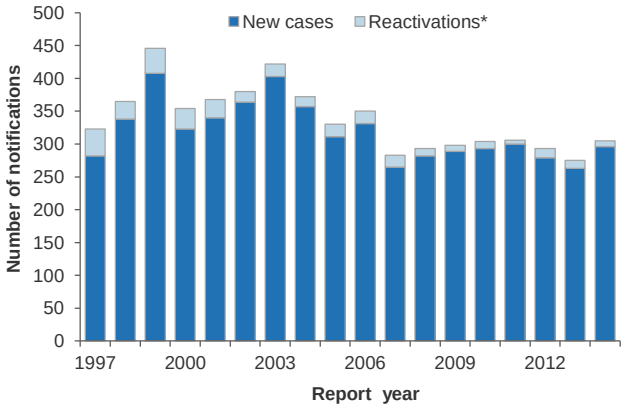
A full description of the epidemiology of tuberculosis and data on antimicrobial drug-resistant tuberculosis in New Zealand for 2014 will be reported separately in the report titled 'Tuberculosis in New Zealand: Annual Report 2014' available at www.surv.esr.cri.nz in September 2015.

In 2014, a total of 305 cases of tuberculosis disease were notified, including 296 (97.0%) new cases and nine (3.0%) reactivations.* Figure 35 shows the total number of new tuberculosis cases and reactivations reported since 1997. The overall rate in 2014 was 6.8 per 100,000, a slight increase from 6.2 per 100,000 in 2013. The rate of tuberculosis disease has remained at 6.2–7.0 cases per 100,000 for the last five years.

In 2014, laboratory information was available for 290 (95.1%) cases. Of these, 263 (90.7%) cases were reported as laboratory-confirmed.

In 2014, three outbreaks of tuberculosis were reported, involving 18 cases.

**Figure 35. Tuberculosis notifications (new cases and reactivations) by year, 1997–2014**




### Tuberculosis disease - new cases

In 2014, the rates of new tuberculosis notifications varied by geographical region (Figure 36). Auckland DHB had the highest notification rate (14.6 per 100,000), followed by Capital & Coast (12.1 per 100,000) and Counties Manukau (9.4 per 100,000) DHBs.

Tuberculosis rates were highest for adults in the 20–29 (11.5 per 100,000), 30–39 years (11.1 per 100,000) and 70 years and over (7.6 per 100,000) age groups. Twelve were children aged under five years.

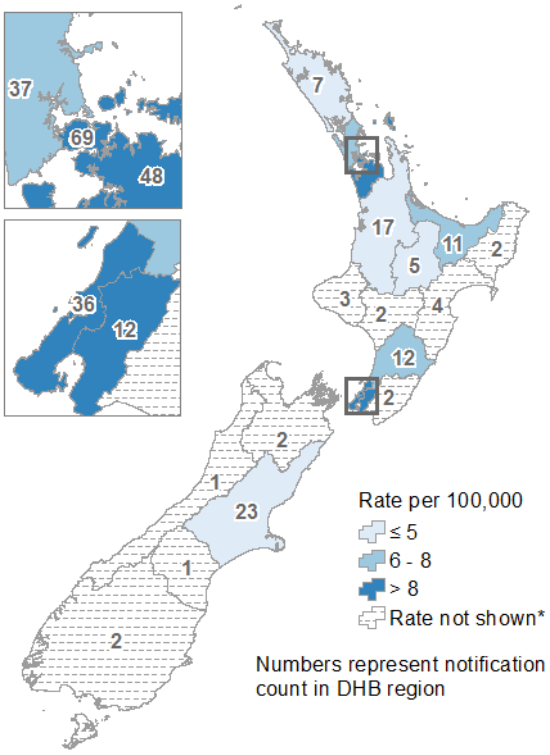
Males had a higher notification rate (7.8 per 100,000) than females (5.4 per 100,000).

The Asian ethnic group had the highest notification rate for tuberculosis (34.2 per 100,000), followed by MELAA (24.1 per 100,000) and Pacific peoples (16.9 per 100,000) ethnic groups.

Further information on DHB, sex, age and ethnic group is in Tables 31 to 35 in the Appendix.

Hospitalisation status was recorded for 284 (95.9%) new tuberculosis disease cases in 2014, of which 171 (60.2%) were hospitalised. Four deaths due to tuberculosis were reported among the 60–69 years and 70 years and over age groups (2 cases each).

**Figure 36. Tuberculosis notifications (new cases) by DHB, 2014**




Bacillus Calmette-Guérin (BCG) vaccination status was recorded for 152 (51.4%) cases, of which 110 (72.4%) had been vaccinated. Of the 12 children aged under five years, two were reported as having received the BCG vaccine, six had not been vaccinated and the vaccination status was unknown for four cases. One child aged under five years was reported as having meningeal tuberculosis and had not received BCG vaccine.

* The term 'reactivation' refers to cases with second or subsequent episodes of tuberculosis disease.

The majority of cases (224/293, 76.5%) for whom information was available were born overseas. Among the 69 cases born in New Zealand, 16 had been or were presently living with a person born outside New Zealand.

A total of 81 (33.2%) new tuberculosis cases reported contact with a confirmed case of tuberculosis.

Ministry of Health hospitalisation data for 2014 included 289 hospitalisations where tuberculosis was the principal diagnosis.

### Tuberculosis disease - reactivation/relapse cases

The nine tuberculosis reactivation or relapse cases reported in 2014 were from six DHBs: Counties Manukau, MidCentral, and Canterbury (2 cases each), Bay of Plenty, Taranaki, and Capital & Coast (1 case each). Those experiencing reactivated or relapsed tuberculosis were all aged 20 years and over, with the highest number in the 70 years and over age group (3 cases).

The Asian ethnic group (4 cases) had the highest number of cases, followed by the Pacific peoples and European or Other (2 cases each) and MELAA (1 case).

Eight of the nine cases with reactivated/relapse tuberculosis were born overseas, of which five cases were diagnosed with previous disease overseas and three in New Zealand. The remaining case was born and diagnosed with previous disease in New Zealand. Treatment status was recorded for eight cases, of which seven had been treated previously for the disease.

Hospitalisation status was recorded for all reactivation cases, of which six were hospitalised. No deaths were reported among the reactivation cases.

Of the four cases where BCG vaccination status was recorded, three had been vaccinated.

## Typhoid fever

In 2014, 42 cases of typhoid fever were notified compared with 50 cases in 2013. The 2014 notification rate (0.9 per 100,000) was slightly lower than the 2013 rate (1.1 per 100,000). Figure 37 shows the increasing trend in the number of typhoid fever notifications since 1997.

Counties Manukau (2.9 per 100,000) and Auckland (2.5 per 100,000) DHBs had the highest notification rates.

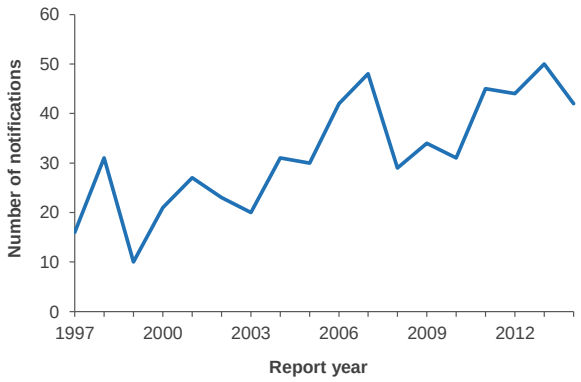
Notification rates were highest for the 20–29 (2.3 per 100,000), 15–19 (2.2 per 100,000) and 30–39 years (1.5 per 100,000) age groups.

Males (1.1 per 100,000) had a slightly higher rate than females (0.8 per 100,000).

Ethnicity was recorded for 41 (97.6%) cases. The Pacific peoples (5.4 per 100,000) and Asian (4.1 per 100,000) ethnic groups had the highest notification rates.

Hospitalisation status was recorded for 33 (78.6%) cases, of which 28 (84.8%) were hospitalised.

**Figure 37. Typhoid fever notifications by year, 1997–2014**




Of the 42 cases notified in 2014, 33 (78.6%) cases had lived or travelled overseas during the incubation period for the disease. The countries most commonly lived in or visited were India (21 cases), Samoa (5 cases) and Australia (2 cases). Some cases reported travelling to more than one country.

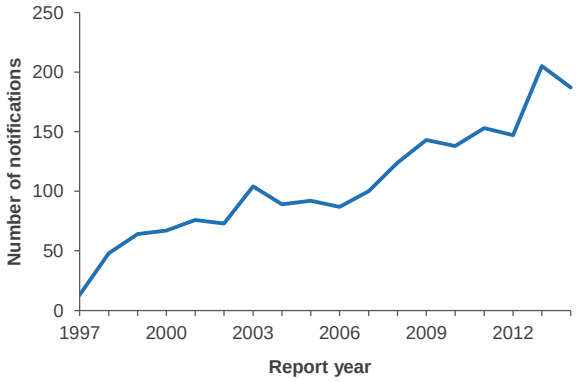
The Enteric Reference Laboratory at ESR confirmed 43 isolates as *Salmonella* Typhi during 2014. The most common phage types identified were *S.* Typhi phage type E1a (10 isolates) and *S.* Typhi phage type E7 variant (4 isolates).

