ANNUAL SURVEILLANCE SUMMARY

2001

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by

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DISCLAIMER

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EXECUTIVE SUMMARY

This report aims to provide a concise review of the descriptive epidemiology of the main infectious diseases under public health surveillance in New Zealand, as well as lead absorption, which is also monitored using the notifiable disease surveillance system. The focus is on events and trends that emerged in 2001. Key features were:

- *Meningococcal disease*: The meningococcal epidemic, which began in mid-1991, reached a new peak in 2001. A total of 650 cases was reported (with 26 deaths), giving a rate of 17.4 per 100 000 population. As previous years, rates were highest among the under 5 age group, and among Maori and Pacific people. The case fatality rate for 2001 was 4.0%, a similar rate to recent years. The case fatality rate for cases seen by a doctor prior to hospitalisation and given antibiotics was 2.2% compared to 7.5% for cases not seen by a doctor and not given antibiotics. Serogroup B disease continued to predominate during 2001 although an increase in serogroup C disease to 9.4% of the cases proportionately lowered serogroup B involvement to 88.4%. Meningococci with the PorA subtype P1.7b, 4 continued to cause most disease (80.5% of cases where the PorA subtype could be determined). This PorA subtype is the target antigen in the vaccine that will be used in trials in New Zealand aimed at limiting the epidemic.

- *Tuberculosis:* The number of cases of tuberculosis increased in 2001 by 28 cases over 2000 reaching a total of 381 cases. This trend follows that of the last 13 years since the low of 295 cases in 1988. Cases arise from both local transmission (31.3%) and imported disease (68.7%).

- *Acute Rheumatic Fever (ARF):* The incidence of ARF remains high at 111 new cases in 2001. The rate of 3.1 per 100 000 is very high for a developed country and is failing to decline. Most cases are in Maori and Pacific people aged between 5 to 15 years. These individuals are at risk of developing chronic rheumatic heart disease. The number of recurrences of ARF has decreased from 12 in 2000 to three in 2001.

- *Pertussis:* The pertussis epidemic that began in June 1999 became a national epidemic persisting through into 2001. During 2001 it resulted in 1335 notified cases and 92 hospitalisations. This rate of 35.7 per 100 000 was a significant (Chi-square, $p<0.001$) decline from the 2000 rate of 114.5 per 100 000. In New Zealand pertussis epidemics tend to occur every four to five years as the number of susceptibles in the population increase as a result of incomplete vaccination and waning vaccine immunity. Control of this disease depends on increasing vaccine coverage rates.

- *Other vaccine preventable diseases:* Measles, mumps, and rubella incidence remained low in 2001. Based on a five to six year inter-epidemic period, the next measles epidemic may be expected to occur in 2002. *Haemophilus influenzae* type b (Hib) disease continues to decline following addition of Hib vaccine to the immunisation schedule in 1994. Hepatitis B incidence also continued its gradual decline following introduction of universal childhood vaccination in the 1980's.

- *Influenza:* During the 2001 winter season, the incidence of influenza-like illness was higher than in 2000, but lower than in 1999. In 2001, the national average weekly consultation rate was 62.8 per 100 000 patient population, compared with 32.5 in 2000. Influenza A (H1N1) was the predominant strain in June and July whereas in August and September, influenza B was the predominant one. Influenza A (H3N2) remained at a low level throughout the winter season.

- *Enteric diseases:* Enteric diseases notifications increased in 2001 to 17118, compared with 14160 in 2000, comprising 82% of all notifications (c.f. 69% in 2000). Campylobacteriosis remains the most frequently notified disease. New Zealand's rate 271.5 (per 100 000 population) is far higher than other developed countries. Salmonellosis notifications in 2001 were the highest ever recorded, the dominant serotypes being *Salmonella* Typhimurium phage type 160 and *S.* Typhimurium phage type 135.
  VTEC/STEC notifications in 2001 were the highest on record, a matter for concern given the severe spectrum of illness associated with VTEC/STEC infection and its potential to cause large outbreaks.
  Cryptosporidiosis and Shigellosis increased significantly (Chi-square, $p<0.001$ and $p<0.5$ respectively) in 2001 with the number of cases of Cryptosporidiosis the highest yearly total ever recorded. Hepatitis A decreased significantly (Chi-square, $p<0.001$) in 2001 with the yearly total being the lowest number on record. Giardiasis showed a slight decrease in rate in 2001 and the rate of Yersiniosis was fairly stable.
- *Zoonoses*: Leptospirosis remains New Zealand's most important zoonotic disease. The incidence in 2001 was slightly higher than in 2000. Most cases (88.4%) occurred in occupational groups having contact with farm animals or rodents (farmers, farm workers, meat workers, and forestry workers).
- *Vector borne diseases:* The incidence of imported dengue fever rose sharply in 2001 with 93 notified cases. This is the highest yearly total on record with the majority of the cases reporting travel to Samoa. Notified cases of malaria dropped to 54 cases in 2001. Three cases of Ross River Infection were notified. The continuing arrival of infected and viraemic people raises the possibility that these arboviral diseases could become established here.
- *Rickettsial Disease*: The presence of rickettsial disease in New Zealand was not confirmed until 2000, when testing of a DNA fragment from white cells collected from an Auckland case was found to have 100% homology with *R typhi*. While only demonstrated with certainty in the Auckland region, it is likely that *R typhi*, the causative agent for murine typhus, is also present in other regions of New Zealand. Rickettsial DNA from a rat trapped on the property of one of the cases suggests that rats may be the reservoir and rat fleas the vector for *R typhi*. Prevention of murine typhus is directed mainly at control of potential flea hosts, such as rats.
- *Diseases from contaminated environments: There* were 46 cases of legionellosis notified in 2001, of note is the increasing proportion of cases caused by *Legionella longbeachae* (55.4%).
- *Travel-associated disease*: Overseas travel was a major risk factor (greater than 44.4% of cases had this as a recorded risk factor) for hepatitis A, paratyphoid, shigellosis and typhoid.
- *HIV /AIDS:* In 2001, 26 cases of AIDS were notified to the AIDS Epidemiology Group (similar to 2000). There were 95 new cases of HIV infection notified, a slight increase on the 88 cases in 2000. The predominant risk behaviour category for AIDS remains homosexual contact, thought this is relatively less important for new cases of HIV infection. In 2001, heterosexual contact was responsible for an increasing proportion of new AIDS notifications (54%) and new HIV infections (44%). Most (64%) of these new HIV infections have occurred overseas.

- *Sexually transmitted infections:* In 2001, the 32 sexual health clinics reported 8785 STI cases. Genital warts was the most commonly diagnosed STI (4.3%), followed by chlamydia (4.2%), NSU in males (1.4%), genital herpes (0.9%), gonorrhoea (0.7%) and syphilis (0.03%). The incidence of the bacterial STIs, chlamydia, and gonorrhoea continued to increase. Sexual health clinics reported 3238 cases of chlamydia in 2001, a 13% increase from 2000, and 533 cases of gonorrhoea, an 8% increase from 2000.
- *Blood borne and tissue-borne infections:* There were 60 cases of Hepatitis C notified in 2001 (c.f. 80 in 2000). The principal risk factor was a history of injecting drug use, reported by 66.7%. The data greatly underestimate the true incidence of HCV infection, as most new infections are asymptomatic. One case of Creutzfeldt-Jakob disease (CJD) was notified in 2001. The case did not have any features suggestive of new variant CJD.
- *Lead absorption:* The number of notifications of lead absorption increased slightly in 2001 compared with 2000. Most (93.1%) were in adults aged 15 years or older. Lead absorption became notifiable at the new level of 15µg/dl in 1996, and since then notifications have increased each year except in 2000. The majority of this increase has occurred in adults and has been due to occupation or hobby related exposure to lead.
- *Outbreaks:* There were 389 reported outbreaks in 2001, involving 2323 cases. This exceeds the number of outbreaks and cases for 2000 (289 outbreaks, 2296 cases). A total of 78 cases were hospitalised, and 2 deaths were recorded (meningococcal disease) for 2001. Enteric pathogens were identified or suspected in 369 (94.9%) of the 2001 outbreaks. The most commonly implicated pathogen or toxin was Campylobacter (56 outbreaks, 14.4%) followed by Norwalk-like virus (NLV) (45 outbreaks, 11.6%) and Salmonella (37, 9.5%).
- *Fatalities:* A total of 47 deaths from notifiable diseases were notified in 2001, in comparison to 64 deaths in 2000. The diseases accounting for the highest number of deaths in 2001 were meningococcal disease (26 deaths), followed by AIDS (9), legionellosis, listeriosis, salmonellosis, and tuberculosis (2 each).
- *Hospitalisations:* Hospitalisation status was recorded for 14 640 cases or 70.0% of the 20 913 cases notified during 2001. Of these, 13.9% (2030/14640) were hospitalised. This represents a slight increase on the 2000 hospitalisation rate of 12.6% (1977 of the 15 721 cases). As in 2000, the diseases accounting for the highest number of hospitalisations were meningococcal disease (614 hospitalisations), campylobacteriosis (393), salmonellosis (279), tuberculosis (213), and pertussis (92).
- *Ethnic disparities:* Diseases that showed markedly higher rates among Maori compared with Europeans were *haemophilus influenzae type b,* hepatitis A, hepatitis B, meningococcal disease, mumps, rheumatic fever, and tuberculosis. Diseases that showed markedly higher rates among Pacific people compared with Europeans were dengue fever, hepatitis A, hepatitis B, listeriosis, meningococcal disease, mumps, rheumatic fever, shigellosis, and tuberculosis. Diseases that showed markedly higher rates among Europeans compared with Maori and/or Pacific people were campylobacteriosis, cryptosporidiosis, gastroenteritis , giardiasis, lead absorption, legionellosis, measles, pertussis, salmonellosis, and VTEC/STEC infection. Diseases that showed markedly higher rates among people of ‘Other’ ethnicity compared with European, Maori and/or Pacific people were AIDS, malaria, paratyphoid, tuberculosis, typhoid, and yersiniosis.

- *Age distribution*: The diseases most common among young children were the enteric diseases, vaccine-preventable diseases, and meningococcal disease, while rheumatic fever was most common among young adults. Hepatitis B and C, leptospirosis and STIs were most common among adults, while legionellosis and listeriosis were most common among older adults and the elderly. The age-related distribution of these diseases was similar to the pattern seen in 2000.

Introduction

The aim of this report is to produce a summary of the distribution of communicable diseases of public health importance in New Zealand. Surveillance data for lead absorption are also reported. While the majority of these diseases are currently notifiable under the Health Act 1956 or the Tuberculosis Act 1948, the scope also includes some diseases that are under surveillance through other systems.

This report focuses on the distribution of these diseases in 2001 and longer-term incidence. It aims to disseminate these surveillance data to those who need this information to support prevention and control measures.

Purposes of surveillance

Surveillance is the ongoing systematic collection, analysis and interpretation of health data essential to the planning, implementation and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know. The final link in the surveillance chain is the application of these data to prevention and control.[1]

The main reasons for disease surveillance are as follows:[2]

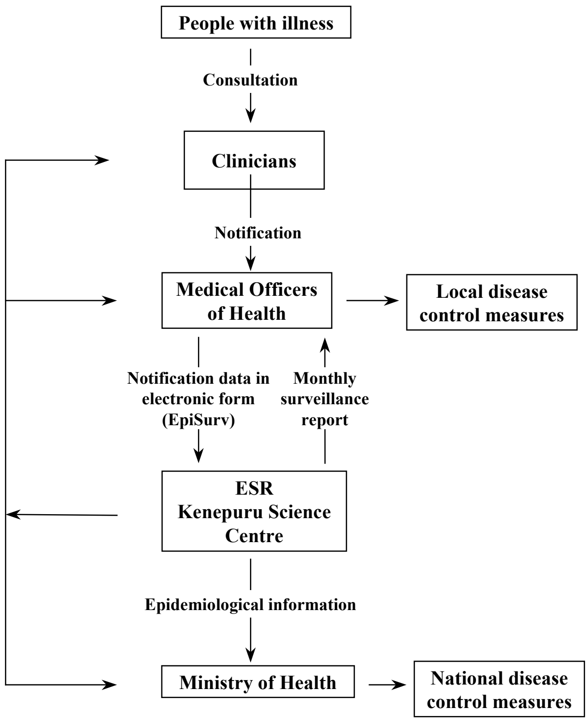
- to identify cases of disease that require immediate public health control measures
- to monitor disease incidence and distribution, and alert health workers to changes of disease activity in their area
- to identify outbreaks and support their effective management
- to assess disease impact and help set priorities for prevention and control activities
- to identify risk factors for diseases 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 occurrence
- to fulfil statutory and international reporting requirements.

Methods

Surveillance systems: The key sources of data that have been used in compiling this report are as follows:

- **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. These notifications provide the basis for surveillance and hence control of these diseases in New Zealand. Notification data are recorded on a computerised database (EpiSurv) installed in each of 20 public health services (PHS). Each week, these data are sent to the Institute of Environmental Science and Research (ESR) Ltd where they are collated and analysed on behalf of the Ministry of Health. The data collected on each disease depends on the disease in question but usually includes demographic, outcome, basis of diagnosis, risk factor and some management information. Some of the diseases included only became notifiable with the revised schedule of notifiable diseases which came into effect on 1 June 1996, e.g. measles, yersiniosis.

The communicable disease surveillance system –major components and information flow



- **Clinical laboratory-based surveillance (CLBS)**
  CLBS is the collection of laboratory data for public health purposes. Several of the communicable diseases diagnosed by clinical laboratories are either not covered adequately or not covered at all by the notifiable disease surveillance systems.[3] Also, CLBS sometimes takes place to enhance surveillance data gathered by other methods. Examples of organisms covered by CLBS are antimicrobial resistant organisms[4], legionellae, leptospira, meningococci, respiratory syncytial virus (RSV), salmonellae, and streptococci.

- **Surveillance of HIV & AIDS in New Zealand**
  Since 1989, the AIDS Epidemiology Group in Dunedin has been contracted to collect information about people diagnosed with AIDS through a compulsory notification system to the Medical Officers of Health. Detailed information has also been collected about people infected with HIV since 1996 through a laboratory-based surveillance system involving the two laboratories that perform confirmatory HIV antibody testing using the Western blot method (Kenepuru Science Centre, Institute of Environmental Science and Research and the Virus Laboratory, Auckland Hospital).[5] For each confirmed diagnosis, either the laboratory or the AIDS Epidemiology Group send a letter to the doctor who requested the test seeking information on the likely mode of infection and other demographic data. Coding ensures that the identity of the patient is known only to the reporting doctor, but is sufficiently specific to allow detection of duplicate reports.

- **Sexually Transmitted Infection (STI) sentinel surveillance system.**
  Except for AIDS, all STIs are not notifiable in New Zealand. Surveillance is primarily based on reporting by sexual health clinics (currently 32 in New Zealand).[6] ESR took over the national operation of the STI sentinel surveillance system in 1995. Sexual health clinics report basic demographic data on cases of chlamydia, gonorrhoea, genital herpes, genital warts, syphilis, and non-specific urethritis (NSU) in males. Each month, sexual health clinics send their data to ESR for collation and analysis. However, as sexual health clinics see a changing and self-selected subset of the population with STIs, their data may not necessarily be representative of the general population and cannot be used to calculate population rates. STI surveillance has progressively been expanded since 1998 to include data from family planning clinics, student and youth health services, and laboratories. Laboratory-based surveillance for chlamydia and gonorrhoea is now operating in the Waikato-Bay of Plenty area, and Auckland.[7] The data presented in this report is based on data from sexual health clinics, family planning clinics, student and youth health clinics and laboratories.

- **Influenza sentinel surveillance system**
  A sentinel surveillance system has been developed which gathers data on the incidence and distribution of influenza.[8] National influenza surveillance is undertaken from May to September each year. This surveillance is based on a network of general practices recruited from all health districts in New Zealand. About 80 practices participate. The number chosen is proportional to the size of the population in each health district covered by the PHS. General practitioners are asked to record the number of consultations for influenza-like illness (defined by a standardised case definition) each week and the age group of each of these suspected cases. Each practice is also requested to collect swabs from up to three patients per week. The swabs are sent to regional virus laboratories for viral isolation and strain identification.[8]

New Zealand Paediatric Surveillance Unit (NZPSU)

NZPSU was established in late 1997 to provide active surveillance of acute flaccid paralysis (AFP) in order to fulfil World Health Organisation requirements for certification of polio eradication.[9] In January 1998, the conditions under surveillance were expanded to include haemolytic uraemic syndrome (HUS), congenital rubella syndrome (CRS), perinatal exposure to HIV, vitamin K deficiency, bleeding, and neonatal herpes simplex infection. Every month, participating paediatricians and other specialists in paediatric practice send a reply-paid card to the NZPSU on which they indicate whether in the previous month they have seen any cases of the conditions under surveillance. These data are then collated and analysed by the NZPSU.[9] Information from the NZPSU is used in this report to enhance notification data on VTEC/STEC infection (HUS data) and rubella (CRS data).

- **Outbreak surveillance**
  ESR introduced an outbreak surveillance system in July 1996 and has been improving this system in a series of planned steps since then.[10] The surveillance system has operated electronically since mid 1997 as an additional module of EpiSurv. In mid 2000, EpiSurv and ESR laboratory reported outbreaks were matched for the first time. Unlike the other surveillance systems described above, this system collects data on disease outbreaks, rather than individual cases.

Calculation of rates: Rates were calculated using population data from the 2001 Census.

For calculating rates of disease among returning travellers, data on New Zealand residents travelling overseas for less than 12 months in 2001 were used for the denominator. These data were based on the country recorded by travellers as the final destination on their departure cards (provided by Statistics New Zealand). Data is reported by the following regions:

Australia (includes External Territories)
Oceania and Antarctica (excluding Australia)
North West Europe
Southern and Eastern Europe
North Africa and the Middle East
South East Asia
North East Asia
Southern and Central Asia
Northern America
Southern and Central America
Sub-Saharan Africa

These regions are based on the major groups from the New Zealand Standard Classification of Countries 1999 (NZSCC99)

Countries visited by travellers en route to or from the final destination are not included on the departure card. Therefore, the number of travellers to any one country may be an underestimate of the true number of visits and rates of disease in travellers must be interpreted with caution.

Data used in this report: Notification data contained in this report are based on information recorded on EpiSurv as at 19th March 2002. Any changes made to EpiSurv data by PHS staff after this date will not be reflected in this report. Consequently, future analyses of these data may produce revised results for total incidence and specific analyses. With the exception of meningococcal disease which is reported according to the earliest date for the case (i.e. onset or hospitalisation date, if available, rather than date of notification), disease numbers are reported according to date of notification.

Statistical tests:
The tests used to determine statistical significance were chi-square or Fisher's exact test where relevant. P-values less than or equal to 0.05 are considered to be significant at the 95% level of confidence.

National surveillance data and trends

National surveillance data – 2000-2001 (for selected diseases included in annual report)

Disease[1,2]	2001		2000	
	Total cases	Rate	Total cases	Rate
AIDS	26	0.7	27	0.7
Campylobacteriosis	10148	271.5	8421	225.3
Cholera	3	0.1	0	0.0
Creutzfeldt-Jakob disease	1	0.0	3	0.1
Cryptosporidiosis	1207	32.3	775	20.7
Dengue fever	93	2.5	7	0.2
Gastroenteritis[3]	938	25.1	726	19.4
Giardiasis	1603	42.9	1686	45.1
H. influenzae type b disease	14	0.4	13	0.3
Hepatitis A	61	1.6	107	2.9
Hepatitis B	57	1.5	79	2.1
Hepatitis C	60	1.6	80	2.1
Hydatid disease	7	0.2	3	0.1
Influenza	313	8.4	73	2.0
Lead absorption	130	3.5	124	3.3
Legionellosis	46	1.2	61	1.6
Leprosy	2	0.1	5	0.1
Leptospirosis	105	2.8	98	2.6
Listeriosis	18	0.5	22	0.6
Malaria	54	1.4	111	3.0
Measles	83	2.2	64	1.7
Meningococcal disease	650	17.4	480	13.3
Mumps	56	1.5	50	1.3
Paratyphoid	33	0.9	24	0.6
Pertussis	1335	35.7	4140	110.8
Rheumatic fever	111	3.0	136	3.6
Rubella	30	0.8	26	0.7
Salmonellosis	2417	64.7	1796	48.1
Shigellosis	157	4.2	115	3.1
Tetanus	4	0.1	1	0.0
Tuberculosis	381	10.2	354	9.5
Typhoid	26	0.7	21	0.6
VTEC / STEC infection	76	2.0	67	1.8
Yersiniosis	429	11.5	396	10.6

Notes: [1] No cases of the following notifiable diseases were reported in 2001: anthrax, botulism, brucellosis, cysticercosis, diphtheria, poliomyelitis, primary amoebic meningoencephalitis, plague, rabies, viral haemorrhagic fever, or yellow fever

[2] In addition to those listed in the table above, one case of arsenic poisoning, three cases of chemical poisoning five cases of rickettsial disease, three cases of Ross River virus infection, two cases of trichinosis and two cases of toxic shellfish poisoning were reported

[3] Cases of gastroenteritis from a common source or foodborne intoxication eg, staphlyococcal intoxication

Arsenic poisoning

One confirmed case of arsenic poisoning was notified in 2001. The case was a 39 year old female from Canterbury Health District, who had elevated urinary arsenic (2.8 umol/L in March 2001) and blood mercury (31 nmol/L in June 2000 and 20 nmol/L in August 2000). This amount of arsenic in the urine is about 14-fold above a 'normal' background level. However, as the urinary arsenic level had decreased to 0.2 umol/L (essentially background) by May 2001, the investigation was not continued. The case was not occupationally exposed to arsenic, nor was any source identified.