One outbreak of typhoid fever involving two cases was reported in 2014.

## Verotoxin- or Shiga toxin-producing *Escherichia coli* infection

In 2014, 187 cases of verocytotoxin- or Shiga toxin-producing *Escherichia coli* (VTEC/STEC) infection were notified. The 2014 notification rate (4.1 per 100,000) was a decrease from the 2013 rate (4.6 per 100,000, 205 cases). The number of notifications of VTEC/STEC infection has been increasing since 1997 (Figure 38). This may be partly due to changes in laboratory testing practices, with increasingly sensitive assays and algorithms used for the detection of VTEC/STEC.

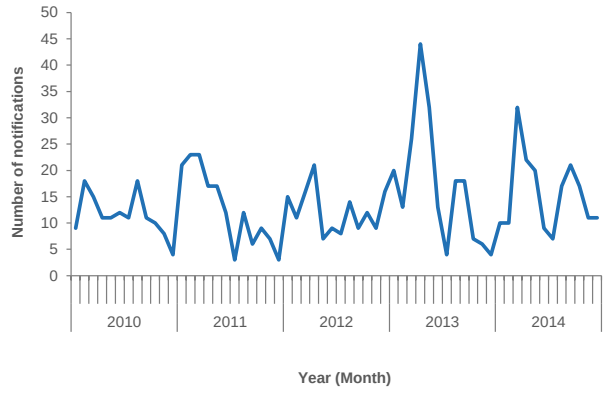
### Figure 38. VTEC/STEC notifications by year, 1997–2014




Fourteen paediatric cases of haemolytic uraemic syndrome (HUS) were reported to the New Zealand Paediatric Surveillance Unit (NZPSU) in 2014. Six cases were confirmed to be VTEC/STEC-associated.

VTEC/STEC infection notifications follow a seasonal pattern, with peaks occurring during autumn and spring each year (Figure 39). The highest monthly total for 2014 occurred in March, when 32 cases were notified, including 15 cases that were part of four outbreaks.

### Figure 39. VTEC/STEC infection notifications by month, January 2010–December 2014




The rate for VTEC/STEC infection notifications varied throughout the country, with the highest rates in Waikato, Northland and Taranaki DHBs (10.2, 6.6 and 6.1 per 100,000 respectively) (Figure 40).

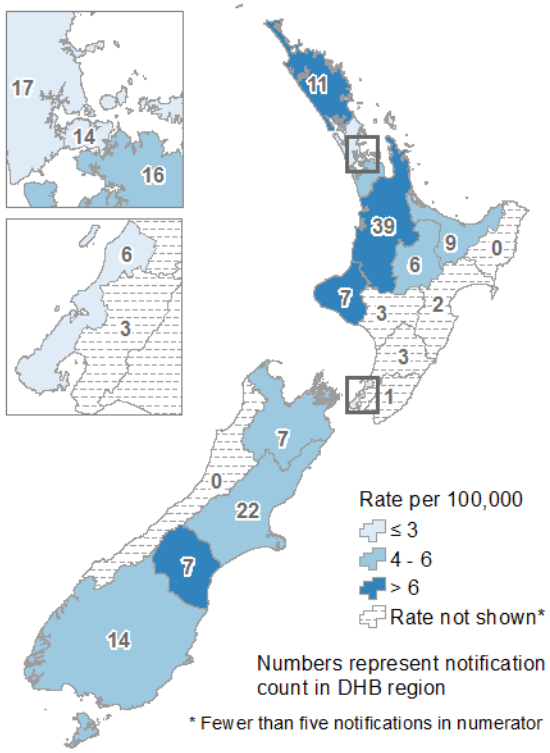
Children aged 1–4 years had the highest notification rate (28.8 per 100,000, 72 cases), followed by children aged under 1 year (18.7 per 100,000, 11 cases).

Females had a higher notification rate (4.7 per 100,000) than males (3.6 per 100,000).

The European or Other ethnic group had the highest notification rate (4.9 per 100,000, 148 cases), followed by the Māori (3.0 per 100,000) ethnic group.

Further information regarding DHB, sex, age and ethnic group is in Tables 31 to 35 in the Appendix.

### Figure 40. VTEC/STEC infection notifications by DHB, 2014




Hospitalisation status was recorded for 158 (84.5%) cases, of which 53 (33.5%) were hospitalised. Of the 53 hospitalised cases, six had HUS. One death due to VTEC/STEC infection was reported in 2014.

The most common risk factors reported for VTEC/STEC infection cases in 2014 were contact with pets, farm animals and animal manure, as shown in Table 25.

The most common foods that the cases consumed during the incubation period were dairy products, raw fruit or vegetables and chicken or poultry products (Table 26).

The Enteric Reference Laboratory at ESR confirmed 193 isolates of VTEC/STEC in 2014. Of these, 170 (88.1%) were identified as serotype O157:H7 and 21 (10.2%) as non-O157 serotypes. The serotype was undetermined in two cases, but verocytotoxin was detected by PCR.

In 2014, ten outbreaks of VTEC/STEC infection were reported involving 35 cases.

**Table 25. Exposure to risk factors associated with VTEC/STEC infection, 2014**

| Risk factor | Yes | No | Unknown | Percentage (%)[a] |
|---|---|---|---|---|
| Contact with pets | 73 | 13 | 101 | 84.9 |
| Contact with farm animals | 62 | 22 | 103 | 73.8 |
| Contact with animal manure | 28 | 34 | 125 | 45.2 |
| Contact with children in nappies | 38 | 77 | 72 | 33.0 |
| Contact with recreational water | 35 | 93 | 59 | 27.3 |
| Contact with a person with similar symptoms | 32 | 95 | 60 | 25.2 |
| Contact with other animals | 15 | 52 | 120 | 22.4 |
| Travelled overseas during the incubation period | 9 | 134 | 44 | 6.3 |

[a] Percentage refers to the number of cases that answered "yes" out of the total number of cases for which this information was supplied. Some cases had more than one risk factor recorded.

**Table 26. Foods consumed by VTEC/STEC infection cases, 2014**

| Foods consumed | Yes | No | Unknown | Percentage (%)[a] |
|---|---|---|---|---|
| Dairy products | 104 | 16 | 67 | 86.7 |
| Raw fruit or vegetables | 106 | 18 | 63 | 85.5 |
| Chicken or poultry products | 84 | 28 | 75 | 75.0 |
| Beef or beef products | 82 | 31 | 74 | 72.6 |
| Processed meat | 62 | 53 | 72 | 53.9 |
| Fruit or vegetable juice | 39 | 66 | 82 | 37.1 |
| Home kill meat | 39 | 74 | 74 | 34.5 |
| Lamb or hogget or mutton | 28 | 77 | 82 | 26.7 |
| Unpasteurised milk or milk products | 22 | 102 | 63 | 17.7 |
| Pink or undercooked meat | 14 | 98 | 75 | 12.5 |

[a] Percentage refers to the number of cases that answered "yes" out of the total number of cases for which this information was supplied.

## Viral haemorrhagic fevers

No cases of viral haemorrhagic fever (including Ebola) have ever been reported in New Zealand.[30]

## Yellow fever

No cases of yellow fever have been notified in New Zealand since at least 1996.

## Yersiniosis

In 2014, 682 cases of yersiniosis were notified. The 2014 notification rate (15.1 per 100,000) was a significant increase from the 2013 rate (10.9 per 100,000, 484 cases). A large outbreak of *Yersinia pseudotuberculosis* was reported in 2014, involving 220 cases. This serotype usually accounts for less than 1% of laboratory-confirmed cases per year.

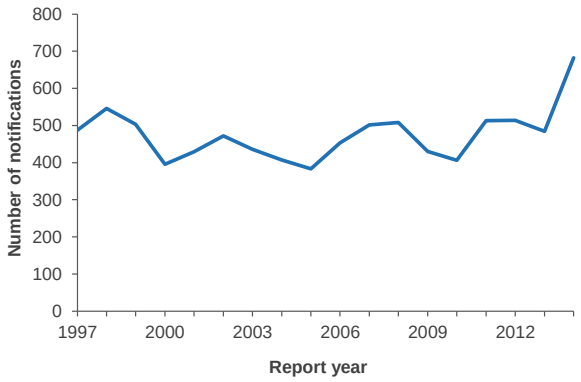
Figure 41 shows the number of notified yersiniosis cases by year since 1997.

Canterbury, Lakes and Capital & Coast DHBs had the highest notification rates (35.4, 25.1 and 21.9 per 100,000 respectively) (Figure 42).

Infants aged under 1 year and children aged 1–4 years had the highest notification rates (47.5 and 41.6 per 100,000 respectively).

Males (15.5 per 100,000) had a slightly higher rate than females (14.8 per 100,000).