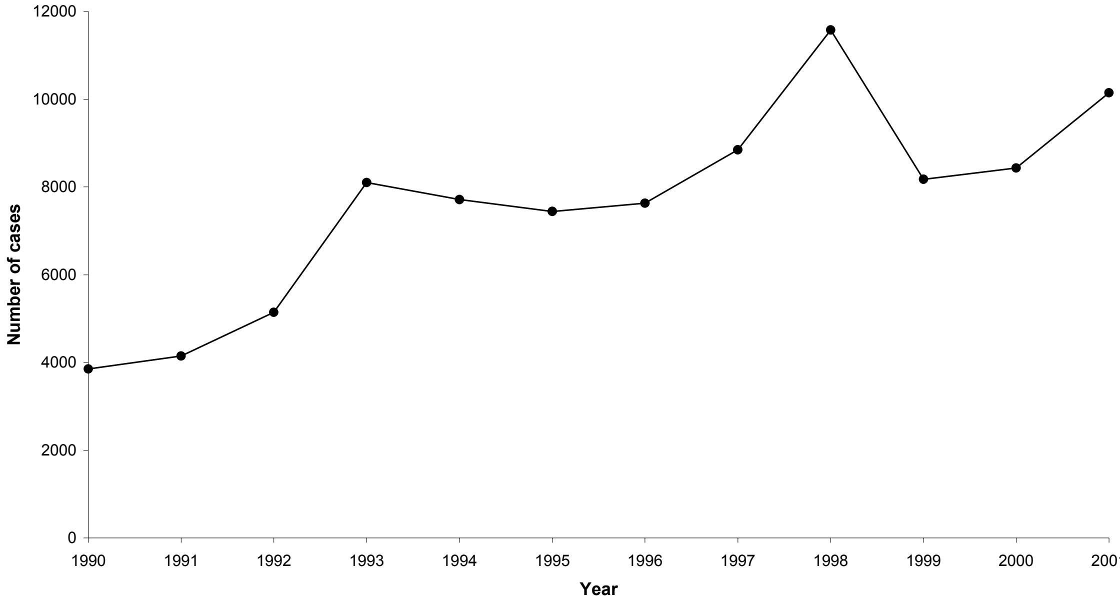
Campylobacteriosis

A total of 10 148 cases of campylobacteriosis was notified in 2001. The 2001 rate of 271.5 per 100 000 was significantly (Chi-square, $p<0.001$) higher than the 2000 rate of 225.3. Campylobacteriosis continued to be the most commonly notified disease in 2001 with 48.5 % (or 10148 / 20913) of total notifications. Of the 6356 cases for whom hospitalisation status was recorded, 393 (6.2%) were hospitalised. One death from campylobacteriosis was also reported. The case was an 81 year old male from Canterbury Health District.

A total of 56 outbreaks of campylobacteriosis was reported in 2001, involving 301 cases. The outbreaks were reported from 15 health districts. The majority (30/56) of outbreaks was reported from the combined Auckland health districts.

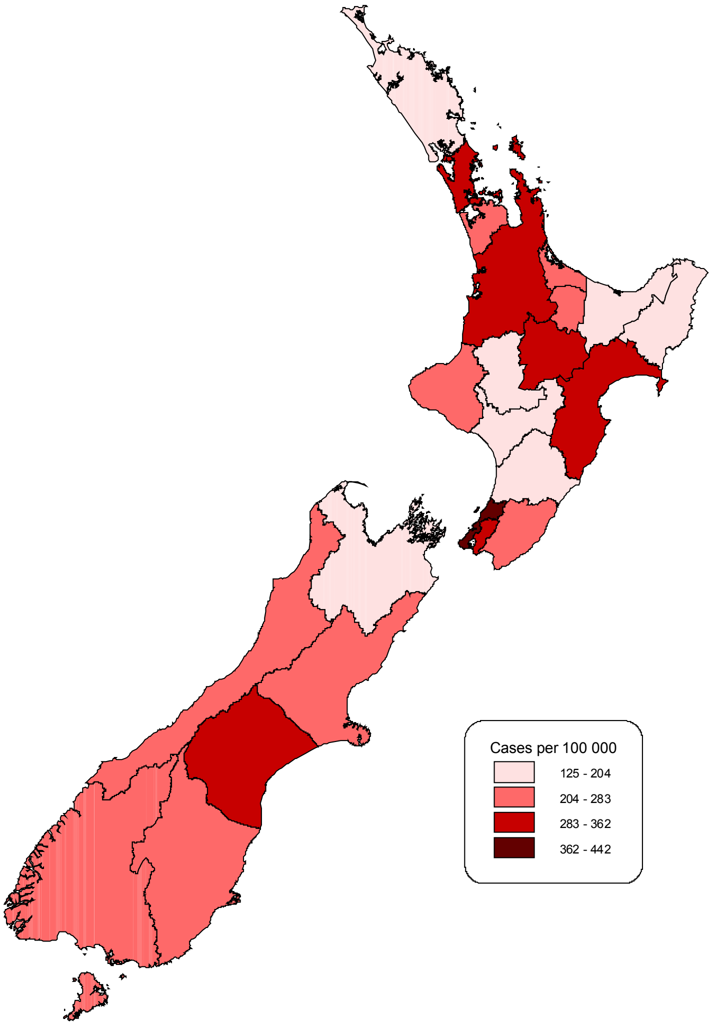
The following graph shows the number of campylobacteriosis notifications each year since 1990.

Campylobacteriosis notifications by year, 1990 - 2001



The rate of campylobacteriosis varied throughout the country. Rates higher than the national average were recorded in Wellington (441.5 per 100 000), South Canterbury (353.2), Hutt (336.7), Waikato (335.0), Taupo (314.2), Hawkes Bay (293.3), North West Auckland (288.3), Central Auckland (287.4), and Taranaki (283.1) health districts.

The following map shows the rates of campylobacteriosis by health district.



The following table shows the distribution of campylobacteriosis cases by age group and ethnicity. Age was recorded for 99.3% of campylobacteriosis notifications during 2001. The peak age-specific rate for notified campylobacteriosis occurred among children aged 1-4 years (534.8 cases per 100 000 population). This age group also experienced the largest increase in age-specific rate of campylobacteriosis, from 458.9 in 2000 to 534.8 in 2001.

Ethnicity was recorded for 78.5% (7962/10148) of campylobacteriosis notifications during 2001. As in previous years, the highest rate of notified campylobacteriosis in 2001 occurred among those of European ethnicity (272.8). Gender was recorded for 9973 (98.3%) of the 10 148 cases. Of these, 5350 cases (53.6%) were male and 4623 (46.4%) were female.

Campylobacteriosis notifications by age group and ethnicity, 2001

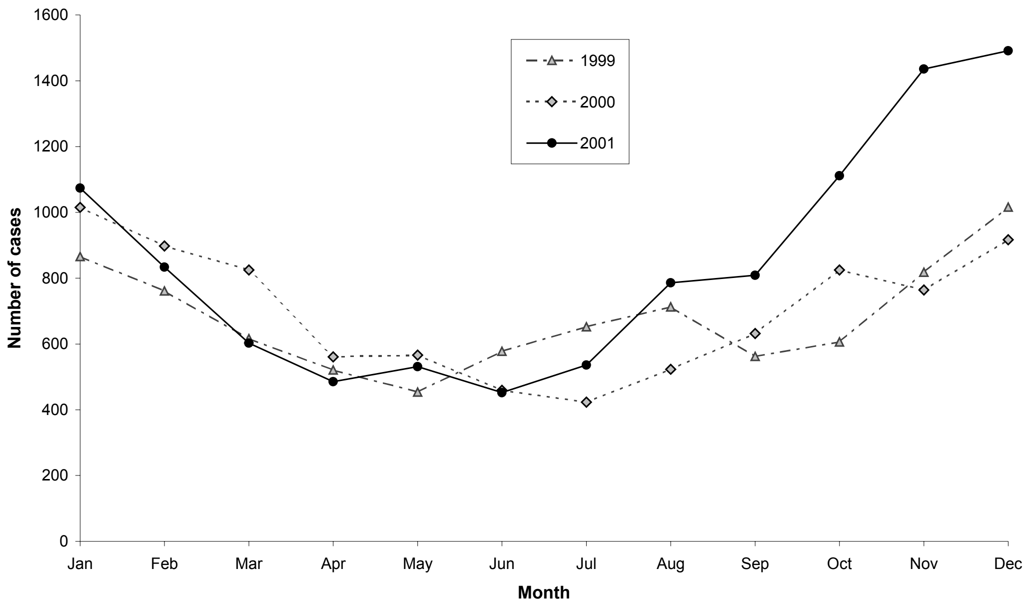
Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	124	416.8	8	57.2	6	116.3	12	322.8	52	202	369.7
1-4	730	600.1	72	134.5	30	156.5	67	477.6	257	1156	534.8
5-9	355	210.2	18	27.2	8	33.9	28	152.3	168	577	201.6
10-14	259	146.0	18	28.6	13	60.0	30	148.8	112	432	148.5
15-19	443	276.0	35	70.6	15	82.7	29	103.6	146	668	251.8
20-29	1233	403.5	91	110.6	19	56.2	62	142.6	414	1819	373.7
30-39	1118	281.5	43	55.4	14	44.1	45	98.4	318	1538	266.6
40-49	981	246.7	21	36.2	12	55.0	42	111.1	221	1277	237.6
50-59	812	242.7	27	81.3	3	22.5	16	81.9	234	1092	261.0
60-69	492	212.0	9	46.1	7	93.6	13	117.8	135	656	232.2
70+	541	188.2	6	62.0	7	158.4	6	107.0	95	655	203.1
Unknown	40	-	0	-	1	-	1	-	34	76	-
Total	**7128**	**272.8**	**348**	**66.1**	**135**	**67.4**	**351**	**141.8**	**2186**	**10148**	**271.5**

1 Crude rate per 100 000, based on 2001 Census

Among the 10 148 notified cases, 7.6% (379 of the 4976 for which this information was recorded) had been overseas during the incubation period, 16.9% (690/4078) had recreational water contact, 24.6% (883/3589) had consumed untreated water, 35.6% (1549/4357) had contact with farm animals, and 12.7% (529/4180) had contact with other symptomatic cases during the incubation period.

The following graph shows campylobacteriosis notifications by month since 1999. It demonstrates the seasonality of campylobacteriosis incidence and the marked peak in notifications during summer, 2001/2002.

Campylobacter notifications by month, January 1999 - December 2001



Chemical poisoning

Three cases of chemical poisoning were notified in 2001, compared to one case notified during 2000. All 2001 cases were from the Waikato Health District. Two cases were European; the other was of unknown ethnicity.

An 88 year-old female had laboratory-confirmed elevated copper levels. The suspected source of the contaminant was thought to have been water via old pipes in the home. A 52 year-old female reported symptoms from fumes, presumably emitted from a nearby asphalt plant. A 71 year-old female attributed symptoms to a chemical-type odour in her home, although the source was never identified.

Cholera

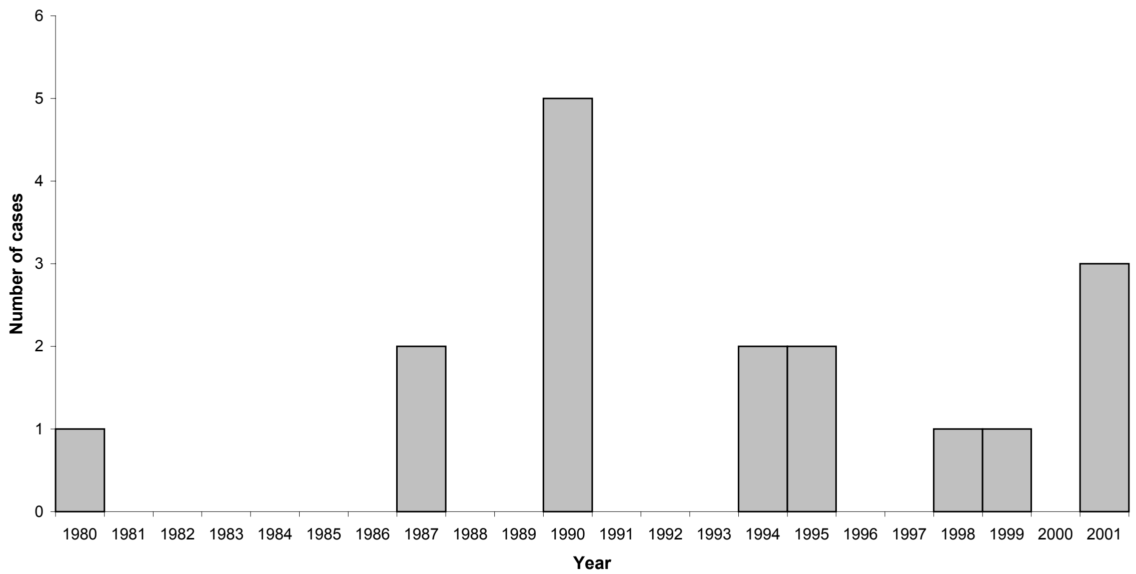
There were three confirmed cases of *Vibrio cholerae* O1 notified in 2001. This brings the total number of cases of cholera notified since 1980 to seventeen.

The 2001 cases were males, aged 28, 38, and 53 years old. All three had been overseas during the incubation period, to India, China, and Bali respectively. Swimming pools in Bali and tap water in India were the implicated sources. The two previously notified cases (in 1998 and 1999) had both travelled to Fiji.

One of the three cases in 2001 was hospitalised.

The following graph shows the number of notified cases of cholera each year since 1980.

Cholera notifications by year,
1980 - 2001



Creutzfeldt-Jakob disease

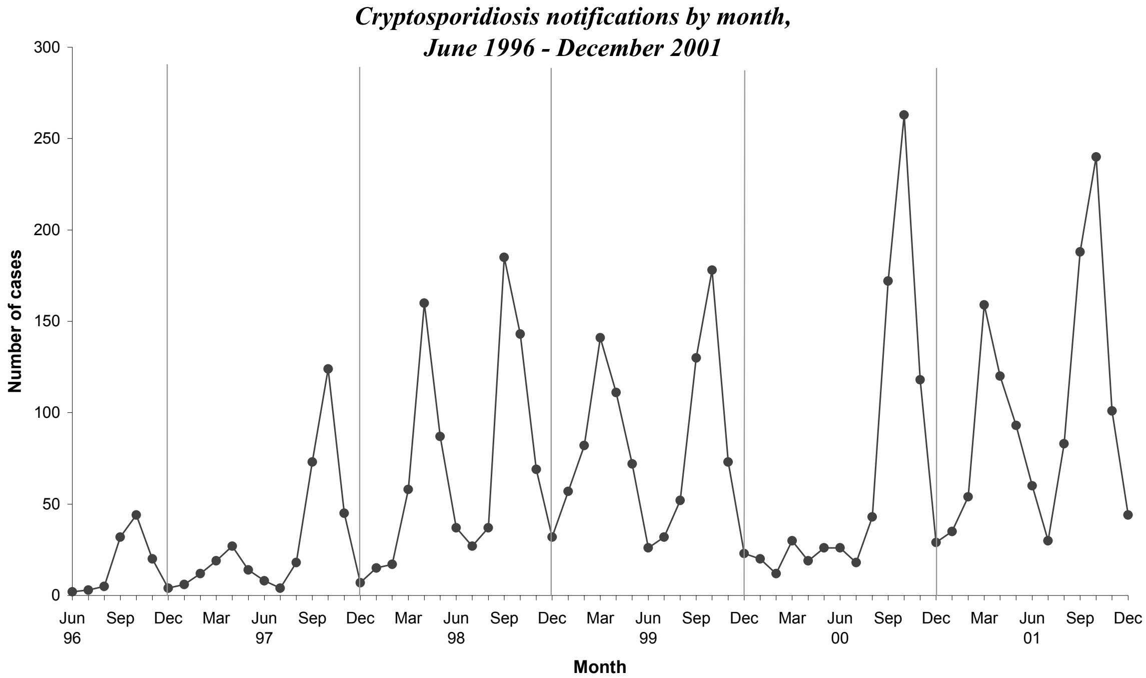
One case of Creutzfeldt-Jakob disease (CJD) was notified in 2001. In contrast during 2000, three confirmed cases were notified. The 2001 case, a 74 year-old female from Canterbury Health District, was confirmed by prion protein histochemistry at post mortem. The case was typical of the sporadic form of CJD and had no features suggestive of new variant CJD.

Cryptosporidiosis

A total of 1207 cases of cryptosporidiosis was notified in 2001. The 2001 rate of 32.3 per 100 000 was significantly (Chi-square, $p<0.001$) higher than the 2000 rate of 20.7. Of the 964 cases for whom hospitalisation status was recorded, 40 (4.1%) were hospitalised.

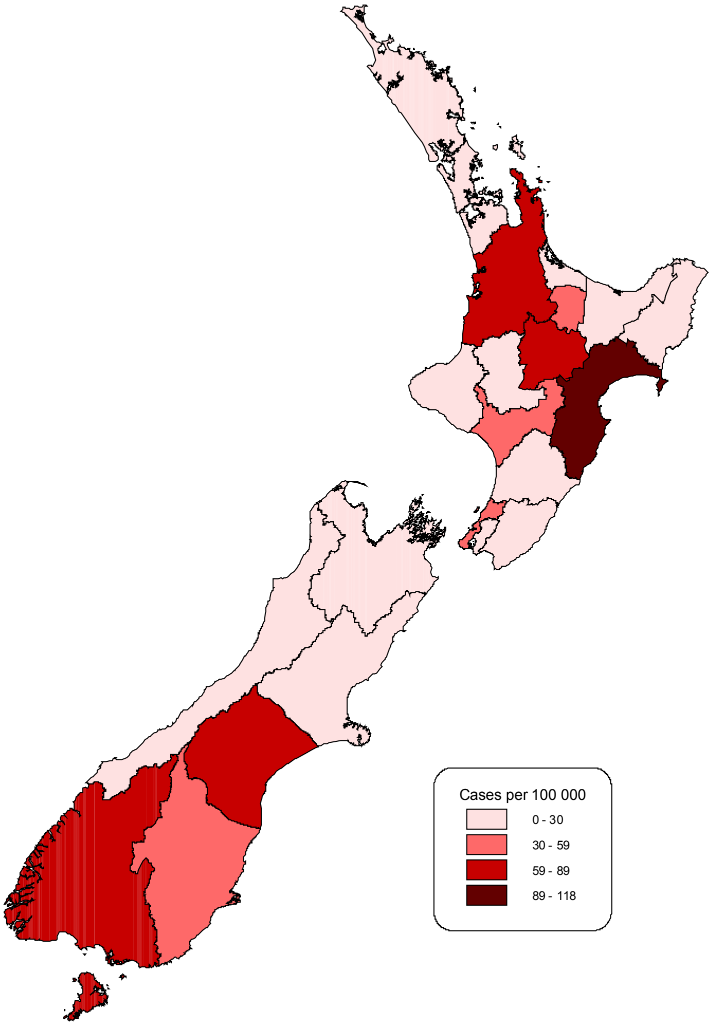
A total of 27 outbreaks of cryptospiridiosis was reported in 2001, from the Hawkes Bay, Waikato, Manawatu, Wanganui, Wellington, West Coast, Taupo, Canterbury, Otago, South Auckland, and Rotorua health districts. Together they accounted for 147 cases.

The following graph shows cryptosporidiosis cases by month since the disease became notifiable in June 1996.



The rate of cryptosporidiosis varied throughout the country in 2001. Rates higher than the national average were recorded in Hawkes Bay (118.4 per 100 000), Taupo (76.2), South Canterbury (66.5), Southland (62.0), Waikato (61.2), Wanganui (56.5), Otago (39.1), Wellington (37.4), and Rotorua (37.2) health districts.

The following map shows the rates of cryptosporidiosis by health district.



The following table shows the distribution of cryptosporidiosis cases by age group and ethnicity. Gender was recorded for 1191 (98.7%) of the 1207 cases. Of these, 589 cases (49.5%) were male and 602 (50.5%) were female.

Cryptosporidiosis notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	36	121.0	7	50.0	1	19.4	2	53.8	7	53	97.0
1-4	402	330.5	58	108.3	8	41.7	10	71.3	64	542	250.7
5-9	135	79.9	10	15.1	2	8.5	10	54.4	26	183	64.0
10-14	54	30.4	5	8.0	1	4.6	3	14.9	12	75	25.8
15-19	28	17.4	3	6.1	1	5.5	0	0.0	12	44	16.6
20-29	67	21.9	14	17.0	0	0.0	1	2.3	27	109	22.4
30-39	94	23.7	3	3.9	2	6.3	2	4.4	14	115	19.9
40-49	31	7.8	1	1.7	0	0.0	0	0.0	8	40	7.4
50-59	18	5.4	1	3.0	0	0.0	0	0.0	1	20	4.8
60-69	10	4.3	1	5.1	0	0.0	0	0.0	0	11	3.9
70+	10	3.5	0	0.0	1	22.6	0	0.0	1	12	3.7
Unknown	3	-	0	-	0	-	0	-	0	3	-
Total	**888**	**34.0**	**103**	**19.6**	**16**	**8.0**	**28**	**11.3**	**172**	**1207**	**32.3**

[1] Crude rate per 100 000, based on 2001 census

Among the 1207 notified cases, 39.1% (357 of the 912 cases for which this information was recorded) had recreational water contact, 36.1% (284/786) had consumed untreated water, and 51.7% (499/965) had contact with farm animals, 19.0% (138/725) had contact with sick animals, and 34.1% (301/882) had contact with other symptomatic cases during the incubation period.

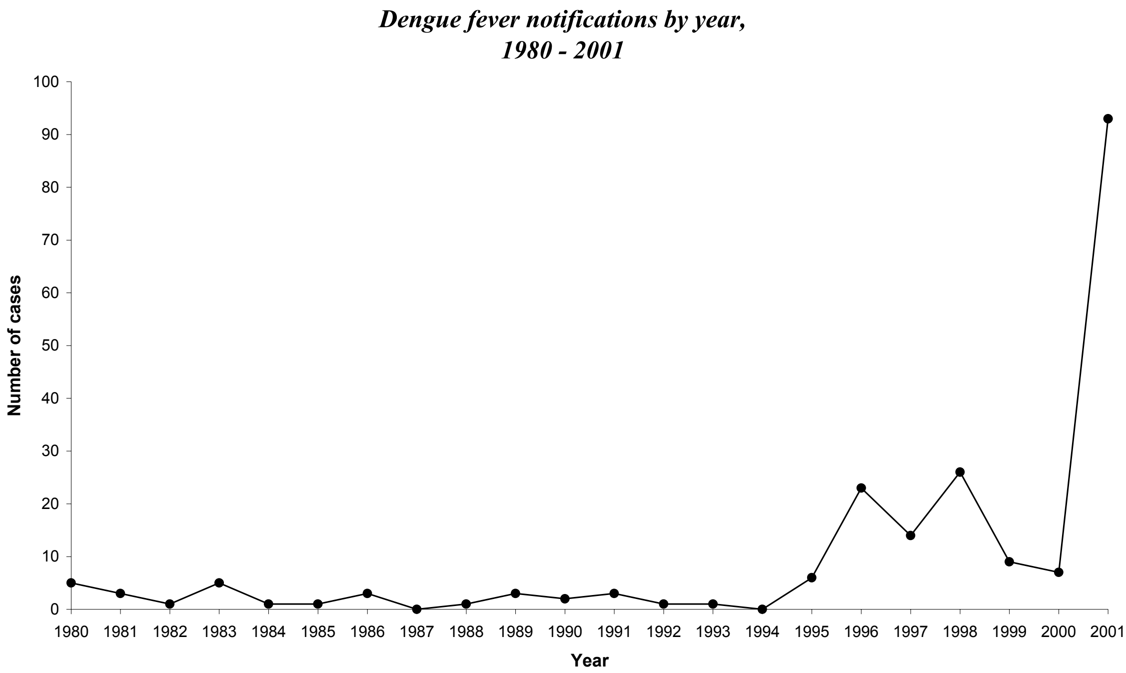
Dengue fever

Ninety-three cases of dengue fever were notified in 2001. This total is the highest number of notifications reported in any single year. The 2001 rate of 2.5 per 100 000 was significantly (Chi-square, $p<0.001$) higher than the 2000 rate of 0.2.

Hospitalisation status was recorded for 84 cases and of these, 25.0% (21/84) were hospitalised.

Forty-one cases (44.1%) were male and 52 (55.9%) were female. Ethnicity was recorded for 83 cases: 48 were European, two were Maori, 29 Pacific People, and four of ‘Other’ ethnicity.

The following graph shows dengue fever notifications by year since 1980.



The reason for travel was recorded for 92.5% (86/93) of the cases. Of these, 78 cases were New Zealanders travelling overseas on business or holiday[1], and eight were overseas visitors to New Zealand. Travel information was recorded for seven of the eight overseas visitors. Four had been in Samoa, two reported travel to French Polynesia, and one to Thailand.

The following table shows rates of dengue among New Zealanders travelling overseas on business or holiday, and the country/region where the disease was most probably acquired.

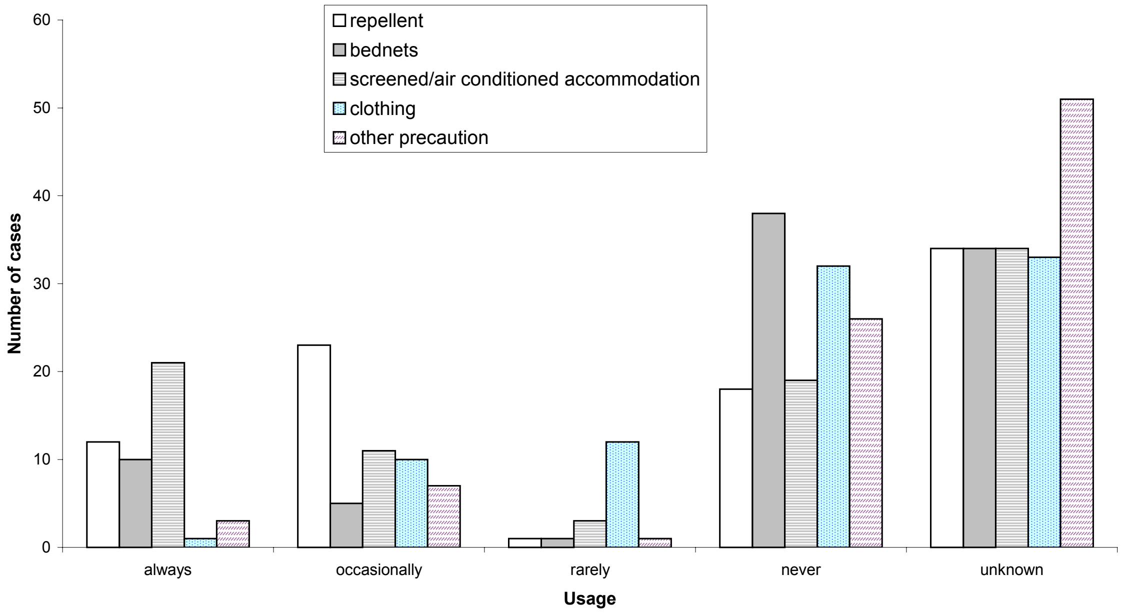
Rates of dengue and country/region where infection probably acquired: New Zealanders travelling overseas on holiday and business, 2001

Country / region	Cases	Travellers	Rate (per 100 000 visits)
Pacific Islands			
Cook Islands	1	19909	5.0
French Polynesia	6	4075	147.2
Fiji	1	63078	1.6
Samoa	52	14866	349.8
Tokelau	3	194	1546.4
South East Asia			
East Timor	3	928	323.3
Indonesia	5	16740	29.9
India	1	8959	11.2
Philippines	2	4068	49.2
Sri Lanka	1	1928	51.9
Thailand	3	18046	16.6
Total	**78**	152791	51.1

[1] *Three of the 78 cases had been overseas for more than a year.*

Information on precautionary measures (including use of insect repellent, bednets, screened or air conditioned accommodation, wearing of long sleeved shirts and trousers) was recorded for 58.1% (54/93) of cases. The following graph shows the use of precautionary measures among dengue fever cases notified during 2001.

Reported use of protective measures among dengue fever cases notified in 2001



Echovirus type 13

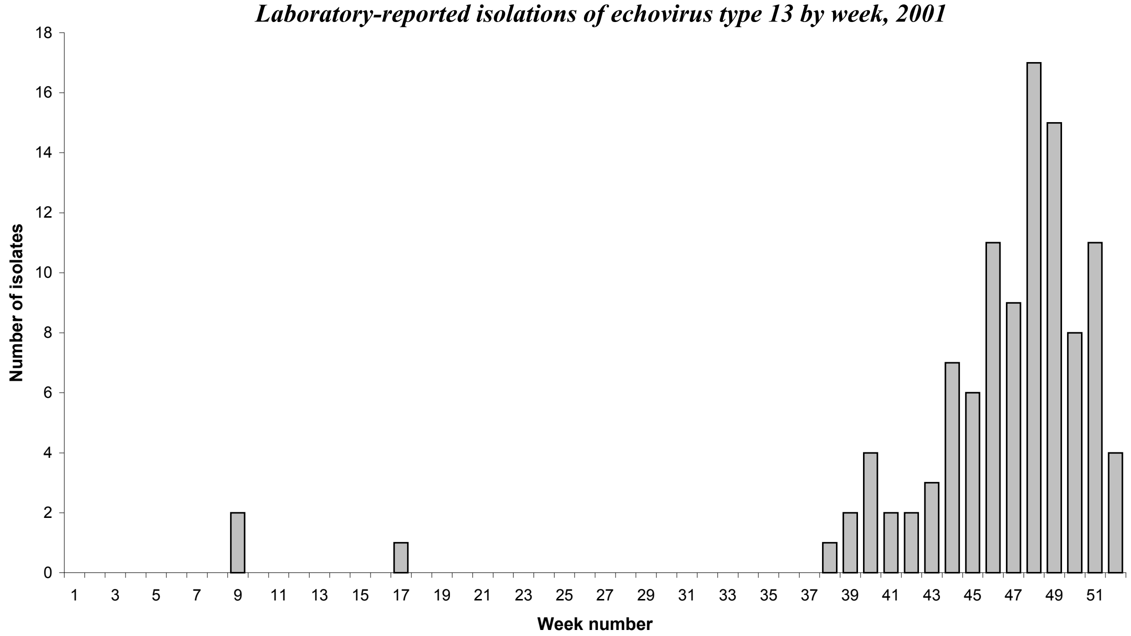
Echovirus type 13 (E13) is an enterovirus that has rarely been detected worldwide. Historical review of echovirus isolations in ESR revealed that no E13 isolations during the period 1975 to 2000. However, an outbreak of echovirus type 13 occurred during 2001, during which time a total of 105 isolations were obtained. Cases' symptoms included rash, fever, photophobia, and viral meningitis. The index case was a two-month old boy from Waikato presenting with meningitis symptoms, whose specimen was taken in February 2001.

The E13 isolates (105) were identified from Waikato (59), Auckland (17), and Wellington (19), Christchurch (4), Dunedin (2), Manawatu (2), Taranaki (1) and Wairarapa (1). Patients ages ranged from 10 days to 39 years old (average 8.6 years). Male (64) to female (41) ratio was 1.6:1. Symptoms were rash, fever, photophobic, and viral meningitis.

In 2001, the United States experienced a viral meningitis outbreak caused by echovirus 13. Echovirus 13 has rarely been detected in the United States, accounting for only 65 of approximately 45 000 enterovirus isolates reported to CDC during the period 1970 to 2000. No associated outbreaks have been reported in this country. As of 14 Aug 2001, echovirus 13 has been isolated in specimens from 76 patients in 13 states, most associated with aseptic meningitis[11]. Increased echovirus 13 activity was also reported in Europe during 2000, when echovirus 13 was associated for the first time with outbreaks of aseptic meningitis in England, Wales, and Germany.[12, 13] Also, increased echovirus 13 activity has been reported in Western Australia[14] and Singapore (personal communications.). Because echovirus 13 has rarely been isolated, the spectrum of disease associated with this virus has not been well established. Conditions previously associated with echovirus 13 are typical of enterovirus infections and include asymptomatic carriage, mild febrile illness, aseptic meningitis, respiratory diseases (e.g., coryza, pharyngitis, bronchitis, and bronchiolitis), poliomyelitis-like illness, diarrhoea with fever, rash, encephalitis, and enteroviral sepsis. Aseptic meningitis is the predominant illness associated with the current echovirus 13 activity in the United States and with echovirus activity reported in Europe in 2000.

The following graph shows the number of isolations of E13 each week during 2001.

Laboratory-reported isolations of echovirus type 13 by week, 2001



Although the E13 outbreak appears to have peaked in November 2001, it is still ongoing, with specimens continuing to be forwarded to the ESR Virology Lab during 2002.

The enterovirus surveillance is a year-round routine diagnostic surveillance for hospital in-patients and outpatients. Hospital laboratories report all enterovirus isolations and/or typing results weekly to ESR and this data is then available nationally. Untyped or untypable enteroviruses are referred to ESR for identification.

Gastroenteritis

Until mid 2000, cases of gastroenteritis had been reported according to the case definition for acute gastroenteritis.[1] Since July 2000, public health services have also been encouraged to record all cases of gastroenteritis caused by non-notifiable or unknown foodborne intoxicants, in addition to all cases of viral gastroenteritis that may be part of an outbreak.

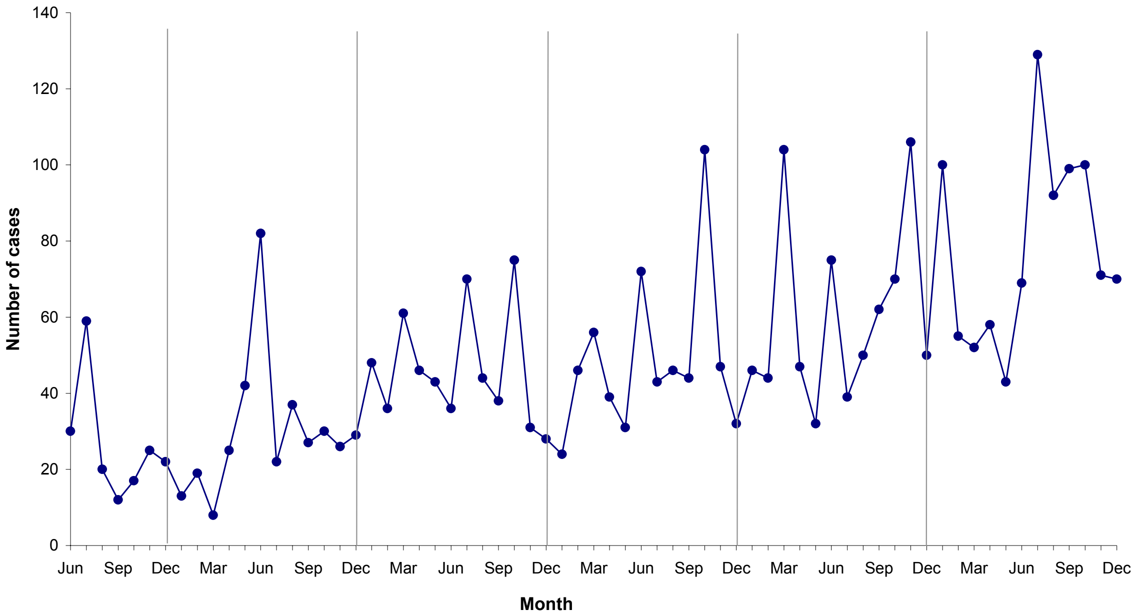
A total of 938 cases of gastroenteritis was notified in 2001.[2] The 2001 rate of 25.1 per 100 000 was significantly (Chi-square, $p<0.001$) higher than the 2000 rate of 19.4. Of the 766 cases for whom hospitalisation status was recorded, 29 (3.8%) were recorded as having been hospitalised.

[1] *Defined as a case of acute gastroenteritis where either (i) a common source was suspected; or (ii) the case was in a high risk category, or (iii) the case suffered from chemical, bacterial, or toxic food poisoning.*
[2] *The information reported here as 'acute gastroenteritis/gastroenteritis' excludes cases of enteric disease that are notifiable in their own right (e.g. salmonellosis or campylobacteriosis) and also excludes cases of toxic shellfish poisoning (TSP).*

Gender was recorded for 917 (97.8%) of the 938 cases. Of these, 361 cases (39.4%) were male and 556 (60.6%) were female.

The following graph shows gastroenteritis cases by month since the disease became notifiable in June 1996**.**

Gastroenteritis notifications by month, June 1996 - December 2001



Of the 938 gastroenteritis reported in 2001, an identified pathogen was recorded for 186 cases. The three most commonly identified pathogens were Norwalk-like virus (106 cases), rotavirus (49), and *Clostridium perfringens* (16).

Enteric disease outbreaks reported during 2001 included 45 due to NLV, 13 due to *Clostridium perfringens*, 11 due to *Staphylococcus aureus*, 6 due to *Bacillus cereus*, three due to rotavirus, as well as 125 specified as outbreaks of gastroenteritis without any microbiological agent identified.

Among the 938 notified cases, 33.5% (167 of the 498 cases for whom this information was recorded) reported contact with another symptomatic case, 15.8% (57/360) had contact with faecal matter, 12.1% (57/471) had consumed untreated water, and 4.6% (21/456) had recreational water contact. Cases in high risk categories included the following: 44 health workers, 27 intellectually or physically impaired persons, and 18 food handlers.

Eighty-one cases (56.6% or 81/143) were identified as being part of a common source outbreak. The definite or suspect source of infection was recorded as being via person-to-person contact for 153 (16.3%) cases, and through contact with contaminated food or drink for 420 (44.8%) cases.

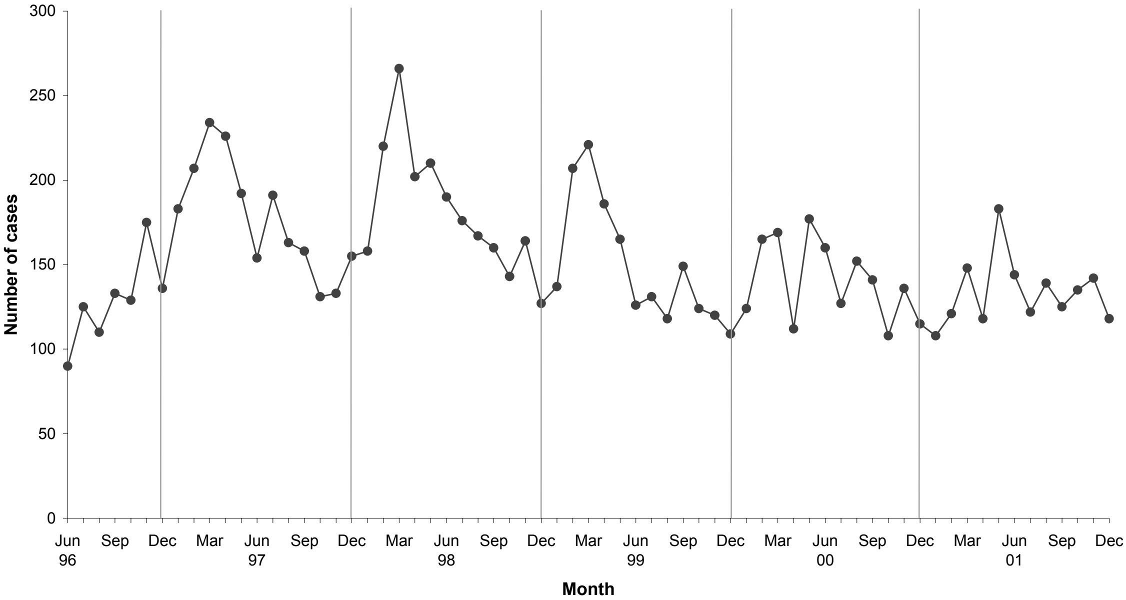
Giardiasis

A total of 1603 cases of giardiasis was notified in 2001. The 2001 rate of 42.9 cases per 100000 is slightly lower than the 2000 rate of 45.1. Of the 1120 cases for whom hospitalisation status was recorded, 15 (1.3%) were hospitalised.

A total of 18 outbreaks of giardiasis was reported in 2001, from the Hawkes Bay, Manawatu, Nelson Marlborough, West Coast, Taupo, Otago, North West Auckland, South Auckland, Waikato, Tauranga, Bay of Plenty, and Gisborne health districts. Together they accounted for 75 cases.

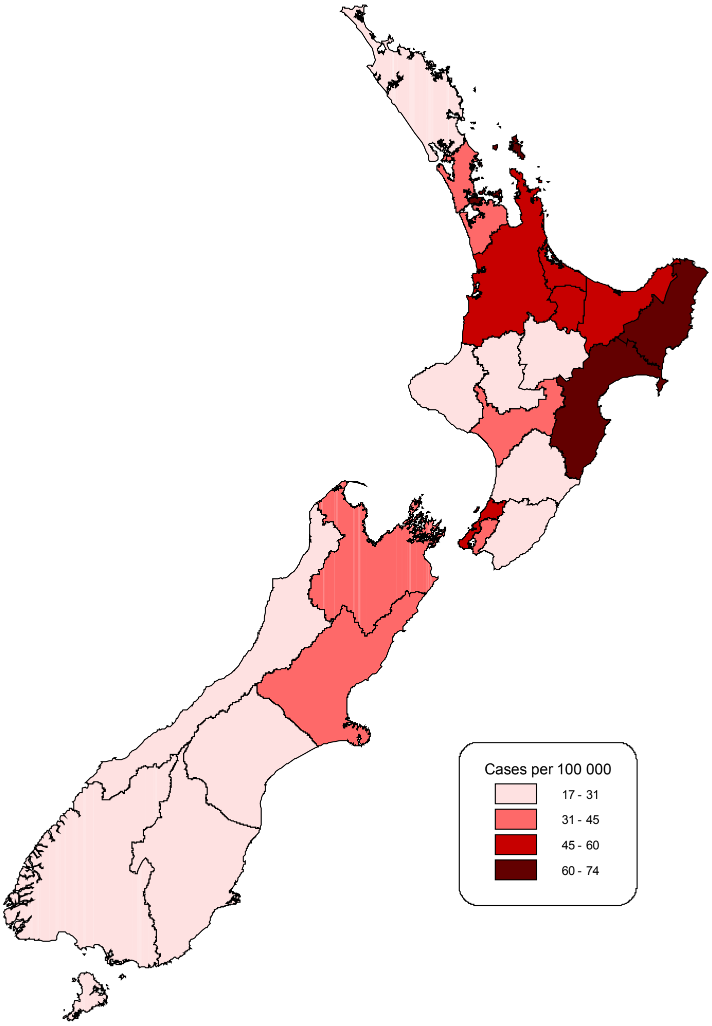
The following graph shows giardiasis cases by month since the disease became notifiable in June 1996.

Giardiasis notifications by month, June 1996 - December 2001



The rate of giardiasis varied throughout the country in 2001. Rates higher than the national average were recorded in Hawkes Bay (78.3 per 100 000), Gisborne (63.7), Central Auckland (62.5), Bay of Plenty (59.1), Wellington (57.9), Tauranga (53.4), Waikato (48.3), Rotorua (46.5), and North West Auckland (45.1) health districts.

The following map shows the rates of giardiasis by health district.



The following table shows the distribution of giardiasis cases by age group and ethnicity. Gender was recorded for 1567 (97.8%) of the 1603 cases. A total of 836 cases (53.4%) were male and 731 (46.6%) were female.

Giardiasis notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	23	77.3	2	14.3	1	19.4	0	0.0	5	31	56.7
1-4	265	217.8	37	69.1	5	26.1	21	149.7	50	378	174.9
5-9	78	46.2	4	6.0	2	8.5	9	48.9	30	123	43.0
10-14	23	13.0	3	4.8	0	0.0	3	14.9	13	42	14.4
15-19	19	11.8	2	4.0	0	0.0	9	32.1	9	39	14.7
20-29	92	30.1	9	10.9	0	0.0	28	64.4	35	164	33.7
30-39	301	75.8	16	20.6	5	15.8	11	24.1	66	399	69.2
40-49	146	36.7	4	6.9	1	4.6	11	29.1	36	198	36.8
50-59	83	24.8	2	6.0	0	0.0	4	20.5	27	116	27.7
60-69	54	23.3	2	10.2	0	0.0	0	0.0	11	67	23.7
70+	27	9.4	0	0.0	0	0.0	1	17.8	2	30	9.3
Unknown	6	-	1	-	0	-	1	-	8	16	-
Total	**1117**	**42.8**	**82**	**15.6**	**14**	**7.0**	**98**	**39.6**	**292**	**1603**	**42.9**

[1] Crude rate per 100 000, based on 2001 census

Among the 1603 notified cases, 33.8% (230 of the 681 cases for which this information was recorded) had consumed untreated water, 34.3% (270/788) indicated recreational contact with water, 48.1% (356/740) had contact with children in nappies or other faecal matter, and 38.1% (305/801) had contact with other symptomatic cases during the incubation period.

Haemophilus influenzae **serotype b disease**

Fourteen cases of *haemophilus influenzae* serotype b (Hib) disease were notified in 2001. Of these, eight were laboratory confirmed by ESR Invasive Pathogens Laboratory as Hib; one case was confirmed as *haemophilus influenzae* type II (at ESR); and two were recorded on EpiSurv as 'probable' cases of Hib. The confirmation status of the remaining three cases (all notified from Southland Health District) is as yet unknown. In comparison, 13 cases of Hib were notified during 2000. Isolates from 10 of these cases were confirmed at ESR, and isolates from an additional two were evidently confirmed elsewhere.

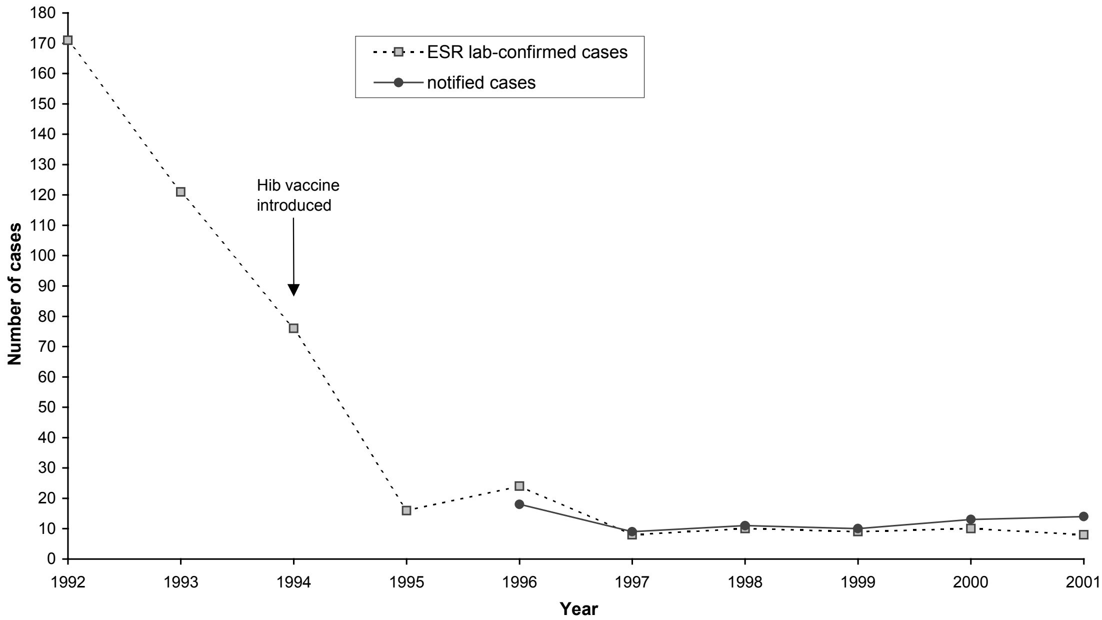
Of the eight laboratory confirmed cases of Hib in 2001, two were aged less than one year, three were in the 1-4 years age group, and the remaining two were over 30 years of age. One 'probable' case was in the 1-4 years age group and the other was in the 15-19 years age group.