**Figure 41. Yersiniosis notifications by year, 1997–2014**

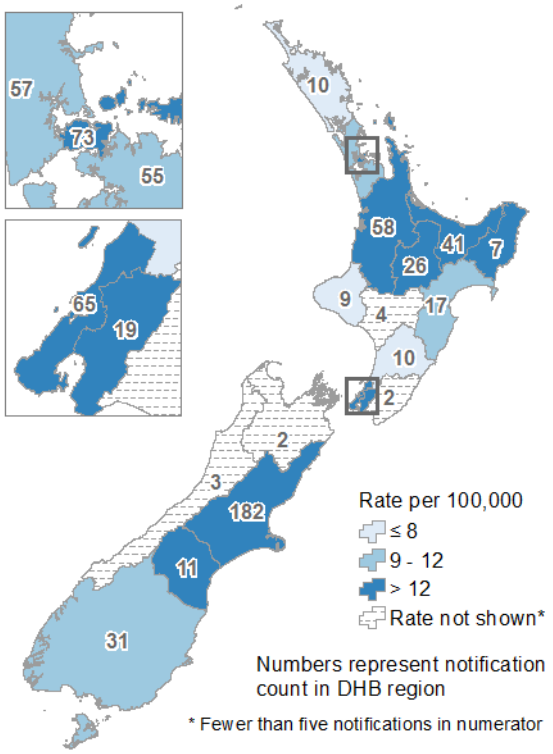



Ethnicity was recorded for 659 (96.6%) cases. The Asian (25.1 per 100,000) and MELAA (16.1 per 100,000) ethnic groups had the highest notification rates.

Further information by DHB, sex, age and ethnic group is in Tables 31 to 35 in the Appendix.

Hospitalisation status was recorded for 536 (78.6%) cases, of which 119 (22.2%) were hospitalised.

### Figure 42. Yersiniosis notifications by DHB, 2014




The risk factors recorded for yersiniosis cases are shown in Table 27. The most common risk factors reported were consuming food from retail premises and coming into contact with faecal matter.

The Enteric Reference Laboratory at ESR confirmed 383 isolates as *Yersinia enterocolitica* and 181 isolates as *Y. pseudotuberculosis* during 2014. The most common *Y. enterocolitica* biotype identified was biotype 2 (118 isolates, 30.8%), followed by biotype 1A (103 isolates, 26.9%), biotype 4 (97 isolates, 25.3%), biotype 3 (64 isolates, 16.7%) and biotype 1B (1 isolate, 0.3%).

In addition to the large *Y. pseudotuberculosis* outbreak (220 cases), six outbreaks due to *Y. enterocolitica* were reported in 2014 involving 26 cases.

### Table 27. Exposure to risk factors associated with yersiniosis, 2014

| Risk factor | Yes | No | Unknown | Percentage (%) [a] |
|---|---|---|---|---|
| Consumed food from retail premises | 239 | 129 | 314 | 64.9 |
| Contact with faecal matter | 83 | 255 | 344 | 24.6 |
| Contact with farm animals | 84 | 288 | 310 | 22.6 |
| Recreational water contact | 70 | 286 | 326 | 19.7 |
| Consumed untreated water | 51 | 251 | 380 | 16.9 |
| Contact with other symptomatic people | 53 | 280 | 349 | 15.9 |
| Travelled overseas during the incubation period | 30 | 346 | 306 | 8.0 |
| Contact with sick animals | 13 | 328 | 341 | 3.8 |

[a] Percentage refers to the number of cases that answered "yes" out of the total number of cases for which this information was supplied. Some cases had more than one risk factor recorded.

# APPENDIX: NATIONAL DATA AND TRENDS

E/S/R

THE SCIENCE BEHIND THE TRUTH

# APPENDIX: NATIONAL DATA AND TRENDS

## Comparison of notifiable disease cases and rates for 2014 and 2013

### Table 28. Numbers of cases for rare (fewer than 10 cases reported in a single year) notifiable diseases in New Zealand, 2014 and 2013

| Disease[a] | 2014 | 2013 |
|---|---|---|
| Botulism | 1 | 0 |
| Brucellosis | 0 | 1 |
| Chikungunya fever | 44 | 1 |
| Creutzfeldt-Jakob disease[b] | 6 | 6 |
| *Cronobacter* species | 0 | 1 |
| Cysticercosis | 1 | 1 |
| Decompression sickness | 0 | 2 |
| Diphtheria | 2 | 0 |
| *Haemophilus influenzae* type b | 5 | 2 |
| Hepatitis NOS | 8 | 2 |
| Hydatid disease | 4 | 7 |
| Leprosy | 4 | 11 |
| Rickettsial disease | 6 | 9 |
| Ross River virus infection | 1 | 3 |
| Rubella | 4 | 1 |
| Taeniasis | 5 | 6 |
| Tetanus | 0 | 1 |
| Zika virus | 57 | 0 |

[a] No cases of the following notifiable diseases were reported in 2014 or 2013: anthrax, Barmah Forest virus infection, cholera, congenital rubella, highly pathogenic avian influenza, Middle East respiratory syndrome (MERS), non-seasonal influenza, plague, poliomyelitis, primary amoebic meningo-encephalitis, Q fever, rabies, severe acute respiratory syndrome (SARS), trichinosis, viral haemorrhagic fever and yellow fever.

[b] Creutzfeldt-Jakob disease data is provided by the National CJD Registry, University of Otago.

## Deaths due to notifiable diseases, as recorded in EpiSurv, 1997–2014

### Table 29. Deaths due to notifiable diseases, as recorded in EpiSurv, 1997–2014

| Disease | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AIDS [a] | 34 | 19 | 18 | 19 | 14 | 11 | 10 | 13 | 15 | 14 | 5 | 2 | 2 | 8 | 1 | 3 | 6 | 3 |
| Campylobacteriosis | 2 | 2 | 1 | 3 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Creutzfeldt-Jakob disease[b] | 3 | 0 | 2 | 3 | 1 | 3 | 4 | 3 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 8 | 6 | 6 |
| Gastroenteritis[c] | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Giardiasis | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Haemophilus influenzae* type b | 1 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| Hepatitis B | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Hydatid disease | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Invasive pneumococcal disease[d] | | | | | | | | | | | | 8 | 35 | 27 | 32 | 32 | 18 | 22 |
| Legionellosis[e] | 4 | 1 | 1 | 5 | 2 | 3 | 1 | 1 | 4 | 3 | 1 | 4 | 2 | 5 | 4 | 6 | 3 | 1 |
| Listeriosis - non-perinatal | 2 | 0 | 1 | 2 | 1 | 0 | 2 | 3 | 1 | 0 | 2 | 3 | 2 | 3 | 1 | 4 | 2 | 3 |
| Listeriosis - perinatal | 6 | 0 | 2 | 4 | 1 | 3 | 2 | 2 | 4 | 1 | 2 | 2 | 2 | 4 | 0 | 2 | 3 | 2 |
| Malaria | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Meningococcal disease | 24 | 23 | 23 | 17 | 26 | 18 | 13 | 8 | 14 | 7 | 7 | 8 | 5 | 6 | 13 | 6 | 4 | 3 |
| Non seasonal influenza A (H1N1)[f] | | | | | | | | | | | | | 36 | 17 | 0 | 0 | 0 | 0 |
| Pertussis | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 |
| Primary amoebic meningoencephalitis | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rheumatic fever | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Salmonellosis | 2 | 2 | 1 | 7 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Shigellosis | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Tetanus | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Tuberculosis disease | 15 | 8 | 14 | 8 | 2 | 6 | 6 | 6 | 4 | 6 | 3 | 4 | 4 | 9 | 3 | 5 | 2 | 4 |
| VTEC/STEC infection | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Yersiniosis | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

[a] Data source: AIDS Epidemiology Group. [1]

[b] Data source: CJD Registry. [18]

[c] Cases of acute gastroenteritis from a common source or foodborne intoxication, eg, staphylococcal intoxication.

[d] Invasive pneumococcal disease became notifiable on 17 October 2008.

[e] One further legionellosis death occurred in a laboratory-reported but non-notified case in 2002.

[f] Non-seasonal influenza became notifiable on 26 April 2009. Deaths recorded in 2009 and 2010 were due to influenza A(H1N1)pdm09. Influenza A(H1N1)pdm09 virus was re-classified as seasonal influenza from 1 January 2011.

Note: The numbers in this table are those recorded in EpiSurv where the notifiable disease was the primary cause of death. Information on a death is most likely to be reported by public health services when it occurs close to the time of notification and investigation.