Gender was recorded for all 14 notified cases in 2001: ten were female and four were male.

Hospitalised information was recorded for ten cases in 2001. All ten cases were hospitalised.

The following graph shows the number of ESR laboratory-confirmed cases of Hib since 1992, along with the number of notified cases of Hib each year since 1996[1].

Hib ESR laboratory-confirmed and notified cases by year 1992 - 2001

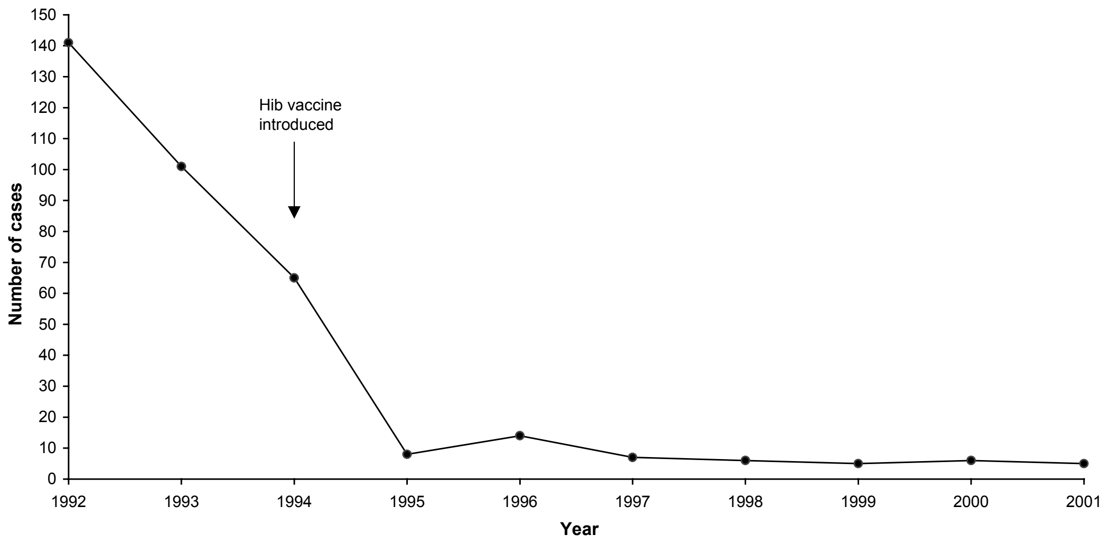


A Hib vaccine was introduced in January 1994. Prior to August 2000, the recommended immunisation schedule consisted of four doses of DTPH vaccine given at six weeks, three months, five months, and fifteen months of age. The new schedule introduced in mid August 2000, and continuing throughout 2001, recommended three doses of Hib vaccine at six weeks, three months and a booster at 15 months.

[1] *Hib first became notifiable in June 1996.*

The following graph illustrates trends in the number of ESR lab-confirmed cases of Hib in children aged five years or less since 1992.

ESR laboratory-confirmed cases of Hib disease in children <5 years of age, by year, 1992 - 2001



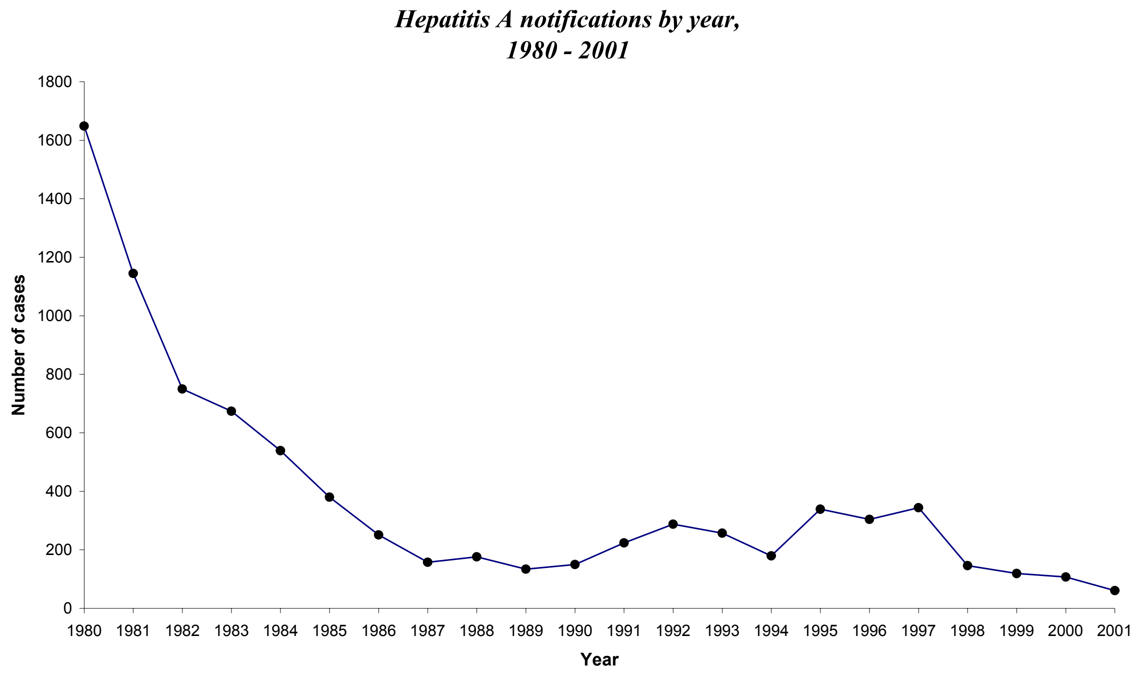
Three confirmed cases of Hib during 2001 had been immunised against the disease: a 12 month old child received the first dose, and children aged four and eight years received all three doses. All other confirmed cases were recorded as not having been immunised.

Hepatitis A

A total of 61 cases of hepatitis A was notified in 2001. The 2001 rate of 1.6 per 100 000 was significantly (Chi-square, $p<0.001$) lower than the 2000 rate of 2.9. Of the 61 cases for whom hospitalisation status was recorded, 12 (19.7%) were hospitalised.

Three outbreaks of hepatitis A were reported in 2001, from Central Auckland, South Auckland, and Gisborne health districts. Together they accounted for 11 cases.

The following graph shows hepatitis A notifications since 1980.



The rate of hepatitis A varied throughout the country. Rates higher than the national average were recorded in South Auckland (6.9 per 100 000), Gisborne (4.6), Central Auckland (3.8), Wairarapa (2.6) and Wellington (2.4) health districts.

The following table shows the distribution of cases of hepatitis A by age group and ethnicity. Gender was recorded for all cases. Of these, 33 cases (54.1%) were male and 28 (45.9%) were female.

Hepatitis A notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
1-4	0	0.0	2	3.7	3	15.6	0	0.0	0	5	2.3
5-9	0	0.0	3	4.5	5	21.2	3	16.3	0	11	3.8
10-14	0	0.0	0	0.0	6	27.7	1	5.0	0	7	2.4
15-19	1	0.6	0	0.0	3	16.5	1	3.6	1	6	2.3
20-29	3	1.0	2	2.4	1	3.0	3	6.9	0	9	1.8
30-39	2	0.5	0	0.0	1	3.2	1	2.2	0	4	0.7
40-49	4	1.0	1	1.7	1	4.6	0	0.0	1	7	1.3
50-59	7	2.1	1	3.0	0	0.0	0	0.0	0	8	1.9
60-69	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
70+	4	1.4	0	0.0	0	0.0	0	0.0	0	4	1.2
Unknown	0	-	0	-	0	-	0	-	0	0	-
Total	**21**	**0.8**	**9**	**1.7**	**20**	**10.0**	**9**	**3.6**	**2**	**61**	**1.6**

1 Crude rate per 100 000, based on 2001 Census

The following table provides a summary of risk factor information for hepatitis A in 2001. Some cases had more than one risk factor recorded, and five cases had no obvious risk factors recorded. The same number (24) of hepatitis A cases in 2001 reported a history of overseas travel during the incubation period as in 2000. Fewer cases were recorded as having consumed suspected or definitely contaminated food or water in 2001 (10) than in 2000 (15). Sexual contact involving possible faecal-oral contact was recorded as a risk factor for fewer cases in 2001 (2) than in 2000 (20).

Risk factors associated with hepatitis A, 2001

Risk Factor	Yes	No	Unk	Proportion[1]
Overseas travel during incubation period	24	30	7	44.4%
Consumed suspected/definite contaminated food/water	10	26	25	27.8%
Household contact with case	9	40	12	18.4%
Exposed to human sewage	8	45	8	15.1%
Sexual contact involving possible faecal-oral transmission or contact	2	46	13	4.2%

1 "Proportion" refers to the percentage of cases who answered "yes" out of the total number of cases where this information was known

Of the 54 cases for whom overseas travel information was recorded, 24 (42.6%) had been overseas during the incubation period. The most commonly visited countries were Tonga (5), Australia, Indonesia, Singapore (3 each), China (2), Ecuador, Fiji, Hawaii, Kiribati, United Kingdom, Malaysia, Samoa, and Switzerland (1 each). The following table shows the rates of hepatitis A among New Zealanders travelling overseas and the countries/regions visited. The highest rates of infection occurred among travellers to Southeast Asia (10.0 cases per 100 000 visits) or to South America (18.6), although the rate for South America should be interpreted with caution is it is based on only one case.

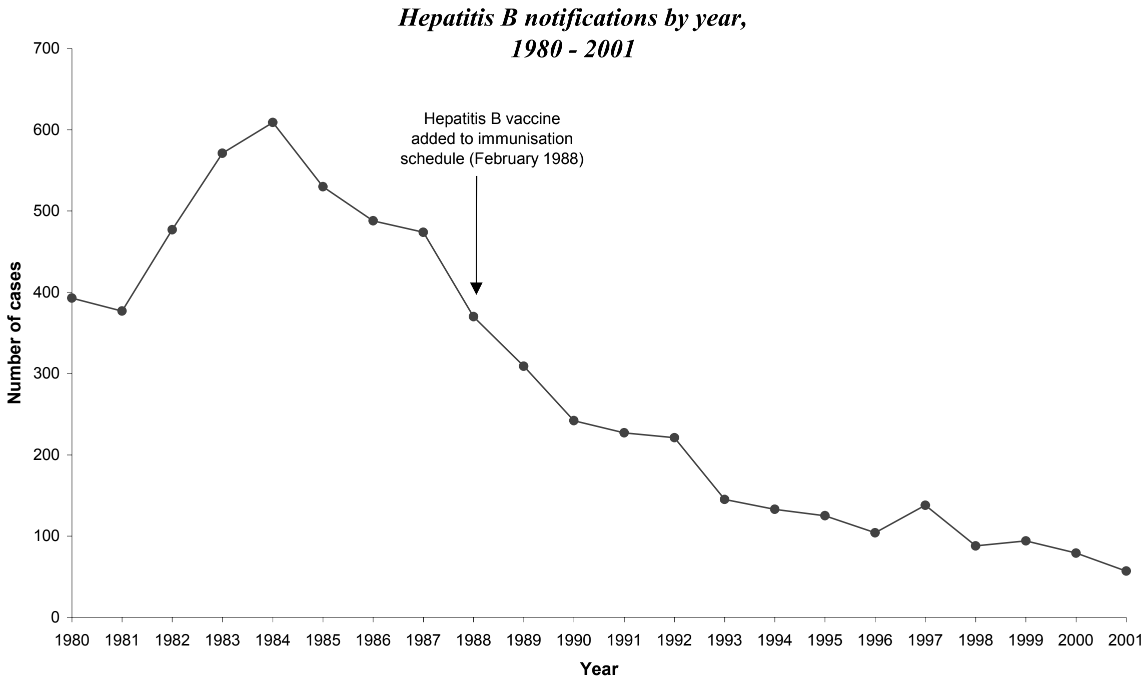
Rate of hepatitis A among New Zealanders travelling overseas and the countries/regions visited, 2001

Country / region	Cases	Travellers	Rate (per 100 000 visits)
Australia	3	682530	0.4
Oceania and Antarctica	8	127675	6.3
North West Europe	2	87819	2.3
North East Asia	2	80035	2.8
South East Asia	7	69904	10.0
South America	1	5386	18.6
Northern America	1	78797	1.3
Total	**24**	1132146	2.1

Hepatitis B

A total of 57 cases of hepatitis B was notified in 2001. The 2001 rate of 1.5 per 100 000 was lower than the 2000 rate of 2.1. Of the 46 cases for whom hospitalisation status was recorded, 15 (32.6%) were hospitalised. There was one death reported from hepatitis B.

The following graph shows hepatitis B notifications by year since 1980.



The rates of hepatitis B varied throughout the country in 2001. Rates higher than the national average of 1.5 per 100 000 were recorded in Wairarapa (7.8 per 100 000), West Coast (6.6), Taupo (6.3), Hawkes Bay (4.2), Tauranga (3.1), Waikato (2.3), Northland (2.1), Wellington (1.6), and Hutt (1.6) health districts.

The following table shows the distribution of cases of hepatitis B by age group and ethnicity. Gender was recorded for 55 of the 57 cases. Of these 55 cases, 35 cases (63.6%) were male and 20 (36.4%) were female. One case, a 33 year-old male, was recorded as having been immunised against hepatitis B.

Hepatitis B notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific People		Other		Unknown	Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Cases	Rate
<1	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
1-4	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
5-9	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
10-14	0	0.0	0	0.0	1	4.6	0	0.0	0	1	0.3
15-19	0	0.0	1	2.0	2	11.0	1	3.6	3	7	2.6
20-29	4	1.3	9	10.9	3	8.9	1	2.3	3	20	4.1
30-39	7	1.8	2	2.6	0	0.0	0	0.0	6	15	2.6
40-49	3	0.8	0	0.0	2	9.2	1	2.6	1	7	1.3
50-59	3	0.9	2	6.0	0	0.0	0	0.0	1	6	1.4
60-69	1	0.4	0	0.0	0	0.0	0	0.0	0	1	0.4
70+	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
Unknown	0	-	0	-	0	-	0	-	0	0	-
Total	**18**	0.7	**14**	2.7	**8**	4.0	**3**	1.2	**14**	**57**	1.5

Crude rates per 100 000, based on 2001 Census

The following table provides a summary of risk factor information for hepatitis B in 2001. Several cases had more than one risk factor recorded. In addition to those risk factors listed below, other risk factors recorded were: communal living (1 case), having multiple sexual partners (1), having leukaemia (1), and being a rubbish collector (1).

Risk factors associated with hepatitis B, 2001

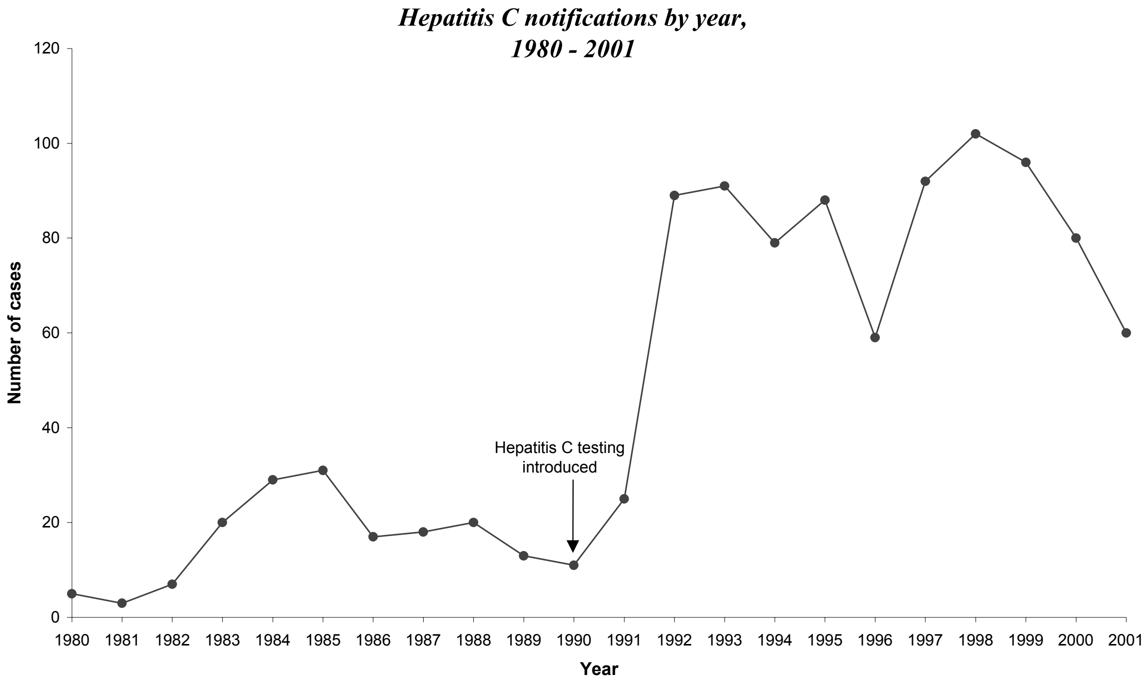
Risk Factor	Yes	No	Unk	Proportion[1]
Sexual contact with confirmed case or carrier	7	24	26	22.6%
Household contact with case	7	22	28	24.1%
Occupationally exposed to blood	6	31	20	16.2%
Body piercing or tattooing in last 12 months	1	35	21	2.8%
Blood product or tissue recipient	1	34	22	2.9%
History of injecting drug use	1	35	21	2.8%
Dialysis patient	1	35	21	2.9%
Travelled overseas during incubation period	1	36	20	2.7%

1 "Proportion" refers to the percentage of cases who answered "yes" out of the total number of cases for whom this information was known.

Hepatitis C

A total of 60 cases of hepatitis C was notified in 2001. The 2001 rate of 1.6 per 100 000 is lower than the 2000 rate of 2.1. Of the 35 cases for whom hospitalisation status was recorded, two (5.7%) were hospitalised.

The following graph shows hepatitis C notifications since 1980.



* Prior to the availability of hepatitis C testing there were cases of non A non B hepatitis

The rate of hepatitis C varied throughout the country in 2001. Rates higher than the national average of 1.6 per 100 000 were recorded in Tauranga (13.9 per 100 000), Rotorua (7.8), Taupo (6.3), Eastern Bay of Plenty (6.1), West Coast (3.3), Wellington (2.4), Gisborne and Hutt (2.3), and Southland (1.9) health districts.

The following table shows the distribution of cases of hepatitis C by age group and ethnicity. Gender was recorded for 58 of the 60 cases. Of these, 33 cases (56.9%) were male and 25 (43.1%) were female.

Hepatitis C notifications by age group and ethnicity, 2001

Age group	European		Maori		Pacific People		Other		Unknown	Total	
(years)	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Cases	Rate
<1	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
1-4	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
5-9	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
10-14	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
15-19	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
20-29	6	2.0	1	1.2	0	0.0	2	4.6	4	13	2.7
30-39	13	3.3	2	2.6	0	0.0	1	2.2	11	27	4.7
40-49	9	2.3	2	3.4	0	0.0	0	0.0	2	13	2.4
50-59	2	0.6	1	3.0	0	0.0	0	0.0	1	4	1.0
60-69	1	0.4	0	0.0	0	0.0	0	0.0	1	2	0.7
70+	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
Unknown	0	-	0	-	0	-	0	-	1	1	-
Total	**31**	1.2	**6**	1.1	**0**	0.0	**3**	1.2	**20**	**60**	1.6

Crude rates per 100 000, based on 2001 Census

The following table shows a summary of risk factor information for hepatitis C in 2001. Some cases had more than one risk factor recorded. A history of injecting drug use was an overwhelmingly important risk factor, being reported by 66.7% of new cases for whom this information was recorded. In addition to those risk factors listed below, one person reported having a promiscuous sexual partner, and one person reported recent surgery.

Risk factors associated with hepatitis C, 2001

Risk Factor	Yes	No	Unk	Proportion[1]
History of injecting drug use	26	13	21	66.7%
Sexual contact with confirmed case or carrier	7	20	33	25.9%
Household contact with confirmed case or carrier	6	14	40	30.0%
Travelled overseas during incubation period	5	18	37	21.7%
Occupational exposure to blood	5	17	38	22.7%
Body piercing or tattooing in last 12 months	4	19	37	17.4%
Blood product or tissue recipients	4	20	36	16.7%

1 Proportion" refers to the percentage of cases who answered "yes" out of the total number of cases for whom this information was known.

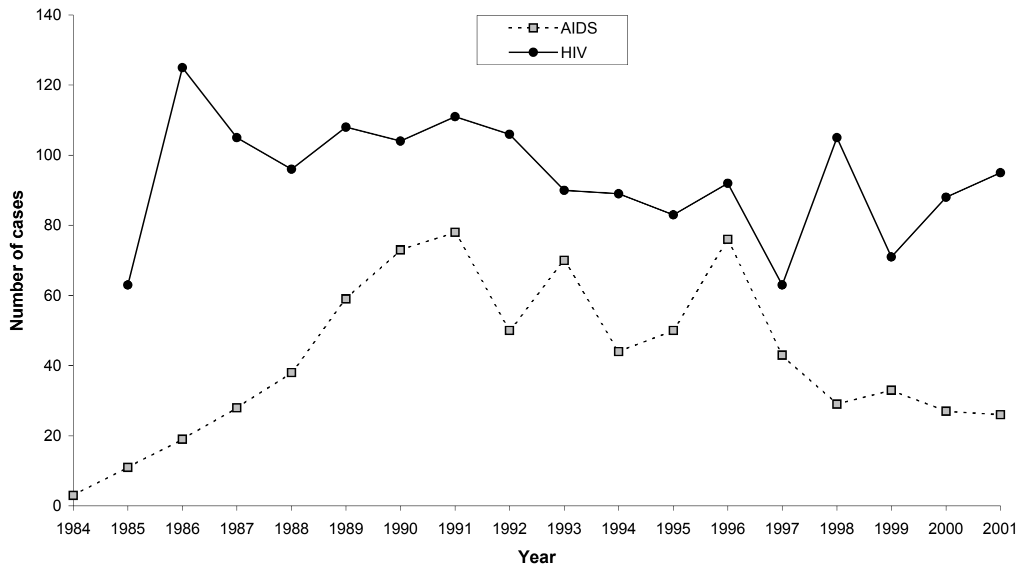
HIV/AIDS

In 2001, 26 cases of AIDS were notified to the AIDS Epidemiology Group. The annual incidence rate of AIDS in 2001 of 0.7 per 100 000 is the same as the 2000 rate. A total of 755 cases of AIDS have been notified in New Zealand since surveillance began in 1983. There were nine deaths from AIDS in 2001.

In 2001, there were 95 new cases of HIV infection notified, a slight increase on the 88 cases in 2000. A cumulative total of 1558 HIV infections have been diagnosed since 1985. These totals exclude the 184 people diagnosed with HIV through viral load testing.

The following graph shows the number of AIDS notifications and HIV laboratory-confirmed cases since 1984.

AIDS notifications and HIV laboratory-confirmed cases by year, 1984 - 2001



The following table shows the most likely risk behaviour categories of the people notified with AIDS and diagnosed with HIV in 2001. The predominant risk behaviour category remains homosexual contact, although this is relatively less important for new cases of HIV infection. In 2001, heterosexual contact was responsible for an increasing proportion of new AIDS notifications (54%) and new HIV infections (44%). Injecting drug use remains an uncommon risk behaviour category for both HIV and AIDS.

Risk behaviour category by date of notification of people with AIDS, and by date of diagnosis for those found to be HIV antibody positive

Risk behaviour category	Sex	AIDS				HIV Infection reported by Western Blot[1]				HIV Infection reported by Viral Load	
		12 months to 31.12 01		Total to 31.12.01		12 months to 31.12.01		12 months to 31.12.01		Total to 31.12.01	
		Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Homosexual contact	Male	8	30.8	587	77.7	38	40.0	816	52.4	123	66.8
Homosexual & IDU	Male	0	0.0	10	1.3	0	0.0	16	1.0	7	3.8
Heterosexual contact	Male	4	15.4	44	5.8	16	16.8	136	8.7	13	7.1
	Female	10	38.5	38	5.0	26	27.4	163	10.5	17	9.2
Injecting drug user (IDU)	Male	0	0.0	13	1.7	2	2.1	33	2.1	3	1.6
	Female	0	0.0	5	0.7	0	0.0	8	0.5	3	1.6
Blood product recipient	Male	0	0.0	16	2.1	0	0.0	29	1.9	5	2.7
Transfusion related	Male	1[2]	3.8	2[2]	0.3	2	2.1	8	0.5	1	0.5
	Female	0	0.0	1[2]	0.1	0	0.0	6	0.4	0	0.0
	Unknown	0	0.0	0	0.0	0	0.0	5	0.3	0	0.0
Perinatal	Male	2	7.7	3	0.4	2	2.1	8	0.5	1	0.5
	Female	0	0.0	3	0.4	1	1.1	7	0.4	0	0.0
Awaiting information/ Undetermined	Male	1	3.8	30	4.0	3	3.1	276	17.7	7	3.8
	Female	0	0.0	2	0.3	3	3.1	25	1.6	1	0.5
	Unknown	0	0.0	0	0.0	0	0.0	14	0.9	0	0.0
Other	Male	0	0.0	0	0.0	1	1.1	2	0.1	2	1.1
	Female	0	0.0	1	0.1	1	1.1	6	0.4	1	0.5
TOTAL		**26**	**100**	**755**	**100.0**	**95**	**100**	**1558**	**100**	**184**	**100**

[1] Includes people who have developed AIDS
[2] Occurred overseas

The viral load test[15]

Viral load tests determine the number of viral particles circulating in the blood of infected persons. These tests, available in New Zealand since 1996, have important prognostic value, as people with high viral loads are more likely to progress to AIDS than those with low viral loads. The tests are also widely used to determine when to start antiretroviral treatment and to evaluate the effectiveness of such treatment over time.

A total of 912 people had undergone viral load testing in New Zealand to the end of 2001. Of those, 619 were known to the AIDS Epidemiology Group, because of a previous positive HIV antibody test in New Zealand. Of the remainder, further information has been obtained from 184 people who were previously not included in the Groups's HIV database. Additional information is being sought on the other 109 individuals.

By adding the monitoring of viral load tests to the routine surveillance of HIV antibody testing, the Group is better able to characterise the total population that has ever lived in New Zealand with HIV infection.

The following tables show the place of infection for people notified with AIDS and diagnosed with HIV in 2001. Sixty-two per cent (16/26) of new AIDS cases occurred overseas and of the HIV infections newly identified in 2001, 52% (49/95) were reported to have occurred overseas.

Place of infection for AIDS cases in 2001

Mode of infection	Sex	New Zealand	Overseas	Unknown	Total
Homosexual	Male	4	4	0	8
Heterosexual	Male	0	4	0	4
	Female	4	6	0	10
Transfusion recipient	Male	0	1	0	1
Perinatal	Male	1	0	1	2
Unknown	Male	0	1	0	1
Total		**9**	**16**	**1**	**26**

Place of infection for HIV cases in 2001

Mode of infection	Sex	New Zealand	Overseas	Unknown	Total
Homosexual	Male	27	11	0	38
Heterosexual	Male	3	12	1	16
	Female	10	15	1	26
IDU	Male	0	2	0	2
Transfusion recipient	Male	0	2	0	2
Perinatal	Male	1	1	0	2
	Female	0	1	0	1
Other	Male	0	1	0	1
	Female	0	1	0	1
Unknown	Male	0	1	2	3
	Female	0	2	1	3
Total		**41**	**49**	**5**	**95**

Hydatid disease

Seven cases of hydatid disease were notified in 2001. The 2001 rate of 0.2 per 100 000 was similar to the 2000 rate of 0.1. Six of the seven cases were either laboratory-confirmed or confirmed via imaging evidence characteristic of cystic hydatid disease. Hospitalisation status was recorded for six cases, four of whom were hospitalised. Four cases were female, two were male, and one case was of unknown gender. The cases' ages ranged between 44 and 72.

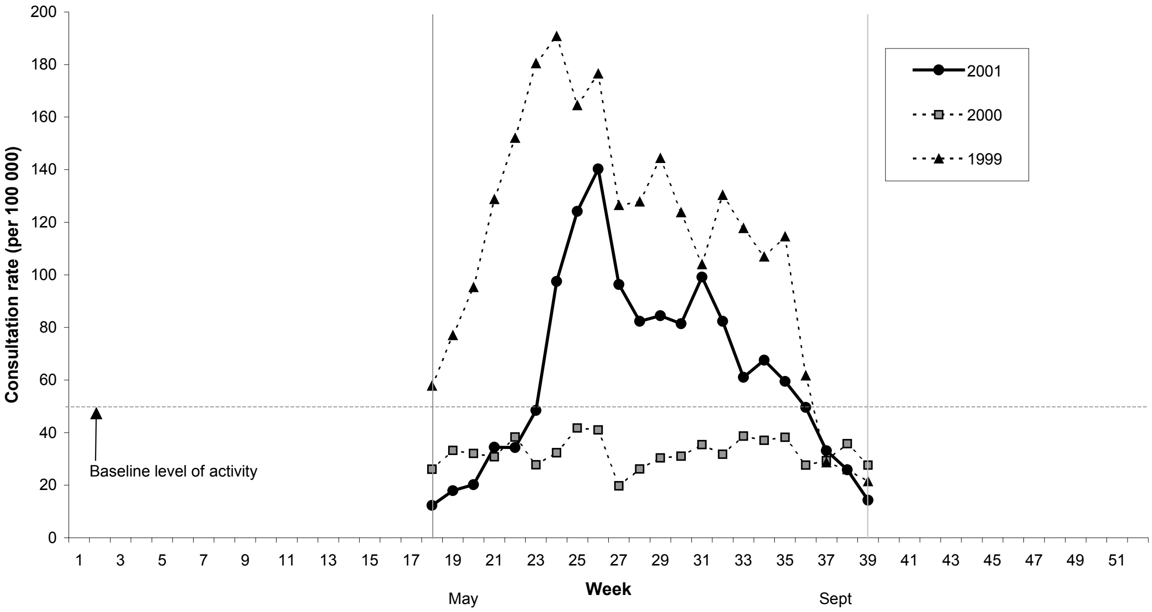
Two cases had lived on farms as children, where it is likely that the infection was acquired. A further case had a puppy that died from the disease 20 years ago. No information on risk factors was recorded for the remaining four cases.

Influenza

A full summary of influenza in New Zealand in 2001 has been published.[16] From May to September 2001, 4 079 consultations for influenza-like illness were reported from a national sentinel network of 77 general practices. This gives an average national weekly consultation rate of 62.8 per 100 000. This rate is higher than 2000 average weekly rate of 32.5.

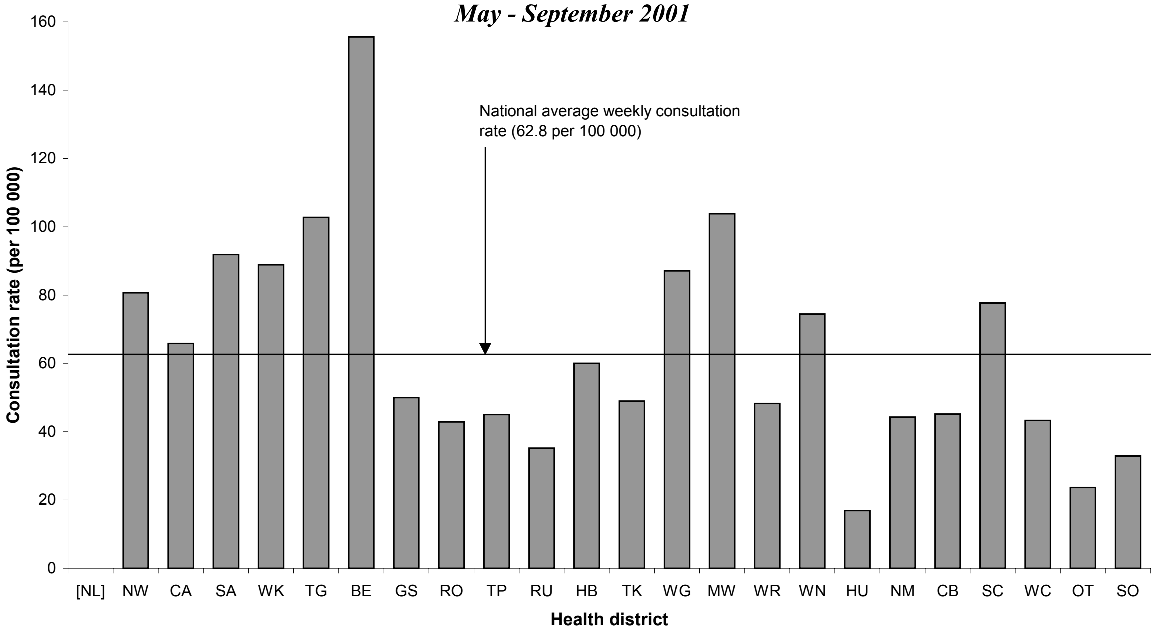
The following graph compares the weekly consultation rates for influenza-like illness in 2001 with 2000 and 1999. Influenza activity in 2001 was higher than in 2000 and lower than in 1999.

Weekly consultation rates for influenza-like illness in New Zealand, 1999, 2000 and 2001



The following bar chart shows the average weekly consultation rates for each health district for the influenza season. The health districts reporting the highest rate were Eastern Bay of Plenty (155.6 per 100 000 patient population), Manawatu (103.8), Tauranga (102.7), South Auckland (91.8), Waikato (88.9), and Wanganui (87.1).

Sentinel average weekly consultation rate for influenza-like illness by health district, May - September 2001

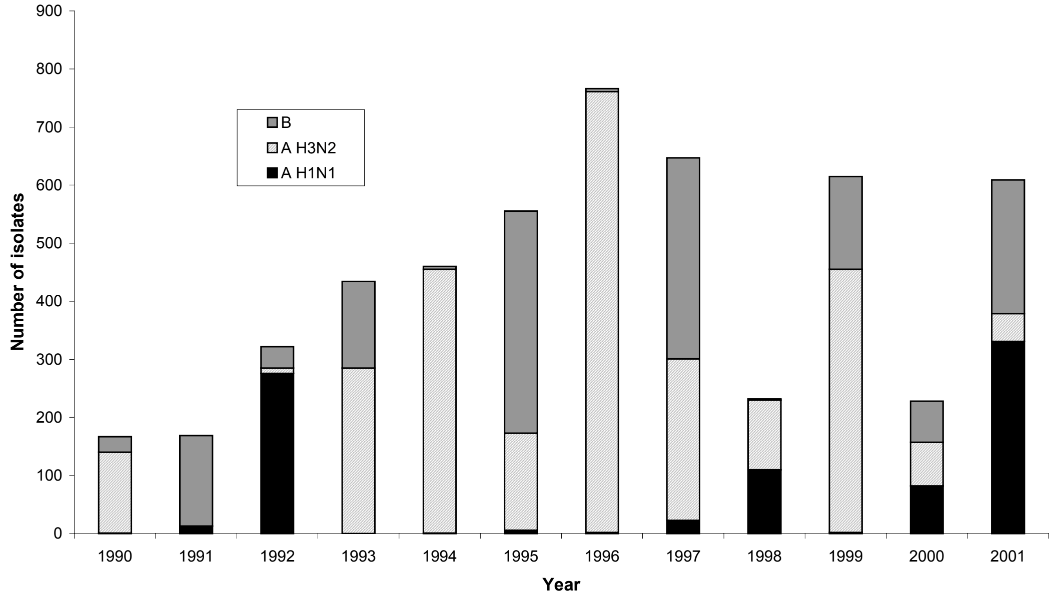


A total of 654 influenza isolates were identified in 2001, more than twice the 303 isolates in 2000 but less than the 816 isolates in 1999. Of the 2001 isolates, 313 came from sentinel practice surveillance during May to September. This is more than a four-fold increase from the 73 sentinel isolates identified in 2000, but lower than the 425 sentinel isolates identified in 1999. There were 341 non-sentinel isolates identified in 2001 compared to 230 in 2000 and 391 in 1999.

The majority of influenza isolates (424 or 65% of all isolates) were characterised as influenza A. There were 230 influenza B isolates identified in 2001, which represents 38% of typed and subtyped isolates (609) and 35% of all influenza isolates (654). Influenza B made up 24% of all isolates in 2000 and 20% in 1999.

The following graph shows the number and percentage of typed and subtyped (not total) influenza isolates from 1990 to 2001. There are three noticeable changes in terms of predominant patterns:

Influenza isolates by type,
1990 - 2001



Influenza A (H1N1)

During 1990 to 1999, influenza A (H1N1) predominated or co-dominated only in 1992 (86% of typed/subtyped isolates) and 1998 (47% of typed/subtyped isolates). However in the past two years (2001 – see above, and 2000), influenza A (H1N1) predominated consecutively, which is an unusual feature. There were 331 A (H1N1) isolates in 2001 (54% of typed/subtyped isolates).

Influenza A (H3N2)

Influenza A (H3N2) viruses have often been associated with more severe disease and with excess pneumonia and influenza mortality. For example, the highest peak of deaths at 94 in 1996 in New Zealand was recorded during an A (H3N2) epidemic. During 1993 to 2000, A (H3N2) had been the predominant or co-dominant strain for each year. However in 2001, A (H3N2) constituted only 8% of typed/subtyped isolates.

Influenza B

It is well documented that influenza B predominates or co-dominates every second year. In New Zealand, influenza B predominated or co-dominated in 1991, 1993, 1995, 1997, 1999 and 2001. When influenza B was not the predominant or co-dominant strain, it consisted of a small proportion during 1990 to 1999: 16% in 1990, 11% in 1992, 1% in 1994, 1% in 1996, 1% in 1998. However, in 2000, even though influenza B was not the predominant or co-dominant strain, it consisted of 38% of typed/subtyped isolates.

The Australian Influenza Vaccine Committee (AIVC) met in October 2001 to agree on the composition of the influenza vaccine for the 2002 winter season[17]. The recommended influenza vaccine formulation for New Zealand in 2002 was:

- A(H1N1) an A/New Caledonia/20/99-like strain
- A(H3N2) an A/Moscow/10/99-like strain
- B a B/Sichuan/379/99-like strain

This is the same composition as the 2001 formulation.

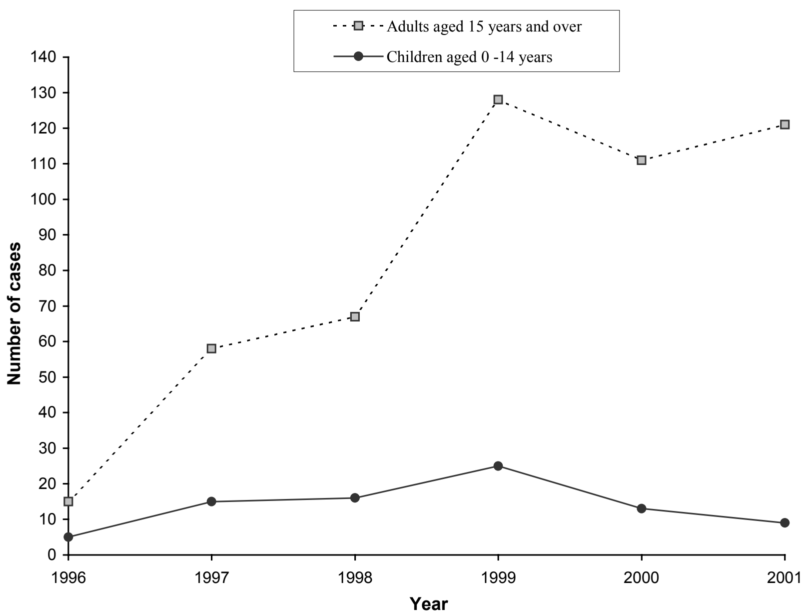
Lead absorption

A total of 130 cases of lead absorption was notified in 2001. Of these, nine cases were children aged 14 years or younger. In comparison, 124 cases were notified during 2000, thirteen of whom were children. Of the 101 cases in 2001 for whom hospitalisation status was recorded, six (5.9%) were hospitalised. Eight cases were linked to three reported outbreaks of lead absorption during 2001.

Rates higher than the national average of 3.5 per 100 000 were reported from Ruapehu (35.0), South Canterbury (12.8), Otago (9.6), Wanganui (6.9), Nelson-Marlborough (6.5), Manawatu (6.1), Taranaki (5.8), Waikato (5.5), and Southland (3.7) health districts.

Lead absorption became a notifiable disease in June 1996. The following graph illustrates the number of lead absorption notifications in both children and adults, each year since 1996. During 2001, adult notifications represented a greater proportion of total notifications than ever before.

Notified cases of lead absorption in children and adults 1996 - 2001



The following table shows the distribution of cases of lead absorption by age and ethnicity in 2001. There were 9 cases (6.9%) in children aged 0-14 years, and 121 (93.1%) adult cases. As in 2000, the highest rates occurred in adults aged 30-69 years. Gender was recorded for 125 of the 130 notified cases. Of these, 96 cases (76.8%) were male and 29 (23.2%) were female.

Lead absorption notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
1-4	4	3.3	0	0.0	0	0.0	0	0.0	2	6	2.8
5-9	1	0.6	0	0.0	0	0.0	0	0.0	1	2	0.7
10-14	1	0.6	0	0.0	0	0.0	0	0.0	0	1	0.3
15-19	7	4.4	1	2.0	0	0.0	0	0.0	1	9	3.4
20-29	8	2.6	0	0.0	0	0.0	0	0.0	5	13	2.7
30-39	22	5.5	1	1.3	0	0.0	0	0.0	7	30	5.2
40-49	23	5.8	0	0.0	0	0.0	0	0.0	6	29	5.4
50-59	19	5.7	0	0.0	0	0.0	0	0.0	4	23	5.5
60-69	11	4.7	0	0.0	1	13.4	0	0.0	2	14	5.0
70+	2	0.7	0	0.0	0	0.0	0	0.0	1	3	0.9
Unknown	0	-	0	-	0	-	0	-	0	0	-
Total	**98**	3.8	**2**	0.4	**1**	0.5	**0**	0.0	**29**	**130**	3.5

[1] Crude rate per 100 000, based on 2001 Census

Of the 121 adult notifications, 38 cases (31.4%) were exposed to lead through their work[1]: 16 carpenters, painters or sanders; seven engineers; five radiator repairers; three metal workers; two boat builders; two leadlighters; one welder, a fire assay analyst, and an engraver. Six of these 38 cases were also recreational shooters. Of the remaining 83 cases, for which no occupational exposure to lead was indicated, 24 (19.8% of all adult notifications) were recreational shooters[2], 25 (20.7%) were 'most probably' exposed to lead paint flakes or dust in their home[3], one case was a leadlighter hobbyist and, one case melted lead in his home for diving bells. No risk factor information was recorded for the remaining 32 (26.4%) adult cases.

Of the nine notified cases in children, seven lived in pre-70s built homes in which old paint had recently been stripped. A further two cases were potentially exposed to lead through recent home renovations, and one case through a parent's shooting hobby. No risk factor information was recorded for the remaining case. Blood lead concentrations were recorded for eight of the nine children and ranged from 0.78 to 1.77 μmol/l with a median of 0.97 μmol/l.

1 As the notification of occupational lead absorption is now being actively encouraged by the Ministry through EpiSurv, the total number of cases of lead absorption from occupational settings is expected to increase from this year.
2 Several recreational shooters were recorded as engaging in the melting, welding or soldering of lead in the home.
3 Several occupationally exposed cases were also recorded as living in pre-70's buildings in which the paint was chalking, flaking or had been recently stripped.

Legionellosis

A total of 46 cases of legionellosis was notified in 2001. In comparison there were 56 laboratory-reported cases during 2001, based on date on which the sample was received at ESR. Of the laboratory-reported cases, 48 were confirmed and a further 8 were regarded as probable.

Of the laboratory-reported cases, 48 were confirmed either by:

- Culture isolation of legionella organisms (6 cases)
- Demonstration of an antibody seroconversion (17 cases)
- Demonstration of an antibody seroconversion and culture isolation of legionella organisms (1 case),
- Positive urinary antigen test (1 case)
- Culture isolation and PCR positive from blood (1 case).
- Demonstration of 2 of more antibody titres at or above 512 (15 cases)
- Demonstration of rising antibody titres to above 512 (7 cases)

A further 8 cases were regarded as probable, based on a single high titre (≥512) in a single serum sample.