## Morbidity data for selected notifiable diseases, 2012–2014 (Ministry of Health)

### Table 30. Hospital admissions for selected notifiable diseases, 2012–2014

| Disease | ICD 10 codes | 2012 | | 2013 | | 2014 | |
|---|---|---|---|---|---|---|---|
| | | Prin [a] | Oth [b] | Prin [a] | Oth [b] | Prin [a] | Oth [b] |
| AIDS | B20-B24 | 7 | 259 | 7 | 266 | 10 | 254 |
| Arboviral diseases | A83, A84, A85.2, A92, A93, A94, B33.1 | 1 | 1 | 1 | | 16 | 1 |
| Brucellosis | A23 | | | 1 | | | |
| Campylobacteriosis | A04.5 | 548 | 117 | 591 | 128 | 606 | 111 |
| Cholera | A00 | | | | | | |
| Creutzfeldt-Jakob disease | A81.0 | 8 | 3 | 5 | | 8 | 3 |
| Cryptosporidiosis | A07.2 | 42 | 12 | 38 | 21 | 22 | 4 |
| Cysticercosis | B69 | | 3 | 2 | 2 | 1 | |
| Decompression sickness | T70.3 | 33 | 1 | 42 | 7 | 22 | 2 |
| Dengue fever | A90, A91 | 16 | | 35 | 1 | 66 | 2 |
| Diphtheria | A36 | | 1 | 1 | | 1 | 1 |
| Giardiasis | A07.1 | 27 | 23 | 24 | 23 | 42 | 25 |
| Hepatitis A | B15 | 35 | 4 | 29 | 10 | 33 | 16 |
| Hepatitis B | B16 | 24 | 27 | 18 | 26 | 25 | 30 |
| Hepatitis C | B17.1 | 21 | 32 | 18 | 38 | 10 | 26 |
| Hydatid disease | B67 | 8 | 5 | 5 | 10 | 8 | 14 |
| Legionellosis | A48.1 | 69 | 15 | 79 | 10 | 50 | 27 |
| Leprosy | A30 | 1 | 1 | | 3 | 2 | 1 |
| Leptospirosis | A27 | 69 | 12 | 47 | 5 | 33 | 10 |
| Listeriosis | A32 | 14 | 14 | 13 | 11 | 14 | 13 |
| Malaria | B50-B54 | 28 | | 42 | 3 | 24 | |
| Measles | B05 | 19 | | 4 | 1 | 65 | 9 |
| Meningococcal disease | A39 | 93 | 28 | 69 | 16 | 50 | 16 |
| Mumps | B26 | 9 | 5 | 7 | 2 | 16 | 2 |
| Paratyphoid | A01.1-A01.4 | 6 | | 11 | | 5 | |
| Pertussis | A37 | 402 | 77 | 272 | 63 | 111 | 34 |
| Q fever | A78 | | | | | | |
| Rheumatic fever | I00, I01, I02 | 231 | 36 | 291 | 37 | 219 | 32 |
| Rickettsial diseases | A75, A77, A79 | 2 | | 6 | | 4 | |
| Rubella | B06 | 2 | | | 2 | 1 | 1 |
| Salmonellosis | A02 | 129 | 47 | 126 | 40 | 110 | 40 |
| Shigellosis | A03 | 12 | 8 | 26 | 3 | 12 | 6 |
| Taeniasis | B689 | | | | 1 | | |
| Tetanus | A33-A35 | 5 | 4 | 4 | 2 | 1 | |
| Tuberculosis | A15-A19, P37.0 | 212 | 112 | 199 | 118 | 289 | 134 |
| Typhoid | A01.0 | 48 | 5 | 47 | 3 | 37 | |
| Viral haemorrhagic fevers | A95, A98, A99 | | | | | | |
| VTEC/STEC infection | A04.0-A04.4 | 56 | 23 | 46 | 50 | 52 | 34 |
| Yellow fever | A95 | | | | | | |
| Yersiniosis | A04.6 | 19 | 25 | 29 | 18 | 26 | 24 |

[a] Principal diagnosis.
[b] Other relevant diagnosis.
Note: Hospital admission data may include multiple admissions (to the same or different hospitals) for the same case, and admissions may relate to cases first diagnosed in previous years.

## Notifiable disease cases and rates by District Health Board, 2014

### Table 31. Number of cases and rate per 100,000 population of notifiable diseases by DHB, 2014

| Disease | District Health Board [a] | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Northland | | Waitemata | | Auckland | | Counties Manukau | | Waikato | | Lakes | | Bay of Plenty | | Tairawhiti | | Taranaki | | Hawke's Bay | |
| | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate |
| Campylobacteriosis | 248 | 149.4 | 754 | 134.0 | 587 | 124.4 | 517 | 101.5 | 764 | 199.2 | 173 | 167.0 | 327 | 150.4 | 73 | 155.0 | 170 | 147.8 | 294 | 184.4 |
| Cryptosporidiosis | 31 | 18.7 | 54 | 9.6 | 33 | 7.0 | 31 | 6.1 | 81 | 21.1 | 14 | 13.5 | 23 | 10.6 | 5 | 10.6 | 19 | 16.5 | 25 | 15.7 |
| Dengue fever | 3 | | 32 | 5.7 | 46 | 9.7 | 39 | 7.7 | 8 | 2.1 | 2 | | 15 | 6.9 | | | | | 2 | |
| Gastroenteritis[b] | 2 | | 63 | 11.2 | 85 | 18.0 | 45 | 8.8 | 15 | 3.9 | 13 | 12.5 | 19 | 8.7 | | | 5 | 4.3 | | |
| Giardiasis | 57 | 34.3 | 217 | 38.6 | 196 | 41.5 | 167 | 32.8 | 171 | 44.6 | 77 | 74.3 | 92 | 42.3 | 24 | 51.0 | 25 | 21.7 | 91 | 57.1 |
| Hepatitis A | 5 | 3.0 | 16 | 2.8 | 8 | 1.7 | 18 | 3.5 | 2 | | 1 | | 2 | | | | | | 3 | |
| Hepatitis B[c] | 1 | | 5 | 0.9 | 2 | | 3 | | 2 | | | | 2 | | 1 | | | | 2 | |
| Hepatitis C[c] | 5 | 3.0 | 1 | | 2 | | | | | | | | 1 | | | | 4 | | 2 | |
| Invasive pneumococcal disease | 26 | 15.7 | 47 | 8.4 | 57 | 12.1 | 79 | 15.5 | 43 | 11.2 | 27 | 26.1 | 32 | 14.7 | 7 | 14.9 | 14 | 12.2 | 17 | 10.7 |
| Legionellosis | 8 | 4.8 | 17 | 3.0 | 6 | 1.3 | 20 | 3.9 | 2 | | 1 | | 5 | 2.3 | | | 1 | | 1 | |
| Leptospirosis | 5 | 3.0 | 1 | | | | 2 | | 7 | 1.8 | 3 | | 2 | | | | 3 | | 15 | 9.4 |
| Listeriosis | 1 | | 2 | | 4 | | 7 | 1.4 | | | | | 3 | | | | | | | |
| Malaria | 1 | | 1 | | 11 | 2.3 | 5 | 1.0 | 3 | | 1 | | 1 | | | | 1 | | | |
| Measles | 6 | 3.6 | 63 | 11.2 | 21 | 4.5 | 28 | 5.5 | 125 | 32.6 | 9 | 8.7 | 4 | | 2 | | 4 | | 12 | 7.5 |
| Meningococcal disease | 3 | | 3 | | 3 | | 1 | | 5 | 1.3 | | | 3 | | 1 | | 1 | | 2 | |
| Mumps | | | 2 | | 3 | | 2 | | | | 1 | | 2 | | 1 | | | | 1 | |
| Paratyphoid fever | | | 4 | | 3 | | 4 | | 1 | | | | | | | | 1 | | | |
| Pertussis | 38 | 22.9 | 203 | 36.1 | 104 | 22.0 | 161 | 31.6 | 123 | 32.1 | 19 | 18.3 | 41 | 18.9 | 10 | 21.2 | 27 | 23.5 | 41 | 25.7 |
| Rheumatic fever[d] | 18 | 10.8 | 14 | 2.5 | 22 | 4.7 | 84 | 16.5 | 17 | 4.4 | 7 | 6.8 | 7 | 3.2 | 10 | 21.2 | | | 4 | |
| Salmonellosis | 27 | 16.3 | 134 | 23.8 | 112 | 23.7 | 82 | 16.1 | 58 | 15.1 | 18 | 17.4 | 38 | 17.5 | 10 | 21.2 | 15 | 13.0 | 41 | 25.7 |
| Shigellosis | 2 | | 14 | 2.5 | 29 | 6.1 | 33 | 6.5 | 8 | 2.1 | 2 | | 2 | | | | 3 | | 2 | |
| Tuberculosis disease | 7 | 4.2 | 37 | 6.6 | 69 | 14.6 | 50 | 9.8 | 17 | 4.4 | 5 | 4.8 | 12 | 5.5 | 2 | | 4 | | 4 | |
| Typhoid fever | | | 1 | | 12 | 2.5 | 15 | 2.9 | 1 | | | | 3 | | 1 | | | | 1 | |
| VTEC/STEC infection | 11 | 6.6 | 17 | 3.0 | 14 | 3.0 | 16 | 3.1 | 39 | 10.2 | 6 | 5.8 | 9 | 4.1 | | | 7 | 6.1 | 2 | |
| Yersiniosis | 10 | 6.0 | 57 | 10.1 | 73 | 15.5 | 55 | 10.8 | 58 | 15.1 | 26 | 25.1 | 41 | 18.9 | 7 | 14.9 | 9 | 7.8 | 17 | 10.7 |

[a] Table is continued on the following page.
[b] Cases of acute gastroenteritis from a common source or foodborne intoxication, eg, staphylococcal intoxication.
[c] Only acute cases of this disease are notifiable.
[d] Includes rheumatic fever initial attack and recurrent cases.
Note: For fewer than five cases notified, a rate is not calculated and the cell is blank.