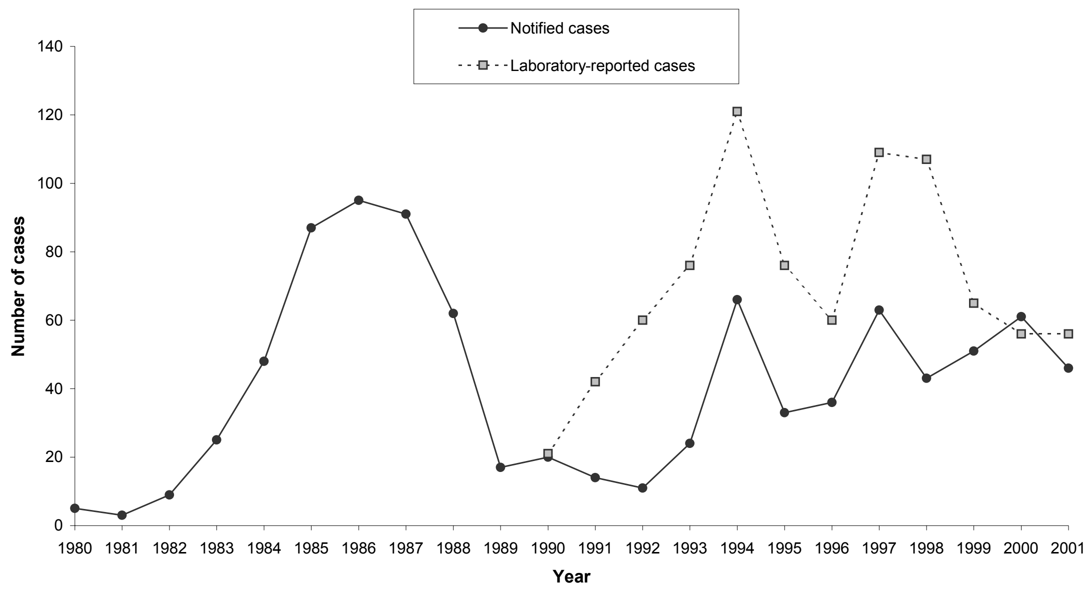
The 2001 rate of 1.2 per 100 000 is slightly lower than the 2000 rate of 1.6. Of the 42 cases for whom hospitalisation status was recorded, 31 (73.8%) were hospitalised.

There were two deaths caused by legionellosis in 2001. Both deaths following infection with *Legionella longbeachae* serogroup 1 from commercially prepared composted material.

Most cases were sporadic. The exceptions were two outbreaks, each involving 2 persons. The first outbreak, from Central Auckland health district involved the exposure of two personnel to *L. dumoffii* from the same contaminated cooling tower at their place of work. The second outbreak, from Northland health district, involved 2 people exposed to *L. longbeachae* serogroup 1 from the same commercially prepared composted material.

The following graph shows laboratory-reported cases of legionellosis by year since 1990 and notified cases since 1980.

Legionellosis notifications and laboratory-reported cases by year, 1980 - 2001



The rate of legionellosis varied throughout the country. Rates higher than the national average were recorded in Waikato (4.2 per 100 000), Taupo (3.2), Wairarapa (2.6), Tauranga (2.3), Northland (2.1), Wanganui (1.7), Hutt (1.5), Canterbury (1.5) and South Canterbury (1.3) health districts.

The following table shows the distribution cases of legionellosis by age group and ethnicity. Gender was recorded for 45 (97.8%) of the 46 cases. Twenty-eight cases (62.2%) were male and 17 (37.8%) were female.

Legionellosis notifications by age group and ethnicity, 2001

Age group	European		Maori		Pacific people		Other		Unknown	Total	
(years)	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
1-4	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
5-9	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
10-14	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
15-19	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
20-29	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
30-39	1	0.3	0	0.0	0	0.0	0	0.0	0	1	0.2
40-49	5	1.3	1	1.7	0	0.0	0	0.0	0	6	1.1
50-59	14	4.2	0	0.0	0	0.0	0	0.0	1	15	3.6
60-69	10	4.3	0	0.0	0	0.0	1	9.1	2	13	4.6
70+	8	2.8	0	0.0	0	0.0	0	0.0	3	11	3.4
Unknown	0	-	0	-	0	-	0	-	0	0	-
Total	**38**	**1.5**	**1**	**0.2**	**0**	**0.0**	**1**	**0.4**	**6**	**46**	**1.2**

1 Crude rate per 100 000, based on 2001 census

The following table shows a summary of risk factor information for legionellosis in 2001. Some cases had more than one risk factor recorded.

Risk factors associated with legionellosis, 2001

Risk Factor	Yes	No	Unk	Proportion[1]
Contact with definite or suspected environmental source of infection	28[2, 3]	2	16	93.3%
Overseas travel during incubation period	0	30	16	0.0%
Smoking	10	28	8	26.3%
Pre-existing immunosuppressive or debilitating condition	11	22	13	33.3%

1 "Proportion" refers to the percentage of cases who answered "yes" out of the total number of cases where this information was known
2 Twenty-eight cases had contact with a suspect environmental source of infection
3 The most commonly recorded environmental source was potting mix/compost/mulch

Of the laboratory-reported cases 48 were confirmed and 8 were regarded as probable
In 2001, 36 (75%) of the confirmed cases were notified and 7 (87.5%) of the probable cases were notified. This compares with a notification rate of 80% for confirmed cases and 67% for probable cases in 2000. The confirmed cases peaked in early spring (September-December) as in previous years with very few confirmed cases in winter. The seasonality of legionellosis may be associated with the fact that the prevalent strain causing disease is *L. longbeachae* serogroup 1, and this strain is commonly associated with compost and soils. Anecdotal evidence suggests that there is greater use of these products during the spring and summer months.

The following table compares the species/serogroup distribution of laboratory-reported *Legionella* over the last six years. Of note is the increasing proportion of cases caused by *L. longbeachae* (9.2% in 1997, 12.4% in 1998, 52.3% in 1999, 50.0% in 2000 and 55.4% in 2001).

Laboratory-reported legionellae by species/serogroup, 1995-2001

Legionella species/serogroup		Year						
		1995[1]	**1996[1]**	**1997[1]**	**1998[1]**	**1999[1]**	**2000[1]**	**2001**
L. pneumophila	serogroup 1	0	3	3	8	4	5	2
	serogroup 2	1	0	3	3	0	0	1
	serogroup 3	0	1	2	0	0	0	0
	serogroup 4	3	1	5	0	0	1	0
	serogroup 5	0	0	13	5	2	3	0
	serogroup 6	1	0	5	3	0	0	0
	serogroup 7	0	0	1	2	0	0	0
	serogroup 8	1	0	2	1	0	0	0
	serogroup 10	2	0	2	0	0	0	0
	serogroup 11	0	0	0	7	0	0	1
	serogroup 12	2	5	8	11	4	0	1
	serogroup 13	2	1	0	1	1	0	2
	serogroup 14	0	1	0	0	0	0	0
	serogroup 15	0	0	1	2	0	0	0
	serogroup unidentified	0	0	0	24	2	6	2
	Total	12	12	45	67	13	15	9
L. anisa		1	0	2	1	0	1	0
L. bozemanii	serogroup 1	0			2	1	1	0
	serogroup ½	0	0	1	0	0	0	0
	serogroup 2	1			0	1	3	0
L. dumoffii		1	0	1	2	2	0	6
L. longbeachae	serogroup 1	5	0		3	11	22	26
	serogroup 2	1	0	10	2	1	2	0
	serogroup unidentified	0	0		8	22	4	5
L. micdadei		6	2	13	3	6	2	2
L. jordanis		3	3	3	2	2	0	0
L. feelei		1	3	1	0	0	0	0
L. gormanii		0	4	0	0	2	2	3
Non- L. *pneumophila* strains		0	0	0	0	0	0	3
Unidentifiable *Legionella* sp.		28	21	33	15	4	4	2
Total		**59**	**45**	**109**	**105**	**65**	**56**	**56**

1 Data source: Lablink Annual Summaries 1995-2001

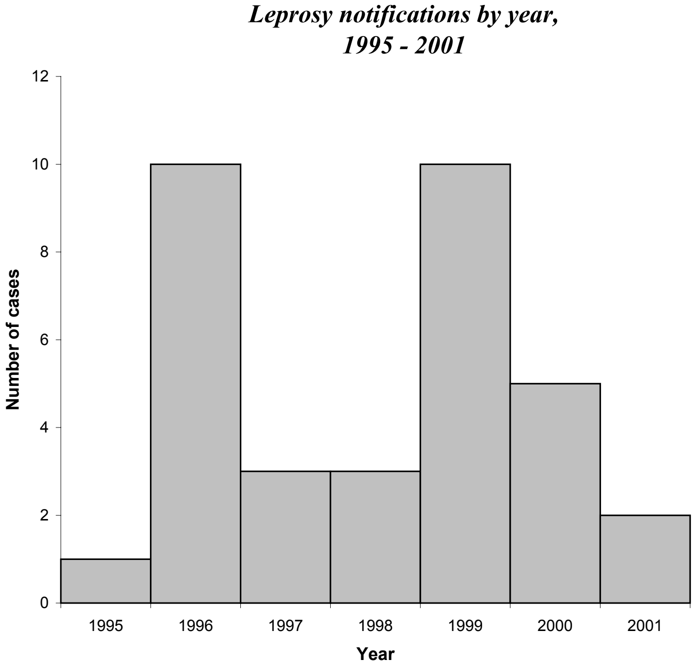
Because laboratory reporting procedures changed midway through 1998, data from earlier years are not necessarily comparable with those of later years.

Leprosy

Two cases of leprosy were notified in 2001. Both cases were laboratory confirmed. In comparison, five cases were notified in 2000, two of whom were recorded on EpiSurv as being confirmed. Both cases in 2001 were Pacific people: a 31 year-old male from Central Auckland Health District, and a female aged 30 years from South Auckland Health District. Further risk factor information was not available.

The majority (79.4% or 27/34) of the cases notified between 1995 and 2001 were from the combined Auckland health districts. Twenty-two (64.7%) were Pacific people and 12 (35.3%) were of 'Other' ethnicity.

The following graph shows the number of leprosy notifications each year since 1995.



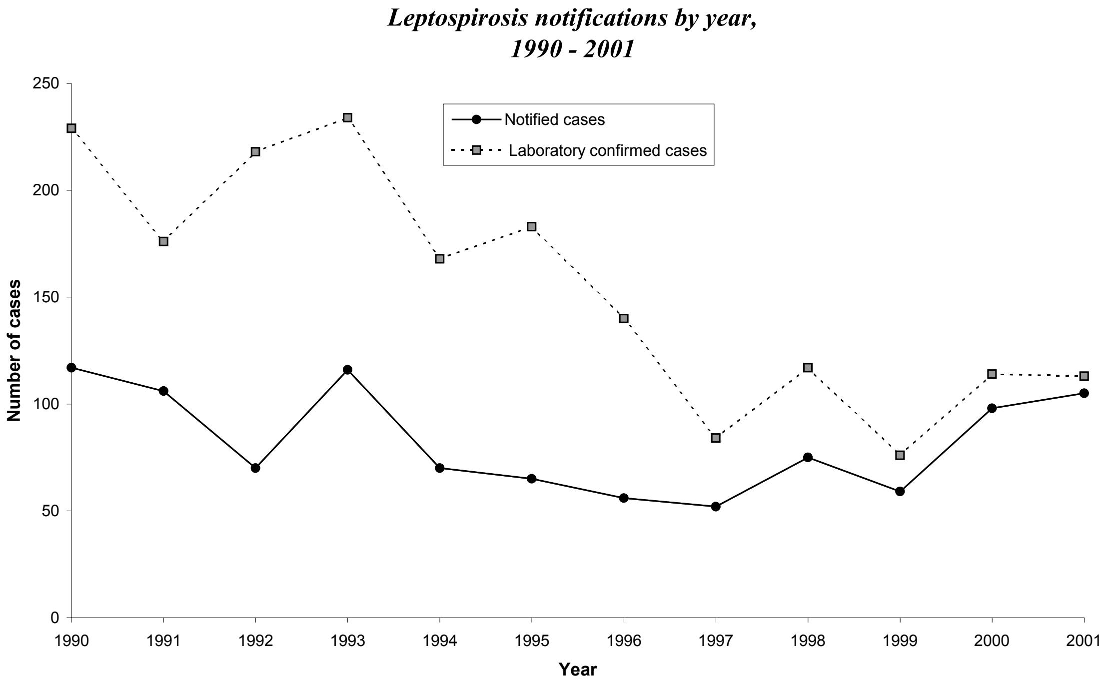
Leptospirosis

A total of 105 cases of leptospirosis was notified in 2001. Of these, 76 were recorded on EpiSurv as being confirmed cases. In comparison, 113 cases were laboratory-reported in 2001[1]. Matching of laboratory-reported and notified cases indicated that 82 cases were both notified and laboratory-reported during 2001; suggesting that 23 cases were notified but not lab-reported, and conversely, 31 cases were lab-reported but not notified[2].

The 2001 notification rate of 2.8 per 100 000 was similar to the 2000 rate of 2.6. Of the 82 cases in 2001 for whom hospitalisation status was recorded, 45 (54.9%) were hospitalised.

[1] *Laboratory data is based on the date the specimen was received at ESR or other laboratory.*
[2] *Note that due to inevitable time lags between notification and specimen testing, a 100% match between notified and lab-reported cases in any set time period, is never expected.*

The following graph shows the number of notified and laboratory-reported cases of leptospirosis each year since 1990.



The rate of leptospirosis varied throughout the country. Rates higher than the national average were recorded in Gisborne (18.2 per 100 000), Northland (10.7), Hawkes Bay (9.8), South Canterbury (7.7), Waikato (7.1), Ruapehu (7.0), Tauranga (4.6), Manawatu (4.1), West Coast (3.3), Taupo (3.2), Rotorua (3.1), and Taranaki (2.9) health districts.

The following table shows the distribution of cases of leptospirosis by age group and ethnicity. Gender was recorded for 101 (96.2%) of the 105 cases. Of these, 87 cases (86.1%) were male and 14 (13.9%) were female.

Leptospirosis notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
1-4	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
5-9	1	0.6	0	0.0	0	0.0	0	0.0	0	1	0.3
10-14	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
15-19	1	0.6	0	0.0	0	0.0	0	0.0	1	2	0.8
20-29	10	3.3	2	2.4	2	5.9	1	2.3	5	20	4.1
30-39	16	4.0	4	5.2	1	3.2	1	2.2	9	31	5.4
40-49	17	4.3	1	1.7	0	0.0	0	0.0	4	22	4.1
50-59	13	3.9	1	3.0	0	0.0	0	0.0	9	23	5.5
60-69	6	2.6	0	0.0	0	0.0	0	0.0	0	6	2.1
70+	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
Unknown	0	-	0	-	0	-	0	-	0	0	-
Total	**64**	2.4	**8**	1.5	**3**	1.5	**2**	0.8	**28**	**105**	2.8

1 Crude rate per 100 000, based on 2001 Census

Occupation was recorded for 95 of the 105 notified cases. Of these, 84 cases (88.4%) were recorded as engaged in occupations previously identified to present high risk for exposure to *Leptospira spp.* in New Zealand[18]. The proportion of 2001 leptospirosis cases in high risk occupations has not changed from that of 2000 cases (88.1%).

Of the 95 cases with recorded occupation, 48 (50.0%) were farmers (dairy, pig, deer) or farm workers, and 31 (32.6%) worked in the meat processing industry (as either freezing workers, butchers, or meat inspectors). Leptospirosis cases also included one stock agent, a trapper, a fisherman, a forestry worker, and a horticultural worker. Three of the remaining 11 cases (who indicated no occupational exposure to leptospirosis) were recorded to have had other exposure to farm or wild animals in the twenty days preceding onset of illness.

The following table compares the number of different species of laboratory-reported *Leptospira* over the last seven years. Note that because some of the results included in this table have been obtained via serological techniques, rather than by isolation, they must be interpreted with caution, due to the potential for cross-reacting among antibodies.

Species/serovar distribution of laboratory-reported leptospira, 1995-2001

Leptospira species / Serovar	**Year[1]**						
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
L. interrogans sv *australis*	0	0	0	2	1	2	1
L. borgpetersenii sv *ballum*	25	28	12	27	17	22	15
L. interrogans sv *bratislava*	17	13	0	5	0	0	0
L. interrogans sv *canicola*	1	0	1	0	0	1	1
L. interrogans sv *copenhageni*	6	3	4	8	7	2	1
L. interrogans sv *pomona*	29	21	22	20	11	27	46
L. borgpetersenii sv *tarassovi*	10	4	7	12	9	8	11
L. borgpetersenii sv *hardjo*[3]	87	57	32	32	21	50	35
Unidentified *Leptospira* species	17	10	6	11	10	2	4
Total[2]	**183**	**136**	**84**	**117**	**76**	**114**	**113**

1 Data source: Lablink Annual Summaries 1995-2000
2 More than one serovar is recorded for some cases
3 Previously denoted *as L. interrogans* serovar *hardjo*

The *Leptospira* species and serovar was recorded on EpiSurv for 55 of the 105 notified cases: *L. borgpetersenii* sv *hardjo* (22 cases), *L. interrogans* sv *pomona* (17), *L. borgpetersenii* sv *tarassovi* (8), *L. borgpetersenii* sv *ballum* (7), and *L. interrogans* sv *copenhageni* (1).

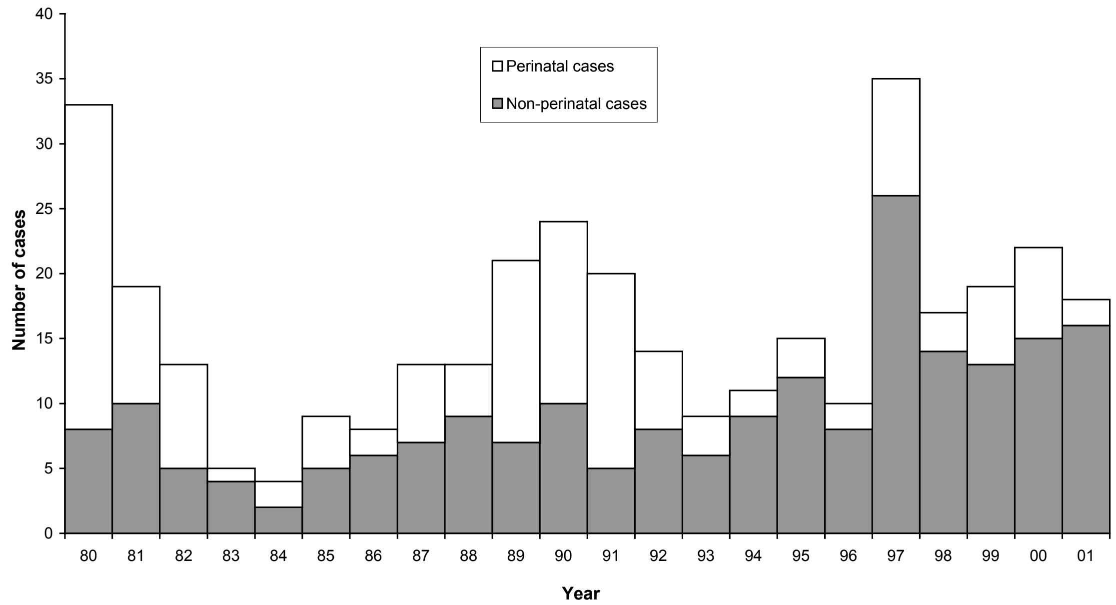
Listeriosis

A total of 18 listeriosis cases was notified in 2001, two were perinatal cases and 16 non-perinatal. The 2001 rate of 0.5 per 100 000 was similar to the 2000 rate of 0.6. Fifteen of the non-perinatal cases and both perinatal cases were hospitalised. Two deaths were also reported: one perinatal case and one non-perinatal case. No outbreaks of listeriosis were reported in 2001.

Seven cases were reported from the combined Auckland health districts; two each from Tauranga, Canterbury, and Otago; and one each from Northland, Gisborne, Taranaki, Wellington, and South Canterbury health districts.

The following graph shows listeriosis notifications each year since 1980.

Listeriosis notifications by year, 1980-2001



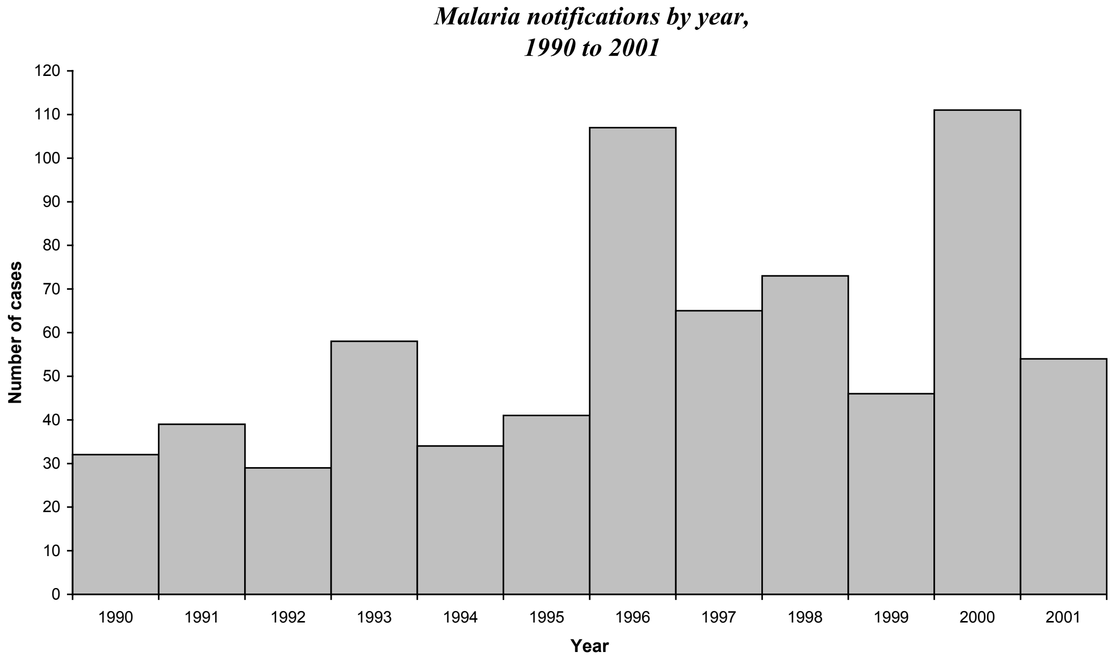
Thirteen of the 16 non-perinatal cases either had an underlying illness or were elderly.

During 2001, the ESR Enteric Reference Laboratory received 18 listeriosis isolates, all of which could be matched to a notified case on EpiSurv. Nine cases were identified as serotype 04 and nine were serotype 1/2.

Malaria

A total of 54 cases of malaria was notified in 2001. The 2001 rate of 1.4 per 100 000 was significantly (Chi-square, $p<0.001$) lower than the 2000 rate of 3.0. Of the 53 cases for which hospitalisation status was recorded, 26 cases (49.5%) were hospitalised. Eight cases were recorded as having been linked to the malaria outbreak which occurred among armed forces personnel travelling to East Timor in recent years. Since 1998, a total of 67 confirmed cases have been attributed to this outbreak source.

The following graph shows the number of cases of malaria notified each year since 1995.



Gender information was recorded for all 54 cases. Of these, 43 cases (79.6%) were male and 11 (20.4%) were female. Over half (29) of all cases were 20 to 39 year old males.

Overseas travel information was recorded for 53 cases[1], of which 45 cases (84.9%) had been overseas during the incubation period. An additional seven indicated prior overseas travel which would account for the infection. An overseas destination was implicated for 51 cases: East Timor (14), Indonesia (11), Solomon Islands (7), Papua New Guinea (6), Africa (7), India (3) and Honduras, Vanuatu, Singapore (1 each). All fourteen cases who had recently travelled to East Timor had been part of New Zealand's military/peacekeeping involvement in the region.

The reason for travel was recorded for 40 cases. Nineteen cases were New Zealanders travelling overseas; seven were visitors to New Zealand from the Solomon Islands (3 cases), Indonesia (2), Papua New Guinea and Africa (1 each); two were migrants from Indonesia and the Solomon Islands; one was a refugee from Indonesia and the remaining 11 cases had 'Other' reasons for travel.

The malarial species was identified in 50 cases: *P. vivax* was identified in 40 cases and *P. falciparum* in 11. (Both species were identified in one case).

The following table shows the countries/regions where the infection was most likely acquired, for each of the two species identified.

[1] *The single case for which no information on overseas travel was recorded was a 30 year-old male from Papua New Guinea.*

Malarial species and countries/regions where infection probably acquired:

Country	Malarial species		
	Total	***P. vivax***	***P. falciparum***
Sub-Saharan Africa[1]	6	1	5
Oceania			
Papua New Guinea	6	6	0
Solomon Islands[1]	6	4	2
Vanuatu	1	0	1
South East Asia			
East Timor	14	13	1
Indonesia[1]	10[2]	9	2
Singapore	1	1	0
Southern and Central America			
Honduras	1	1	0
Southern and Central Asia			
India[1]	2	2	0
Unknown	3	3	0
Total	**50[3]**	**40[2]**	**11[2]**

1 Species unidentified for one case
2 One case had both *P. Falcip and P. vivax* identified
3 Malarial species was not identified in four cases

Measles

A total of 83 cases of measles was notified in 2001 and a total of 25 cases was laboratory-reported[1] in 2001. Matching of notified and laboratory-reported cases indicated that 13 cases were both notified and laboratory-reported. In comparison, during 2000, 64 cases of measles were notified and 9 cases were lab-reported.

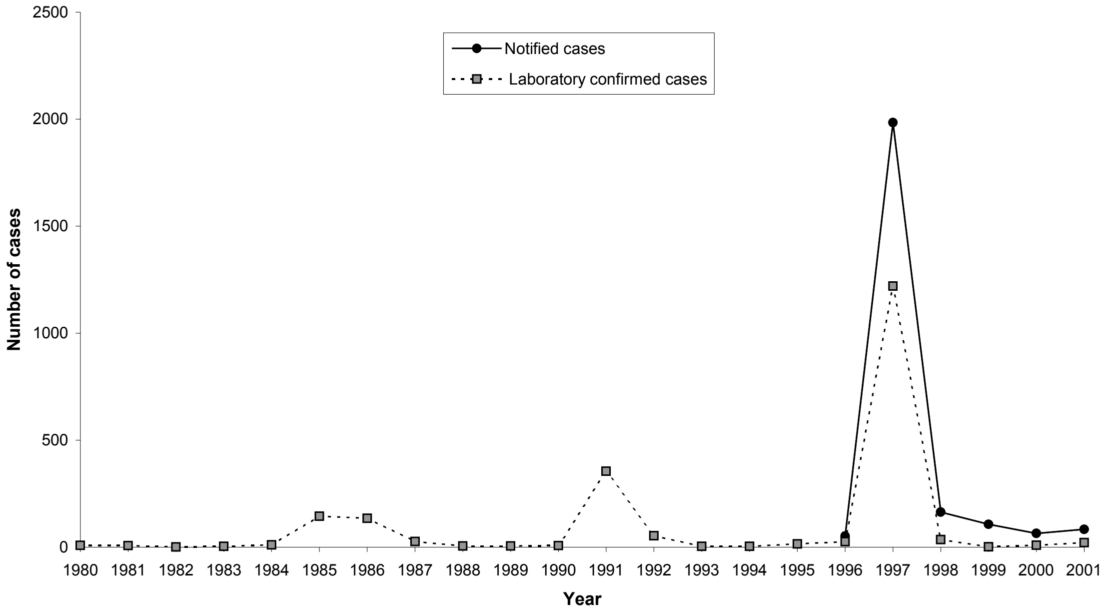
The rates of measles varied throughout the country in 2001. Rates higher than the national average were recorded in West Coast (13.2 per 100 000), Southland (7.4), Gisborne (6.8), Tauranga (5.4), Hawkes Bay (4.9), Nelson-Marlborough (4.1), Canterbury (3.5), and Otago (3.0) health districts.

Of the 83 cases notified during 2001, 66 (79.5%) had hospitalisation information recorded, and of these, 10.6% (7/66) were hospitalised. Six cases of measles were linked to outbreaks of the disease during 2001: four cases were part of an outbreak in the Auckland region and two cases were linked to a Wellington outbreak.

Measles became a notifiable disease in June 1996. The last epidemic began in March 1997. The following graph shows the total number of laboratory-reported and notified cases of measles each year since 1996.

[1] *The number of laboratory-reported cases in 2001 is based on the date specimen was received by testing laboratory.*

Measles notifications and laboratory-reported cases by year, 1980 - 2001



The following table shows the distribution of cases of measles by age group and ethnicity. Of the 82 cases for which gender was recorded 45 (54.9%) were male and 37 (45.1%) were female.

Measles notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	11	37.0	3	21.4	1	19.4	1	26.9	4	20	36.6
1-4	23	18.9	4	7.5	0	0.0	1	7.1	4	32	14.8
5-9	6	3.6	0	0.0	0	0.0	0	0.0	2	8	2.8
10-14	1	0.6	0	0.0	0	0.0	0	0.0	1	2	0.7
15-19	2	1.2	0	0.0	0	0.0	1	3.6	0	3	1.1
20-29	11	3.6	0	0.0	0	0.0	2	4.6	2	15	3.1
30-39	1	0.3	0	0.0	0	0.0	0	0.0	1	2	0.3
40-49	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
50-59	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
60-69	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
70+	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
Unknown	1	-	0	-	0	-	0	-	0	1	-
Total	**56**	2.1	**7**	1.3	**1**	0.5	**5**	2.0	**14**	**83**	2.2

[1] Crude rate per 100 000, based on 2001 Census

No measles cases notified in 2001 reported overseas travel during the incubation period for the disease. Ten cases (29.4% of the 34 for which this information was recorded) reported contact with another case in the previous three weeks; and 25 cases (51.0% of the 49 cases for which the information was recorded) attended school, pre-school or childcare.
The recommended immunisation schedule for measles in 2001 was two doses of MMR vaccine, the first given at 15 months and the second at 11 years of age. There was also a catch-up campaign to encourage the vaccination of children prior to school entry. Immunisation status was known for 69.9% (58/83) of cases notified during 2001. Of these,

31.0% (18/58) were immunised. The following table shows the number of doses of MMR vaccine given to measles cases in each relevant age group.

Age group of measles notifications and vaccination received, 2001

Age group	Total cases	Immunisation Status					
		1 dose	2 doses	3 doses	Immunised[1] (no dose info)	Not immunised	Immunisation status unknown
< 15 mths	33	1	0	0	0	24	8
15 mths - 4yrs	20	8	0	0	1	7	4
5 - 10 yrs	9	1	1	0	1	3	3
11+ yrs	21	2	0	0	3	6	10
Total	**83**	**12**	**1**	**0**	**5**	**40**	**25**

1 Case was immunised but the number of doses was not recorded

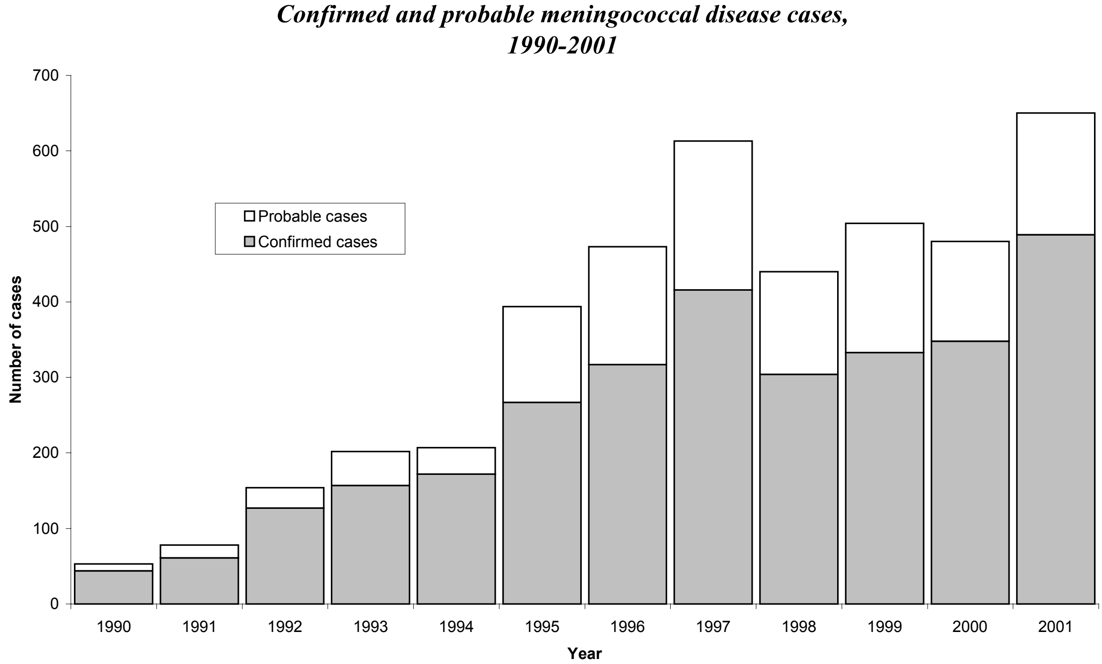
Meningococcal disease

A full description of the epidemiology of meningococcal disease in 2001 is contained in a separate report.[19]

A total of 650 cases of meningococcal disease was reported in 2001, giving a rate of 17.4 per 100 000 population. This rate is the highest since the start of the current epidemic in 1991, surpassing the previously highest rate of 16.9 per 100 000 in 1997. Of the 650 cases for 2001, 489 (75.2%) were laboratory confirmed. These figures are based on the combined laboratory and notification database which uses earliest date for the case (onset or hospitalisation data rather than report date, if available).

Hospitalisation status was recorded for 632 cases (97.2%), and of these 97.9% (619/632) were hospitalised. Twenty-six deaths were reported during 2001. This brings the total since 1991 to 185. The case fatality rate for 2001 was 4.0% (1991-2001 average 4.4%).

The following graph shows the number of confirmed and probable cases since 1990.



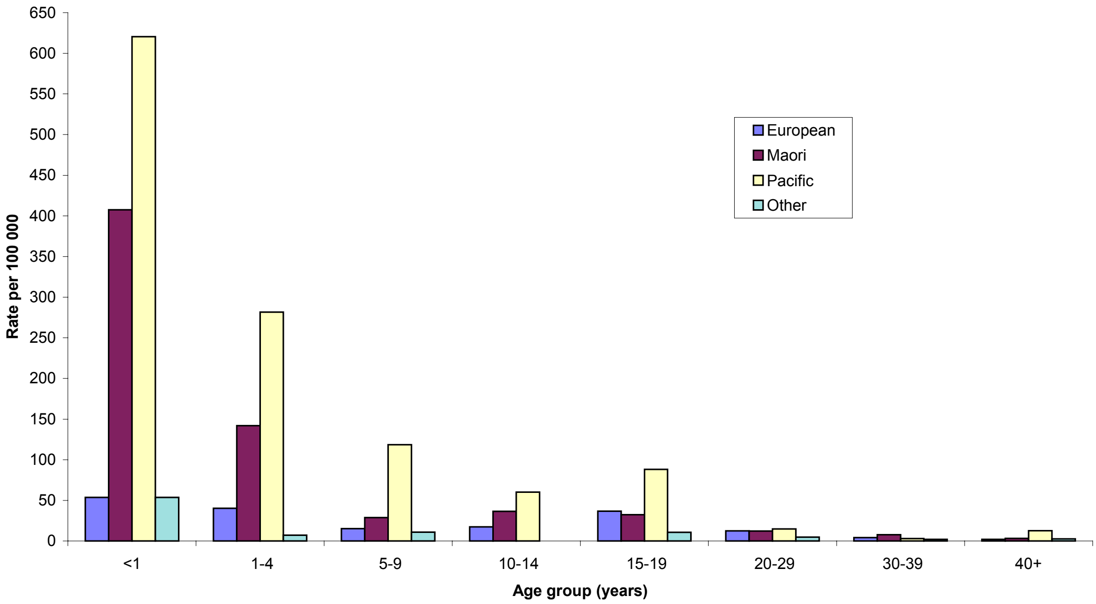
The marked seasonality in incidence continued in 2001, with 63.2% of cases occurring in winter and spring (June – November).

The rate of meningococcal disease varied throughout the country in 2001. Rates higher than the national average were recorded in Taupo (41.3 per 100 000), Rotorua (40.3), South Auckland (33.0), Eastern Bay of Plenty (32.6), Otago (32.5), Wairarapa (28.7), Northland (26.4), Gisborne (25.0), Waikato (23.3), Central Auckland (22.0), and Hawkes Bay (20.2) Health Districts. South Canterbury Health District reported the lowest rate (3.8 per 100 000).

The age distribution followed that of previous epidemic years with the highest rates occurring among <1 and 1-4 year age groups. Age standardised rates were highest among Pacific people, followed by Maori.

The following graph shows the distribution of meningococcal disease cases by age group and ethnicity for 2001.

Meningococcal disease rates by age group and ethnicity, 2001



Data on pre-hospital management were recorded for 589 cases, including 24 of the 26 fatal cases. These data show that 22.9% (135/589) of cases received antibiotic treatment prior to hospital admission. In 2001, there were three fatalities among cases seen by a doctor prior to hospital admission and given antibiotics, giving a case-fatality rate among this group of 2.2%. By comparison the case-fatality rate of 7.5% among those cases not seen by a doctor prior to admission and not given pre-hospital antibiotics.

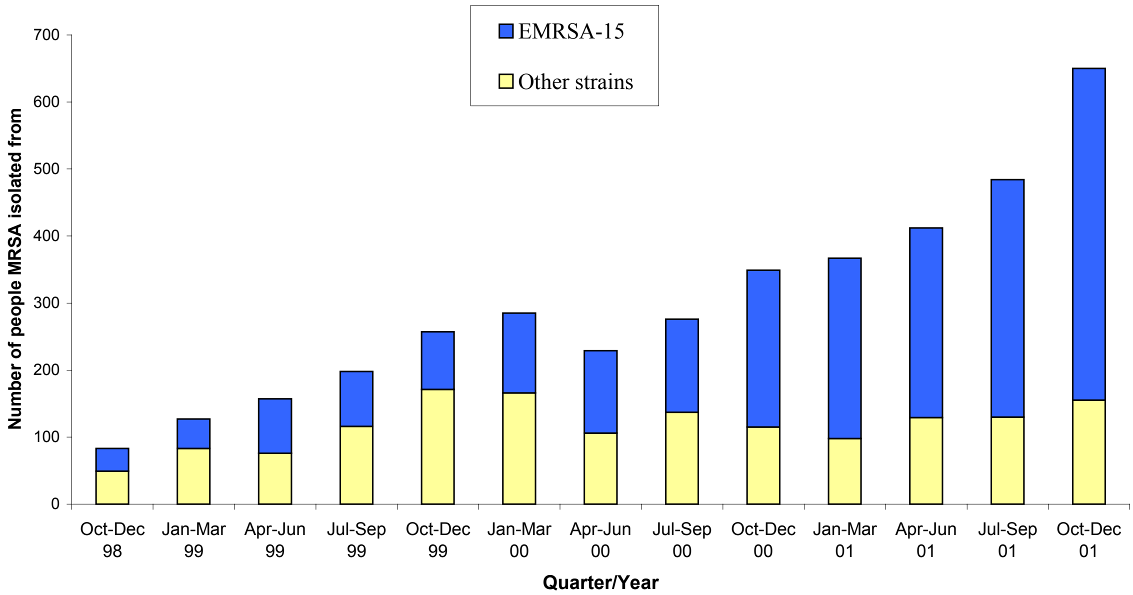
Serogroup B disease continued to predominate during 2001 although an increase in serogroup C disease to 9.4% of the cases proportionately lowered serogroup B involvement to 88.4%. Meningococci with the PorA subtype P1.7b, 4 continued to cause most disease. Of the 462 cases for whom the PorA subtype could be determined using serosubtyping of isolates (n=319) or sequence typing of amplified DNA (n=143), 372 (80.5%) were caused by meningococci with the P1.7b, 4 PorA subtype. This PorA subtype is the target antigen in the vaccine that will be used in trials in New Zealand aimed at limiting the epidemic.

The antimicrobial susceptibility of the 318 viable isolates received at ESR from cases of invasive disease in 2001 was tested. All isolates were susceptible to penicillin, ceftriaxone, rifampicin and ciprofloxacin. However, 7.5% (24/318) had reduced penicillin susceptibility, with MICs of 0.12-0.25 mg/L.

Multiresistant methicillin-resistant *Staphylococcus aureus*

The incidence of multiresistant methicillin-resistant *Staphylococcus aureus* (mMRSA) increased 65.2% in 2001: from an annual rate of 27.7 per 100 000 in 2000 to 45.8 per 100 000. mMRSA are defined as *S. aureus* resistant to two or more classes of antibiotics in addition to ß-lactams. mMRSA from 1710 people (1594 patients and 116 healthcare workers) were referred to ESR in 2001.
Information on whether mMRSA was causing infection or colonising was reported for 1237 of the people mMRSA was isolated from: 76.8% were infected and 23.2% were colonised. Three-quarters (76.0%) of the 1594 patients with mMRSA were reported to be patients in a healthcare facility (HCF) or had been in a HCF in the previous three months.

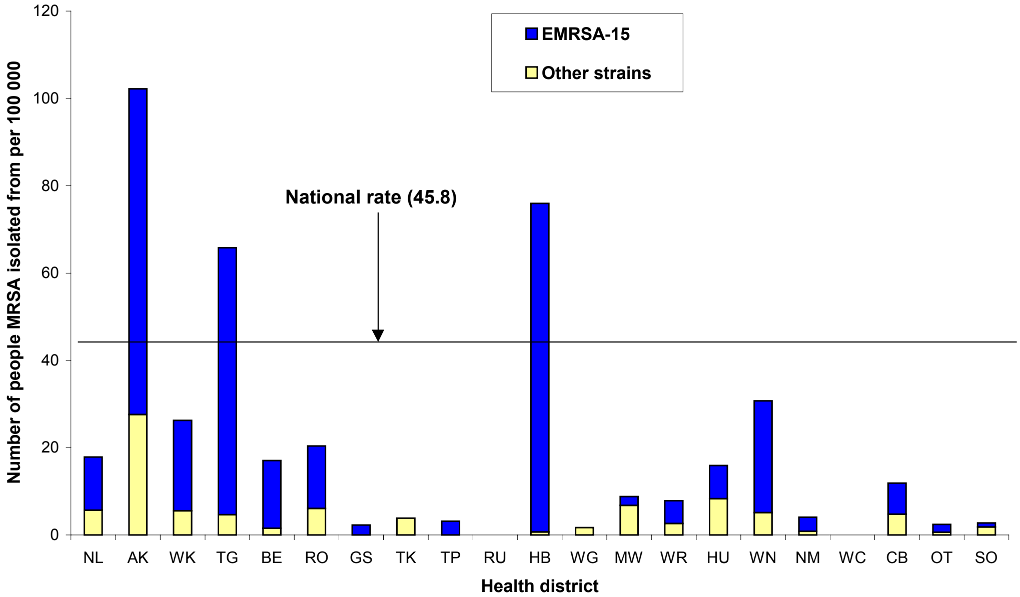
mMultiresistant MRSA isolations,
October 1998 - December 2001



Four mMRSA strains were predominant in 2001:

- EMRSA-15, a British epidemic mMRSA strain, was isolated from 1283 people and accounted for 75% of all mMRSA isolations, an increase from a proportion of 55% in 2000. This strain is typically isolated from elderly patients in hospital and other healthcare facilities.
- The AKMH1 and TANS2 strains were isolated from 102 people and accounted for 6.0% of all mMRSA isolations. These two strains are typical multiresistant Australian MRSA. The AKMH1 strain was first identified in 2001 in Middlemore Hospital patients and the TANS2 was first identified in patients in North Shore Hospital. The two strains cannot be reliably distinguished by phage typing, variously react with phages 83A, 84 and 85. They are distinguished by PFGE typing.
- The WR/AK1 strain was isolated 87 people and accounted for 5.1% of all mMRSA isolations. This strain is most commonly isolated from children either in the community or hospital in the Auckland area.

Incidence of multiresistant MRSA by health district, 2001



The geographic distribution of mMRSA in 2001 displayed the usual pattern, with the highest rate in the Auckland area. The next highest rates were in the Hawkes Bay and Tauranga Health Districts and were comprised largely of EMRSA-15 isolations. Compared with 2000, there was a notable decrease in rates in the Wellington and Hutt Health Districts following a decrease in EMRSA-15 isolations in the hospitals in these districts and the control of an outbreak of another mMRSA strain which was prevalent in 1999-2000.

The susceptibility of a representative sample mMRSA to an extended range of antibiotics was tested and the resistance among each predominant strain is shown in Table 1. The typical antibiogram for the EMRSA-15 strain is ciprofloxacin and erythromycin resistance, although there are also nonmultiresistant EMRSA-15 which are sensitive to erythromycin. The WR/AK1 strain is characteristically resistant to mupirocin and fusidic acid. The AKMH1 and TANS2 strains have the same resistance pattern: ciprofloxacin, clindamycin, co-trimoxazole, erythromycin, gentamicin and tetracycline resistance.