## Notifiable disease cases and rates by District Health Board, 2014

### Table 31. Number of cases and rate per 100,000 population of notifiable diseases by DHB, 2014 (continued)

| Disease | District Health Board [a] | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Whanganui | | MidCentral | | Hutt Valley | | Capital & Coast | | Wairarapa | | Nelson Marlborough | | West Coast | | Canterbury | | South Canterbury | | Southern | |
| | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate |
| Campylobacteriosis | 88 | 141.5 | 259 | 152.1 | 211 | 147.1 | 543 | 183.0 | 61 | 142.5 | 194 | 135.6 | 61 | 186.0 | 738 | 143.4 | 155 | 266.8 | 559 | 180.4 |
| Cryptosporidiosis | 8 | 12.9 | 20 | 11.7 | 9 | 6.3 | 29 | 9.8 | 11 | 25.7 | 17 | 11.9 | 9 | 27.4 | 85 | 16.5 | 20 | 34.4 | 60 | 19.4 |
| Dengue fever | | | 1 | | 4 | | 7 | 2.4 | | | 1 | | | | 14 | 2.7 | 1 | | 4 | |
| Gastroenteritis[b] | 22 | 35.4 | 142 | 83.4 | 85 | 59.3 | 197 | 66.4 | 4 | | 6 | 4.2 | 4 | | 39 | 7.6 | 1 | | 8 | 2.6 |
| Giardiasis | 24 | 38.6 | 24 | 14.1 | 45 | 31.4 | 118 | 39.8 | 21 | 49.1 | 58 | 40.5 | 7 | 21.3 | 184 | 35.8 | 21 | 36.1 | 90 | 29.0 |
| Hepatitis A | 2 | | 2 | | 9 | 6.3 | 2 | | | | | | | | 3 | | 1 | | | |
| Hepatitis B[c] | | | | | 2 | | 1 | | | | 2 | | | | 8 | 1.6 | | | 4 | |
| Hepatitis C[c] | | | | | 1 | | 1 | | | | 2 | | | | 6 | 1.2 | | | 5 | 1.6 |
| Invasive pneumococcal disease | 10 | 16.1 | 21 | 12.3 | 13 | 9.1 | 30 | 10.1 | 6 | 14.0 | 6 | 4.2 | 1 | | 41 | 8.0 | 4 | | 27 | 8.7 |
| Legionellosis | | | 5 | 2.9 | 1 | | 2 | | | | 4 | | 6 | 18.3 | 40 | 7.8 | 1 | | 5 | 1.6 |
| Leptospirosis | 3 | | 4 | | | | | | 2 | | 1 | | 1 | | 2 | | | | 5 | 1.6 |
| Listeriosis | | | 3 | | | | 1 | | | | | | | | 1 | | | | 3 | |
| Malaria | | | | | 2 | | | | | | | | | | 6 | 1.2 | | | 1 | |
| Measles | | | | | | | 5 | 1.7 | | | | | | | 1 | | | | | |
| Meningococcal disease | | | 2 | | 1 | | 2 | | 1 | | 4 | | | | 6 | 1.2 | 3 | | 5 | 1.6 |
| Mumps | | | | | | | | | 1 | | 1 | | | | 5 | 1.0 | | | | |
| Paratyphoid fever | | | 1 | | 2 | | | | | | | | | | 3 | | | | 2 | |
| Pertussis | 1 | | 12 | 7.0 | 27 | 18.8 | 90 | 30.3 | 1 | | 62 | 43.3 | 4 | | 122 | 23.7 | 4 | | 37 | 11.9 |
| Rheumatic fever[d] | 1 | | 1 | | 4 | | 9 | 3.0 | 2 | | | | 1 | | 4 | | | | | |
| Salmonellosis | 9 | 14.5 | 23 | 13.5 | 18 | 12.6 | 41 | 13.8 | 9 | 21.0 | 31 | 21.7 | 7 | 21.3 | 146 | 28.4 | 16 | 27.5 | 119 | 38.4 |
| Shigellosis | | | 1 | | 2 | | 12 | 4.0 | | | | | | | 6 | 1.2 | 2 | | 10 | 3.2 |
| Tuberculosis disease | 2 | | 14 | 8.2 | 12 | 8.4 | 37 | 12.5 | 2 | | 2 | | 1 | | 25 | 4.9 | 1 | | 2 | |
| Typhoid fever | | | | | 1 | | 2 | | | | 1 | | | | 2 | | | | 2 | |
| VTEC/STEC infection | 3 | | 3 | | 3 | | 6 | 2.0 | 1 | | 7 | 4.9 | | | 22 | 4.3 | 7 | 12.0 | 14 | 4.5 |
| Yersiniosis | 4 | | 10 | 5.9 | 19 | 13.2 | 65 | 21.9 | 2 | | 2 | | 3 | | 182 | 35.4 | 11 | 18.9 | 31 | 10.0 |

[a] Table is continued from the previous page.
[b] Cases of acute gastroenteritis from a common source or foodborne intoxication, eg, staphylococcal intoxication.
[c] Only acute cases of this disease are notifiable.
[d] Includes rheumatic fever initial attack and recurrent cases.
Note: For fewer than five cases notified, a rate is not been calculated and the cell is blank.

## Notifiable disease cases and rates by sex, 2014

### Table 32. Number of cases and rate per 100,000 population of notifiable diseases by sex, 2014

| Disease | Sex | | | | | |
|---|---|---|---|---|---|---|
| | Male | | Female | | Total [a] | |
| | Cases | Rate | Cases | Rate | Cases | Rate |
| Campylobacteriosis | 3819 | 172.8 | 2952 | 128.3 | 6776 | 150.3 |
| Cryptosporidiosis | 274 | 12.4 | 310 | 13.5 | 584 | 12.9 |
| Dengue fever | 103 | 4.7 | 76 | 3.3 | 179 | 4.0 |
| Gastroenteritis (acute)[b] | 322 | 14.6 | 433 | 18.8 | 755 | 16.7 |
| Giardiasis | 876 | 39.6 | 833 | 36.2 | 1709 | 37.9 |
| Hepatitis A | 36 | 1.6 | 38 | 1.7 | 74 | 1.6 |
| Hepatitis B[c] | 24 | 1.1 | 11 | 0.5 | 35 | 0.8 |
| Hepatitis C[c] | 17 | 0.8 | 13 | 0.6 | 30 | 0.7 |
| Invasive pneumococcal disease | 271 | 12.3 | 237 | 10.3 | 508 | 11.3 |
| Legionellosis | 89 | 4.0 | 36 | 1.6 | 125 | 2.8 |
| Leptospirosis | 51 | 2.3 | 5 | 0.2 | 56 | 1.2 |
| Listeriosis | 12 | 0.5 | 13 | 0.6 | 25 | 0.6 |
| Malaria | 25 | 1.1 | 8 | 0.3 | 33 | 0.7 |
| Measles | 176 | 8.0 | 104 | 4.5 | 280 | 6.2 |
| Meningococcal disease | 24 | 1.1 | 22 | 1.0 | 46 | 1.0 |
| Mumps | 13 | 0.6 | 6 | 0.3 | 19 | 0.4 |
| Paratyphoid fever | 9 | 0.4 | 12 | 0.5 | 21 | 0.5 |
| Pertussis | 491 | 22.2 | 636 | 27.7 | 1127 | 25 |
| Rheumatic fever[d] | 116 | 5.2 | 89 | 3.9 | 205 | 4.5 |
| Salmonellosis | 467 | 21.1 | 487 | 21.2 | 954 | 21.2 |
| Shigellosis | 75 | 3.4 | 53 | 2.3 | 128 | 2.8 |
| Tuberculosis disease | 177 | 8.0 | 128 | 5.6 | 305 | 6.8 |
| Typhoid fever | 24 | 1.1 | 18 | 0.8 | 42 | 0.9 |
| VTEC/STEC infection | 80 | 3.6 | 107 | 4.7 | 187 | 4.1 |
| Yersiniosis | 342 | 15.5 | 340 | 14.8 | 682 | 15.1 |

[a] Total includes cases where sex was unknown.
[b] Cases of acute gastroenteritis from a common source or foodborne intoxication, eg, staphylococcal intoxication.
[c] Only acute cases of this disease are notifiable.
[d] Includes rheumatic fever initial attack and recurrent cases.
Note: For fewer than five cases notified, a rate is not calculated and the cell is blank.

## Notifiable disease cases and rates by age group, 2014

### Table 33. Number of cases and rate per 100,000 population of notifiable diseases by age group, 2014

| | <1 year | | 1–4 years | | 5–9 years | | 10–14 years | | 15–19 years | | 20–29 years | | 30–39 years | | 40–49 years | | 50–59 years | | 60–69 years | | 70+ years | | Total[a] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate |
| Campylobacteriosis | 139 | 236 | 655 | 262.1 | 315 | 102.8 | 239 | 80.8 | 358 | 114.2 | 1037 | 168.1 | 664 | 120.6 | 807 | 129.1 | 872 | 146.1 | 869 | 188.3 | 819 | 188.7 | 6776 | 150.3 |
| Cryptosporidiosis | 13 | 22.1 | 168 | 67.2 | 54 | 17.6 | 32 | 10.8 | 40 | 12.8 | 109 | 17.7 | 55 | 10.0 | 46 | 7.4 | 34 | 5.7 | 17 | 3.7 | 15 | 3.5 | 584 | 12.9 |
| Dengue fever | | | 1 | | 1 | | 5 | 1.7 | 6 | 1.9 | 30 | 4.9 | 37 | 6.7 | 28 | 4.5 | 40 | 6.7 | 29 | 6.3 | 2 | | 179 | 4.0 |
| Gastroenteritis[b] | 38 | 64.5 | 155 | 62.0 | 18 | 5.9 | 6 | 2.0 | 25 | 8.0 | 68 | 11.0 | 75 | 13.6 | 81 | 13.0 | 78 | 13.1 | 59 | 12.8 | 138 | 31.8 | 755 | 16.7 |
| Giardiasis | 22 | 37.4 | 352 | 140.8 | 141 | 46.0 | 43 | 14.5 | 33 | 10.5 | 163 | 26.4 | 368 | 66.8 | 241 | 38.6 | 147 | 24.6 | 162 | 35.1 | 36 | 8.3 | 1709 | 37.9 |
| Hepatitis A | 1 | | 4 | | 9 | 2.9 | 3 | | 7 | 2.2 | 16 | 2.6 | 10 | 1.8 | 7 | 1.1 | 7 | 1.2 | 5 | 1.1 | 5 | 1.2 | 74 | 1.6 |
| Hepatitis B[c] | 1 | | | | 1 | | | | 1 | | 8 | 1.3 | 4 | | 8 | 1.3 | 6 | 1.0 | 5 | 1.1 | 1 | | 35 | 0.8 |
| Hepatitis C[c] | | | | | | | | | 4 | | 9 | 1.5 | 9 | 1.6 | 4 | | 4 | | | | | | 30 | 0.7 |
| Invasive pneumococcal disease | 23 | 39.1 | 41 | 16.4 | 14 | 4.6 | 6 | 2.0 | 9 | 2.9 | 20 | 3.2 | 29 | 5.3 | 43 | 6.9 | 57 | 9.5 | 109 | 23.6 | 157 | 36.2 | 508 | 11.3 |
| Legionellosis | | | | | 1 | | 1 | | 1 | | 3 | | 3 | | 18 | 2.9 | 19 | 3.2 | 35 | 7.6 | 44 | 10.1 | 125 | 2.8 |
| Leptospirosis | | | | | | | 1 | | 1 | | 9 | 1.5 | 10 | 1.8 | 13 | 2.1 | 16 | 2.7 | 4 | | 2 | | 56 | 1.2 |
| Listeriosis | | | | | | | | | | | 1 | | 4 | | 1 | | 2 | | 7 | 1.5 | 10 | 2.3 | 25 | 0.6 |
| Malaria | | | | | 1 | | | | 4 | | 12 | 1.9 | 3 | | 2 | | 7 | 1.2 | 3 | | 1 | | 33 | 0.7 |
| Measles | 14 | 23.8 | 31 | 12.4 | 19 | 6.2 | 80 | 27.0 | 93 | 29.7 | 26 | 4.2 | 10 | 1.8 | 7 | 1.1 | | | | | | | 280 | 6.2 |
| Meningococcal disease | 6 | 10.2 | 15 | 6.0 | 1 | | | | 3 | | 4 | | 3 | | 3 | | 2 | | 5 | 1.1 | 4 | | 46 | 1.0 |
| Mumps | 1 | | 1 | | 6 | 2.0 | 2 | | 1 | | 2 | | 3 | | 1 | | 1 | | | | 1 | | 19 | 0.4 |
| Paratyphoid fever | | | | | | | 1 | | 3 | | 9 | 1.5 | 5 | 0.9 | 1 | | 1 | | | | 1 | | 21 | 0.5 |
| Pertussis | 89 | 151.1 | 131 | 52.4 | 76 | 24.8 | 58 | 19.6 | 43 | 13.7 | 116 | 18.8 | 133 | 24.2 | 169 | 27.0 | 127 | 21.3 | 108 | 23.4 | 77 | 17.7 | 1127 | 25 |
| Rheumatic fever[d] | | | 3 | | 46 | 15.0 | 77 | 26.0 | 33 | 10.5 | 39 | 6.3 | 6 | 1.1 | 1 | | | | | | | | 205 | 4.5 |
| Salmonellosis | 47 | 79.8 | 170 | 68.0 | 47 | 15.3 | 36 | 12.2 | 47 | 15.0 | 148 | 24.0 | 85 | 15.4 | 86 | 13.8 | 129 | 21.6 | 90 | 19.5 | 68 | 15.7 | 954 | 21.2 |
| Shigellosis | 2 | | 10 | 4.0 | 10 | 3.3 | 2 | | 5 | 1.6 | 21 | 3.4 | 19 | 3.5 | 21 | 3.4 | 19 | 3.2 | 13 | 2.8 | 6 | 1.4 | 128 | 2.8 |
| Tuberculosis disease | 1 | | 11 | 4.4 | 5 | 1.6 | 2 | | 13 | 4.1 | 73 | 11.8 | 62 | 11.3 | 40 | 6.4 | 32 | 5.4 | 30 | 6.5 | 36 | 8.3 | 305 | 6.8 |
| Typhoid fever | | | | | 4 | | 1 | | 7 | 2.2 | 14 | 2.3 | 8 | 1.5 | 3 | | 3 | | 2 | | | | 42 | 0.9 |
| VTEC/STEC infection | 11 | 18.7 | 72 | 28.8 | 17 | 5.5 | 6 | 2.0 | 10 | 3.2 | 17 | 2.8 | 11 | 2.0 | 11 | 1.8 | 10 | 1.7 | 13 | 2.8 | 9 | 2.1 | 187 | 4.1 |
| Yersiniosis | 28 | 47.5 | 104 | 41.6 | 26 | 8.5 | 28 | 9.5 | 26 | 8.3 | 117 | 19.0 | 88 | 16 | 82 | 13.1 | 73 | 12.2 | 63 | 13.7 | 47 | 10.8 | 682 | 15.1 |

[a] Total includes cases where age was unknown.
[b] Cases of acute gastroenteritis from a common source or foodborne intoxication, eg, staphylococcal intoxication.
[c] Only acute cases of this disease are notifiable.
[d] Includes rheumatic fever initial attack and recurrent cases.
Note: For fewer than five cases notified, a rate is not calculated and the cell is blank.

## Notifiable disease cases and rates by ethnic group, 2014

### Table 34. Number of cases and rate per 100,000 population of notifiable diseases by ethnic group, 2014

| Disease | Ethnic group | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Māori | | Pacific peoples | | Asian | | MELAA[a] | | European or Other | | Total[b] | |
| | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate | Cases | Rate |
| Campylobacteriosis | 506 | 75.2 | 139 | 50.1 | 313 | 61.3 | 43 | 86.4 | 5363 | 178.9 | 6776 | 150.3 |
| Cryptosporidiosis | 57 | 8.5 | 10 | 3.6 | 17 | 3.3 | 4 | | 472 | 15.7 | 584 | 12.9 |
| Dengue fever | 2 | | 29 | 10.5 | 39 | 7.6 | 3 | | 82 | 2.7 | 179 | 4.0 |
| Gastroenteritis[c] | 56 | 8.3 | 19 | 6.8 | 56 | 11.0 | 2 | | 541 | 18.9 | 755 | 16.7 |
| Giardiasis | 120 | 17.8 | 16 | 5.8 | 91 | 17.8 | 46 | 92.4 | 1301 | 43.4 | 1709 | 37.9 |
| Hepatitis A | 1 | | 27 | 9.7 | 20 | 3.9 | 2 | | 20 | 0.7 | 74 | 1.6 |
| Hepatitis B[d] | 3 | | 3 | | 7 | 1.4 | 1 | | 18 | 0.6 | 35 | 0.8 |
| Hepatitis C[d] | 6 | 0.9 | 2 | | | | 1 | | 20 | 0.7 | 30 | 0.7 |
| Invasive pneumococcal disease | 118 | 17.5 | 67 | 24.1 | 24 | 4.7 | 2 | | 270 | 9.0 | 508 | 11.3 |
| Legionellosis | 9 | 1.3 | 6 | 2.2 | 1 | | | | 108 | 3.6 | 125 | 2.8 |
| Leptospirosis | 12 | 1.8 | 2 | | 1 | | 1 | | 39 | 1.3 | 56 | 1.2 |
| Listeriosis | 2 | | 3 | | 5 | 1.0 | 1 | | 14 | 0.5 | 25 | 0.6 |
| Malaria | | | 1 | | 18 | 3.5 | 4 | | 9 | 0.3 | 33 | 0.7 |
| Measles | 108 | 16.0 | 19 | 6.8 | 28 | 5.5 | 4 | | 112 | 3.7 | 280 | 6.2 |
| Meningococcal disease | 16 | 2.4 | 4 | | | | | | 25 | 0.8 | 46 | 1.0 |
| Mumps | 3 | | 1 | | 4 | | 2 | | 8 | 0.3 | 19 | 0.4 |
| Paratyphoid fever | | | | | 9 | 1.8 | | | 12 | 0.4 | 21 | 0.5 |
| Pertussis | 164 | 24.4 | 77 | 27.7 | 35 | 6.8 | 7 | 14.1 | 780 | 26.0 | 1127 | 25.0 |
| Rheumatic fever[e] | 91 | 13.5 | 108 | 38.9 | | | | | 6 | 0.2 | 205 | 4.5 |
| Salmonellosis | 103 | 15.3 | 41 | 14.8 | 86 | 16.8 | 6 | 12.1 | 657 | 21.9 | 954 | 21.2 |
| Shigellosis | 4 | | 29 | 10.5 | 17 | 3.3 | 1 | | 67 | 2.2 | 128 | 2.8 |
| Tuberculosis disease | 39 | 5.8 | 49 | 17.7 | 179 | 35.0 | 13 | 26.1 | 20 | 0.7 | 305 | 6.8 |
| Typhoid fever | 1 | | 15 | 5.4 | 21 | 4.1 | 1 | | 3 | | 42 | 0.9 |
| VTEC/STEC infection | 20 | 3.0 | 1 | | 11 | 2.2 | 1 | | 148 | 4.9 | 187 | 4.1 |
| Yersiniosis | 52 | 7.7 | 31 | 11.2 | 128 | 25.1 | 8 | 16.1 | 440 | 14.7 | 682 | 15.1 |

[a] Middle Eastern/Latin American/African.
[b] Total includes cases where ethnicity was unknown.
[c] Cases of acute gastroenteritis from a common source or foodborne intoxication, eg, staphylococcal intoxication.
[d] Only acute cases of this disease are notifiable.
[e] Includes rheumatic fever initial attack and recurrent cases.

Note: Denominator data used to determine disease rates for ethnic groups is based on the proportion of people in each ethnic group from the estimated resident 2013 census population applied to the 2014 mid-year population estimates from Statistics New Zealand. Ethnicity is prioritised in the following order: Māori, Pacific peoples, Asian, MELAA and European or Other (including New Zealander) ethnic groups. For fewer than five cases notified, a rate is not calculated and the cell is blank.

## Notifiable disease cases by year and source, 1989–2014

### Table 35. Number of notifiable disease cases by year and source, 1989–2001[a]

| Disease | Source[b] | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AIDS | N | 59 | 73 | 78 | 50 | 70 | 44 | 49 | 76 | 43 | 29 | 33 | 26 | 26 |
| Campylobacteriosis | N | 4187 | 3850 | 4148 | 5144 | 8101 | 7714 | 7442 | 7635 | 8924 | 11572 | 8161 | 8418 | 10145 |
| Cholera | N | 0 | 5 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 1 | 1 | 0 | 3 |
| Creutzfeldt-Jakob disease | N | | | | | | | | 2 | 1 | 0 | 2 | 3 | 1 |
| Cryptosporidiosis | N | | | | | | | | 119 | 357 | 866 | 977 | 775 | 1208 |
| Dengue fever | N | 3 | 2 | 3 | 1 | 1 | 0 | 6 | 23 | 14 | 26 | 9 | 7 | 93 |
| Gastroenteritis[c] | N | | | | | | | | 555 | 316 | 493 | 608 | 730 | 942 |
| Giardiasis | N | | | | | | | | 1235 | 2127 | 2183 | 1793 | 1688 | 1604 |
| *Haemophilus influenzae* type b | N | | | | | | | | 26 | 9 | 11 | 10 | 13 | 11 |
| | L | 121 | 143 | 148 | 166 | 118 | 75 | 14 | 24 | 8 | 10 | 9 | 10 | 8 |
| Hepatitis A | N | 134 | 150 | 224 | 288 | 257 | 179 | 338 | 311 | 347 | 145 | 119 | 107 | 61 |
| Hepatitis B[d] | N | 309 | 242 | 227 | 221 | 145 | 133 | 125 | 104 | 138 | 88 | 94 | 79 | 56 |
| Hepatitis C[d] | N | 13 | 11 | 25 | 89 | 91 | 79 | 88 | 59 | 92 | 102 | 96 | 80 | 58 |
| Hydatid disease | N | 0 | 4 | 0 | 4 | 4 | 1 | 5 | 3 | 2 | 2 | 8 | 3 | 7 |
| Legionellosis | N | 17 | 20 | 14 | 11 | 24 | 66 | 33 | 36 | 63 | 43 | 51 | 61 | 46 |
| | L | | 21 | 42 | 60 | 76 | 121 | 76 | 60 | 109 | 107 | 65 | 56 | 56 |
| Leprosy | N | 4 | 1 | 4 | 5 | 3 | 1 | 1 | 10 | 3 | 3 | 10 | 4 | 3 |
| Leptospirosis | N | 90 | 117 | 106 | 70 | 116 | 70 | 65 | 56 | 52 | 75 | 59 | 98 | 99 |
| | L | 182 | 229 | 176 | 218 | 234 | 168 | 183 | 140 | 84 | 117 | 76 | 114 | 113 |
| Listeriosis | N | 10 | 16 | 26 | 16 | 11 | 8 | 13 | 10 | 35 | 17 | 19 | 22 | 18 |
| Malaria | N | 27 | 32 | 39 | 29 | 58 | 34 | 41 | 107 | 65 | 73 | 46 | 111 | 54 |
| Measles | N | | | | | | | | 68 | 1984 | 164 | 107 | 64 | 82 |
| Meningococcal disease | N | 49 | 53 | 71 | 153 | 202 | 208 | 394 | 473 | 609 | 439 | 507 | 477 | 648 |
| Mumps | N | | | | | | | | 76 | 90 | 85 | 56 | 50 | 56 |
| Paratyphoid fever | N | 0 | 1 | 1 | 2 | 10 | 7 | 24 | 20 | 25 | 18 | 17 | 24 | 32 |
| Pertussis | N | | | | | | | | 1022 | 284 | 153 | 1046 | 4140 | 1334 |
| Rheumatic fever - initial attack | N | 148 | 90 | 97 | 70 | 81 | 98 | 88 | 110 | 93 | 66 | 97 | 108 | 114 |
| Rubella | N | | | | | | | | 306 | 80 | 53 | 35 | 26 | 30 |
| Salmonellosis | N | 1860 | 1619 | 1244 | 1239 | 1340 | 1522 | 1334 | 1141 | 1177 | 2069 | 2077 | 1795 | 2417 |
| Shigellosis | N | 137 | 197 | 152 | 124 | 128 | 185 | 191 | 167 | 117 | 122 | 147 | 115 | 157 |
| Tetanus | N | 0 | 0 | 0 | 8 | 2 | 2 | 2 | 3 | 0 | 2 | 6 | 1 | 4 |
| Tuberculosis disease | N | 303 | 348 | 335 | 327 | 323 | 352 | 391 | 352 | 323 | 365 | 446 | 354 | 369 |
| Typhoid fever | N | 17 | 7 | 9 | 11 | 14 | 24 | 21 | 15 | 16 | 31 | 10 | 21 | 27 |
| VTEC/STEC infection | N | | | | | 3 | 3 | 6 | 7 | 13 | 48 | 64 | 67 | 76 |
| Yersiniosis | N | | | | | | | | 330 | 488 | 546 | 503 | 396 | 429 |

[a] Table is continued on the following page.
[b] Source: notification (N), laboratory (L), sentinel isolates (S).
[c] Cases of acute gastroenteritis from a common source or foodborne intoxication, eg, staphylococcal intoxication.
[d] Only acute cases of this disease are notifiable.

## Notifiable disease cases by year and source, 1989–2014

### Table 35. Number of notifiable disease cases by year and source, 2002–2014 [a] (continued)

| Disease | Source[b] | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AIDS | N | 17 | 33 | 38 | 49 | 29 | 31 | 48 | 28 | 39 | 24 | 20 | 25 | 19 |
| Campylobacteriosis | N | 12493 | 14788 | 12215 | 13836 | 15873 | 12778 | 6694 | 7177 | 7346 | 6686 | 7016 | 6837 | 6776 |
| Cholera | N | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| Creutzfeldt-Jakob disease | N | 3 | 6 | 8 | 3 | 5 | 8 | 5 | 8 | 5 | 4 | 9 | 6 | 6 |
| Cryptosporidiosis | N | 975 | 817 | 611 | 888 | 737 | 924 | 764 | 854 | 954 | 610 | 877 | 1348 | 584 |
| Dengue fever | N | 70 | 55 | 8 | 11 | 19 | 114 | 113 | 139 | 50 | 42 | 76 | 106 | 179 |
| Gastroenteritis [c] | N | 1088 | 1030 | 1363 | 560 | 938 | 625 | 687 | 713 | 502 | 570 | 765 | 559 | 774 |
| Giardiasis | N | 1547 | 1570 | 1514 | 1231 | 1214 | 1402 | 1660 | 1639 | 1985 | 1934 | 1714 | 1729 | 1709 |
| *Haemophilus influenzae* type b | N | 3 | 12 | 4 | 7 | 9 | 15 | 9 | 10 | 8 | 8 | 4 | 2 | 5 |
| | L | 3 | 9 | 3 | 6 | 8 | 13 | 4 | 8 | 8 | 8 | 4 | 2 | 2 |
| Hepatitis A | N | 106 | 70 | 49 | 51 | 123 | 42 | 89 | 44 | 46 | 26 | 82 | 91 | 74 |
| Hepatitis B [d] | N | 67 | 61 | 38 | 59 | 61 | 72 | 37 | 55 | 51 | 51 | 39 | 28 | 35 |
| Hepatitis C [d] | N | 53 | 40 | 24 | 29 | 35 | 30 | 22 | 32 | 16 | 26 | 31 | 36 | 30 |
| Hydatid disease | N | 2 | 0 | 1 | 2 | 0 | 6 | 7 | 2 | 4 | 6 | 1 | 7 | 4 |
| Legionellosis | N | 49 | 77 | 62 | 85 | 52 | 64 | 73 | 74 | 173 | 158 | 150 | 151 | 125 |
| | L | 53 | 82 | 75 | 83 | 54 | 72 | 74 | 77 | 178 | 160 | 152 | 150 | 135 |
| Leprosy | N | 4 | 4 | 3 | 2 | 4 | 8 | 5 | 3 | 3 | 1 | 2 | 7 | 4 |
| Leptospirosis | N | 140 | 113 | 102 | 85 | 87 | 66 | 118 | 69 | 81 | 68 | 108 | 60 | 56 |
| | L | 181 | 149 | 113 | 109 | 66 | 40 | 73 | 49 | 58 | 45 | 78 | 46 | 40 |
| Listeriosis | N | 19 | 24 | 26 | 20 | 19 | 26 | 27 | 28 | 23 | 26 | 25 | 19 | 25 |
| Malaria | N | 61 | 46 | 33 | 32 | 30 | 25 | 40 | 50 | 44 | 52 | 38 | 47 | 33 |
| Measles | N | 21 | 66 | 32 | 18 | 18 | 24 | 12 | 248 | 48 | 596 | 68 | 8 | 280 |
| Meningococcal disease | N | 555 | 542 | 343 | 226 | 160 | 104 | 122 | 132 | 97 | 119 | 85 | 68 | 46 |
| Mumps | N | 64 | 56 | 45 | 61 | 47 | 73 | 76 | 63 | 41 | 51 | 26 | 23 | 19 |
| Paratyphoid fever | N | 16 | 18 | 28 | 25 | 23 | 23 | 25 | 25 | 19 | 13 | 22 | 25 | 21 |
| Pertussis | N | 1068 | 585 | 3485 | 2719 | 1120 | 332 | 417 | 1398 | 872 | 1996 | 5897 | 3540 | 1127 |
| Rheumatic fever - initial attack | N | 87 | 148 | 75 | 76 | 105 | 134 | 140 | 126 | 153 | 154 | 164 | 192 | 185 |
| Rubella | N | 33 | 26 | 23 | 13 | 7 | 10 | 9 | 4 | 4 | 22 | 4 | 1 | 4 |
| Salmonellosis | N | 1880 | 1401 | 1081 | 1382 | 1335 | 1275 | 1339 | 1128 | 1146 | 1055 | 1081 | 1143 | 954 |
| Shigellosis | N | 112 | 87 | 140 | 183 | 102 | 129 | 113 | 119 | 104 | 101 | 132 | 137 | 128 |
| Tetanus | N | 1 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 7 | 0 | 2 | 1 | 0 |
| Tuberculosis disease | N | 380 | 422 | 373 | 330 | 350 | 283 | 293 | 298 | 304 | 306 | 293 | 275 | 305 |
| Typhoid fever | N | 23 | 20 | 31 | 30 | 42 | 48 | 29 | 34 | 31 | 45 | 44 | 50 | 42 |
| VTEC/STEC infection | N | 73 | 104 | 89 | 92 | 87 | 100 | 124 | 143 | 138 | 153 | 147 | 205 | 187 |
| Yersiniosis | N | 472 | 436 | 407 | 383 | 453 | 502 | 508 | 430 | 406 | 513 | 514 | 484 | 682 |

[a] Table is continued from the previous page.
[b] Source: notification (N), laboratory isolate received at ESR (L), sentinel isolates (S).
[c] Cases of acute gastroenteritis from a common source or foodborne intoxication, eg, staphylococcal intoxication.
[d] Only acute cases of this disease are notifiable.

## Selected *Salmonella* serotypes and phage types, 2010–2014 (Enteric Reference Laboratory, ESR)

### Table 36. Number of laboratory-reported cases of salmonellosis for selected *Salmonella* serotypes and phage types, 2010–2014

| Serotype[a] | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|
| **S. Typhimurium** | **594** | **495** | **459** | **481** | **392** |
| 1 | 36 | 54 | 35 | 30 | 22 |
| 12a | 35 | 28 | 26 | 15 | 20 |
| 56 variant[b] | 85 | 73 | 73 | 122 | 72 |
| 101 | 70 | 50 | 26 | 26 | 41 |
| 135 | 48 | 46 | 44 | 48 | 35 |
| 156 | 35 | 29 | 21 | 17 | 9 |
| 160 | 107 | 66 | 58 | 69 | 27 |
| Other phage types or unidentified | 178 | 149 | 176 | 154 | 166 |
| **S. Enteritidis** | **113** | **134** | **125** | **137** | **116** |
| 1b | 5 | 8 | 9 | 14 | 5 |
| 11[c] | 49 | 58 | 52 | 27 | 39 |
| Other phage types or unidentified | 59 | 68 | 64 | 96 | 72 |
| **Other serotypes** | **437** | **410** | **460** | **523** | **450** |
| *S.* Agona | 12 | 20 | 11 | 11 | 15 |
| *S.* Brandenburg | 47 | 34 | 34 | 52 | 35 |
| *S.* Infantis | 54 | 65 | 52 | 70 | 56 |
| *S.* Mississippi | 9 | 13 | 12 | 20 | 21 |
| *S.* Montevideo | 13 | 1 | 26 | 11 | 7 |
| *S.* Saintpaul | 34 | 31 | 27 | 43 | 26 |
| *S.* Stanley | 28 | 28 | 22 | 31 | 34 |
| *S.* Virchow | 16 | 18 | 17 | 15 | 5 |
| *S.* Weltevreden | 23 | 16 | 24 | 28 | 31 |
| *S. enterica* (I) ser. 4,[5],12 : i : - | 21 | 21 | 38 | 27 | 27 |
| Other serotypes or unidentified | 180 | 164 | 197 | 215 | 193 |
| **Total** | **1144** | **1039** | **1044** | **1141** | **958** |

[a] Excludes *S.* Paratyphi and *S.* Typhi.

[b] Before 2013, *S.* Typhimurium phage type 56 variant was known as *S.* Typhimurium RDNC-May 06.

[c] Before 2012, *S.* Enteritidis phage type 11 was known as a 9a. Further typing was performed on isolates previously confirmed as *S.* Enteritidis phage type 9a. However, typing results revealed that some isolates previously reported as *S.* Enteritidis phage type 9a were phage type 11.

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# REFERENCES

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# ACRONYMS AND ABBREVIATIONS

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# ACRONYMS AND ABBREVIATIONS

| Acronym/Abbreviation | Description |
|---|---|
| AEG | AIDS Epidemiology Group |
| AFP | Acute flaccid paralysis |
| AIDS | Acquired immunodeficiency syndrome |
| BCG | Bacillus Calmette-Guérin |
| CJD | Creutzfeldt-Jakob disease |
| CRS | Congenital rubella syndrome |
| DHB | District Health Board |
| DTaP-IPV-HepB/Hib | Diphtheria, tetanus, acellular pertussis, inactivated polio, hepatitis B and *Haemophilus influenzae* vaccine |
| ESR | Institute of Environmental Science and Research Limited |
| Hib | *Haemophilus influenzae* serotype b |
| HIV | Human immunodeficiency virus |
| HPAI | Highly pathogenic avian influenza |
| HUS | Haemolytic uraemic syndrome |
| ICD | International Classification of Diseases |
| IPD | Invasive pneumococcal disease |
| IPV | Inactivated polio vaccine |
| MAT | Microscopic agglutination titre |
| MELAA | Middle Eastern/Latin American/African |
| MeNZB™ | Meningococcal B outer membrane vesicle vaccine |
| MERS | Middle East respiratory syndrome |
| MMR | Measles, mumps and rubella |
| NAT | Nucleic acid testing |
| NCCEP | National Certification Committee for the Eradication of Polio |
| nfd | Not further defined |
| NHI | National Health Index |
| NMDS | National Minimum Dataset |
| NOS | Not otherwise specified |
| OPV | oral polio vaccine |
| NZPSU | New Zealand Paediatric Surveillance Unit |
| PCR | Polymerase chain reaction |
| PCV7 | 7-valent pneumococcal conjugate vaccine |
| PCV10 | 10-valent pneumococcal conjugate vaccine |
| PCV13 | 13-valent pneumococcal conjugate vaccine |
| PHU | Public health unit |
| RDNC | Reacts but does not conform to a known phage type pattern |
| sg | Serogroup |
| STEC | Shiga toxin-producing *Escherichia coli* |
| Tdap | Tetanus, diphtheria and acellular pertussis vaccine |
| VTEC | Verotoxin-producing *Escherichia coli* |
| WHO | World Health Organization |

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