Table 1. Resistance among multiresistant MRSA strains, 2001

Antimicrobial agent (resistance breakpoint, mg/L)	Percent resistance				
	EMRSA-15 (n=372)	**WR/AK1 (n=85)**	**AKMH1 (n=59)**	**TANS2 (n=37)**	**Other (n=255)**
Chloramphenicol (MIC ≥32)	0.3	0	0	0	5.1
Ciprofloxacin (MIC ≥4)	100	0	100	100	58.7
Clindamycin (MIC ≥4)	9.1[1]	0	100	100	64.5
Co-trimoxazole (MIC ≥4/76)	0	0	98.3	100	40.6
Erythromycin (MIC ≥8)	100[2]	3.5	100	100	91.3
Fusidic acid (MIC ≥2)	2.4	100	0	0	15.2
Gentamicin (MIC ≥16)	0.3	0	100	91.9	47.8
Mupirocin (MIC ≥8)[3]	1.3	100	0	0	26.1
Rifampicin (MIC ≥4)	0.8	0	1.7	13.5	9.1
Tetracycline (MIC ≥16)	1.1	1.2	98.3	100	61.6
Vancomycin (MIC ≥32)	0	0	0	0	0

[1] EMRSA-15 demonstrates inducible clindamycin resistance by the disc diffusion induction test.
[2] There is variation in macrolide sensitivity among EMRSA-15, with some isolates being sensitive to erythromycin. These isolates are not categorised as multiresistant and are therefore not included in this analysis of mMRSA.
[3] Includes low-level (MIC 8-256 mg/L) and high-level (MIC ≥512 mg/L) mupirocin resistance.

Mumps

A total of 56 cases of mumps was notified and a total of 22 cases was laboratory-reported[1] in 2001. Matching of notified and laboratory-reported cases indicated that seven cases were both notified and laboratory-reported. In comparison, during 2000, 50 cases of mumps were notified and two cases were lab-reported.

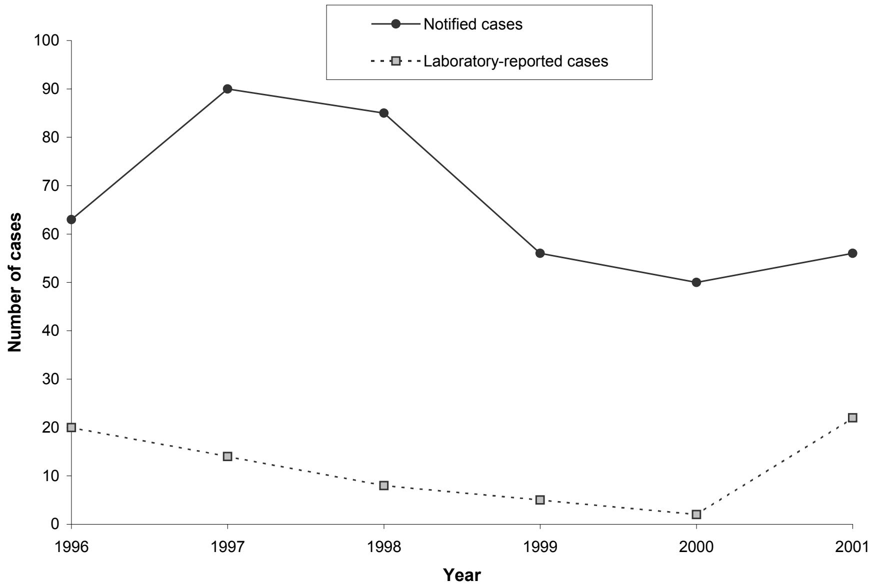
The rates of mumps varied throughout the country in 2001. Rates higher than the national average were recorded in Ruapehu (7.0 per 100 000), Eastern Bay of Plenty (6.1), Northland (5.0), Otago (4.2), Hawkes Bay (3.5), Hutt (3.0), South Canterbury (2.6), Canterbury (2.2), Wellington (1.6), and Rotorua (1.6) health districts.

Of the 56 cases notified during 2001, 53 (94.6%) had hospitalisation information recorded. Of these, 3.8% (2/53) were hospitalised.

[1] The number of laboratory-reported cases in 2001 is based on the date specimen was received by testing laboratory.

The last mumps epidemic peaked in 1994 when around 250 cases were laboratory-reported. Mumps became a notifiable disease in June 1996. The following graph shows the total number of laboratory-reported and notified cases each year since 1996.

Mumps notifications and laboratory-reported cases by year, 1996 - 2001



The following table shows the distribution of cases of mumps by age group and ethnicity. Of the 55 cases for whom gender was recorded 36 (65.5%) were male and 19 (34.5%) were female.

Mumps notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	1	3.4	0	0.0	0	0.0	0	0.0	0	1	1.8
1-4	6	4.9	9	16.8	3	15.6	0	0.0	1	19	8.8
5-9	5	3.0	5	7.6	3	12.7	0	0.0	6	19	6.6
10-14	5	2.8	3	4.8	0	0.0	0	0.0	1	9	3.1
15-19	0	0.0	2	4.0	1	5.5	0	0.0	0	3	1.1
20-29	2	0.7	0	0.0	0	0.0	0	0.0	0	2	0.4
30-39	1	0.3	0	0.0	0	0.0	0	0.0	0	1	0.2
40-49	2	0.5	0	0.0	0	0.0	0	0.0	0	2	0.4
50-59	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
60-69	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
70+	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
Unknown	0	-	0	-	0	-	0	-	0	0	-
Total	**22**	0.8	**19**	3.6	**7**	3.5	**0**	0.0	**8**	**56**	1.5

[1] Crude rate per 100 000, based on 2001 Census

No mumps cases notified in 2001 reported overseas travel during the incubation period for the disease. One case (3.1% of the 32 for which this information was recorded) reported contact with another case in the previous three weeks; and 32 cases (71.1% of the 45 cases for which the information was recorded) attended school, pre-school or childcare.

The recommended immunisation schedule for mumps in 2001 was two doses of MMR vaccine, the first given at 15 months and the second at 11 years of age. There was also a catch-up campaign to encourage the vaccination of children prior to school entry. Immunisation status was known for 89.3% (50/56) of cases notified during 2001. Of these, 80.0% (40/50) were immunised. The following table shows the number of doses of MMR vaccine given to mumps cases in each relevant age group.

Age group of mumps notifications and vaccination received 2001.

Age group	Total cases	Immunisation Status					
		1 dose	2 doses	3 doses	Immunised[1] (no dose info)	Not immunised	Immunisation status unknown
< 15 mths	2	0	0	0	0	2	0
15 mths - 4yrs	18	10	1	0	2	3	2
5 - 10 yrs	21	6	8	1	3	2	1
11+ yrs	15	5	2	0	2	3	3
Total	**56**	**21**	**11**	**1**	**7**	**10**	**6**

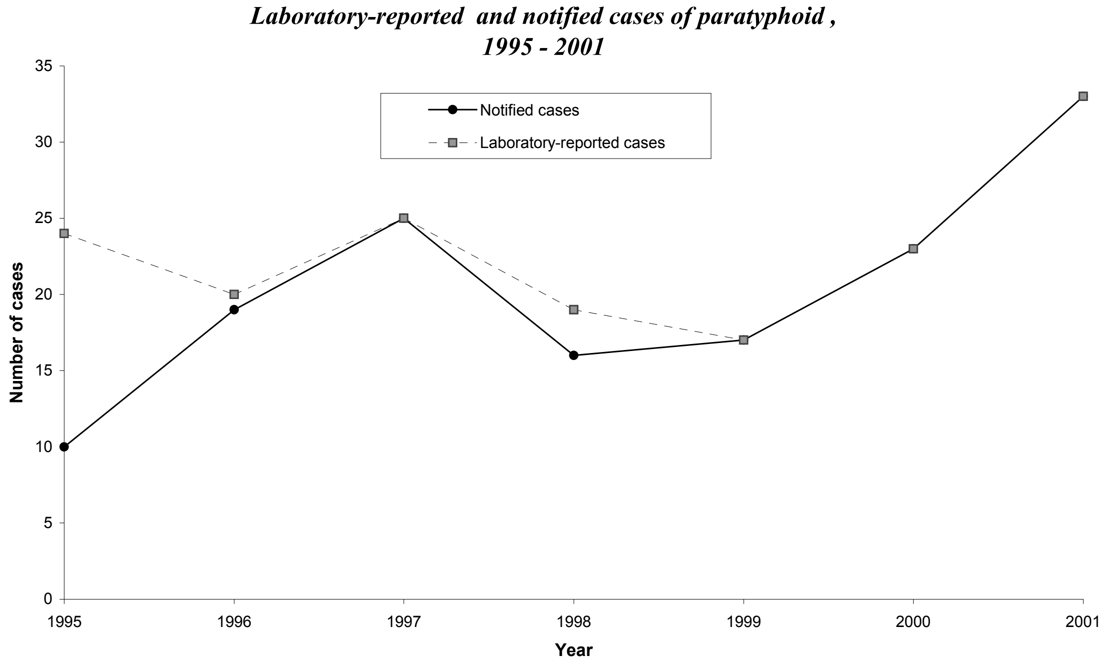
1 Case was immunised but the number of doses was not recorded

Paratyphoid

Thirty-three cases of *Salmonella* Paratyphi were notified in 2001. The 2001 rate of 0.9 per 100 000 was slightly higher than the 2000 rate of 0.6. Of the 30 cases for whom hospitalisation status was recorded, seven (23.3%) were hospitalised.

The Enteric Reference Laboratory at ESR received 33 *Salmonella* Paratyphi isolates in 2001. Two of the *Salmonella* Paratyphi isolates could not be matched to a notification and two notified cases had no corresponding lab isolate.

The following graph shows the number of notified and laboratory-reported cases of paratyphoid each year since 1995[1].



The majority of the cases (17/33) were 20-29 years of age. Twenty cases (60.6%) were male and thirteen (39.4%) were female.

Overseas travel information was recorded for 31 of the 33 cases. Twenty-three of the 31 cases (74.2%) were recorded as having travelled overseas during the incubation period for the disease. The countries visited were Bali (five cases), India (four), Thailand, Indonesia (three each), Australia (two), Bangladesh, Borneo, Malaysia, Taiwan, Thailand, and Vietnam (one each). The following table shows the rates of *Salmonella* Paratyphi among New Zealanders travelling overseas and the countries/regions visited.

Rates of Salmonella Paratyphi among New Zealanders travelling overseas and the countries/regions visited, 2001

Country / region	**Cases**	**Travellers**	**Rate (per 100 000 visits)**
Australia	2	682530	0.3
South East Asia	15	69904	21.5
North East Asia	1	80035	1.2
Southern and Central Asia	5	13108	38.1
Total	**23**	845577	2.7

Of the ten cases with no recorded history of overseas travel, two cases recorded contact with a confirmed case of the disease.

[1] *Note that prior to 1995, cases were often notified as salmonellosis rather than paratyphoid.*

Pertussis

A total of 1335 cases of pertussis was notified in 2001. Of these, 617 (46.2%) were recorded on EpiSurv as having been confirmed by isolation of *Bordetella pertussis,* and an additional 165 (12.4%) were recorded as having had contact with a confirmed case of pertussis. A further 334 pertussis notifications were classified as 'probable' cases. In comparison, during 2000 there were 4140 notified cases, 62.1% of whom were confirmed (i.e. by isolation or by being epidemiologically linked to a confirmed case).

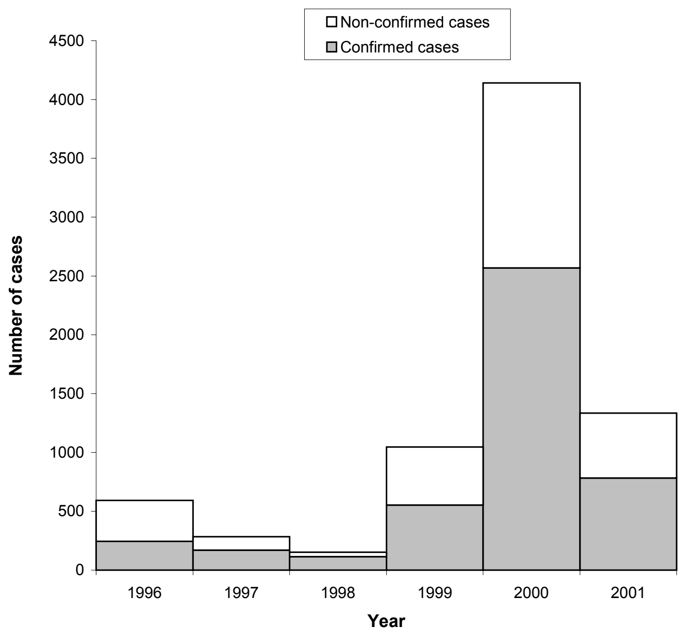
The 2001 rate of 35.7 per 100 000 is significantly (Chi-square, p<0.001) lower than the 2000 rate of 110.8 cases per 100 000.

Hospitalisation information was recorded for 1236 of the 1335 cases. Of these, 7.4% (92/1236) were hospitalised. There were no deaths reported.

A total of five outbreaks was of pertussis was reported in 2001 involving 17 cases.

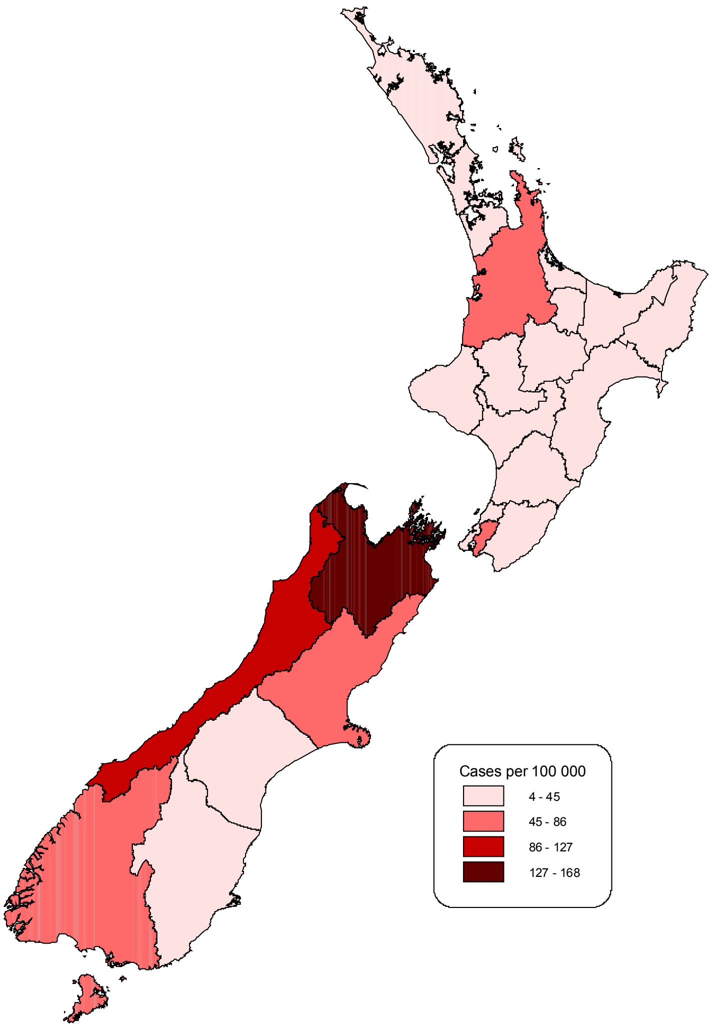
Pertussis first became notifiable in June 1996. The following graph shows the number of notified and laboratory confirmed cases, each year since 1996.

Notified cases of pertussis by year, 1996 - 2001



Rates higher than the national average were recorded in Nelson-Marlborough (168.3), West Coast (112.1), Hutt (78.1), Waikato (65.8), Southland (51.8), Canterbury (46.1), Wellington (40.6), Otago (39.1), South Canterbury (38.4), and Wairarapa (36.6) health districts.

The following map shows the rates of pertussis by health district.



The following table shows the distribution of cases of pertussis by age group and ethnicity. In 2001, gender was recorded for 1317 (98.7%) of the 1335 cases. Of these, 608 cases (46.2%) were male and 709 (53.8%) were female.

Pertussis notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	69	231.9	48	343.1	27	523.6	1	26.9	11	156	285.5
1-4	231	189.9	34	63.5	7	36.5	6	42.8	41	319	147.6
5-9	283	167.5	26	39.3	6	25.4	9	48.9	40	364	127.2
10-14	101	56.9	10	15.9	3	13.8	3	14.9	6	123	42.3
15-19	35	21.8	5	10.1	1	5.5	1	3.6	7	49	18.5
20-29	50	16.4	5	6.1	1	3.0	0	0.0	13	69	14.2
30-39	87	21.9	11	14.2	0	0.0	2	4.4	9	109	18.9
40-49	64	16.1	6	10.3	0	0.0	2	5.3	8	80	14.9
50-59	28	8.4	3	9.0	0	0.0	1	5.1	5	37	8.8
60-69	17	7.3	1	5.1	0	0.0	0	0.0	0	18	6.4
70+	4	1.4	0	0.0	0	0.0	2	35.7	0	6	1.9
Unknown	1	-	1	-	0	-	1	-	2	5	-
Total	**970**	37.1	**150**	28.5	**45**	22.5	**28**	11.3	**142**	**1335**	35.7

[1] Crude rate per 100 000, based on 2001 Census

Of the 1017 notified cases for which the information was recorded, 54.3% attended school, pre-school or childcare

During 2001 the recommended vaccination schedule for pertussis consisted of four doses given at six weeks, three months, five months and fifteen months of age[1]. Immunisation status was known for 78.1% (872/1116) of the probable or confirmed cases notified during 2001. Of these, 63.2% (705/1116) were immunised. The following table shows the number of doses of pertussis vaccine given to pertussis cases in each relevant age group.

Age group of pertussis notifications and vaccination received, 2001

Age group[3]	Total Cases[1]	Immunisation status[2]						
		One dose	Two doses	Three doses	Four doses	Immunised (no dose info)	Not immunised	Unknown status
0-6 weeks	28	(4)	(0)	(0)	(0)	1	19	4
6 wks-2 mths	28	11	(0)	(0)	(0)	1	10	6
3-4 months	38	16	8	(3)	(0)	0	6	5
5-14 months	102	4	6	44	(9)	11	25	3
15 mths-4 yrs	210	3	8	7	109	18	44	21
5+ years	709	10	6	116	175	135	62	205
Total	**1115**	**48**	**28**	**170**	**293**	**166**	**166**	**244**

1 This calculation was based only on probable and confirmed cases only.
2 Bracketed numbers indicate cases ineligible for vaccination
3 One case had unknown age.

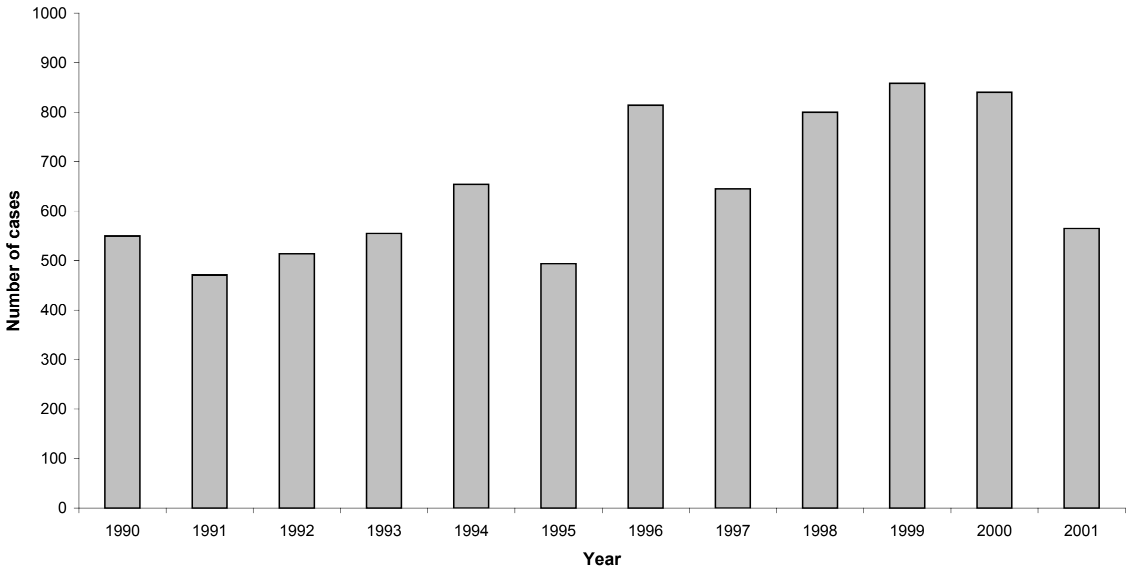
[1] *As of 2002, an additional pertussis vaccination prior to school entry is also recommended.*

Respiratory Syncytial Virus (RSV)

Cases of respiratory syncytial virus (RSV) are not notifiable and information on the number of cases is only available through national collation of respiratory specimen numbers recorded from Auckland, Waikato, ESR, and Christchurch and Dunedin virus laboratories.

During 2001, a total of 565 cases of RSV were laboratory reported, compared to 840 cases during 2000. The following graph shows the number of laboratory-confirmed RSV cases each year since 1990.

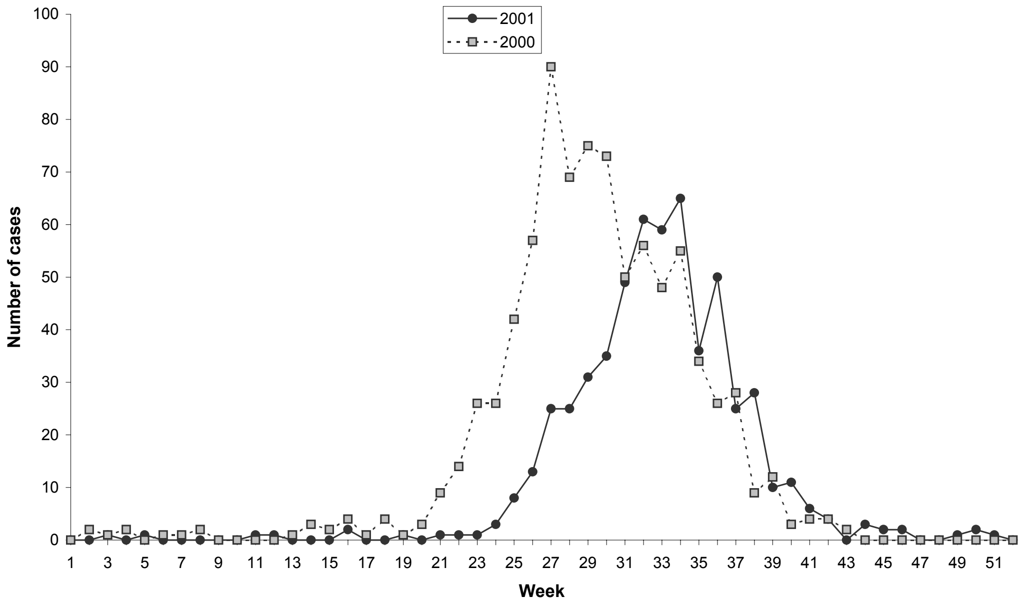
Annual laboratory-reported RSV cases, 1990-2001



In 2001, the RSV activity peaked in weeks 32-34 (August), 5 weeks later than the peak in 2000. Activity remained at a high level until week 36 (early September), after which time the number of RSV cases began to rapidly decline.

The following graph illustrates the number of RSV cases reported each week during 2000 and 2001.

RSV laboratory-reported cases by week, 2000 and 2001

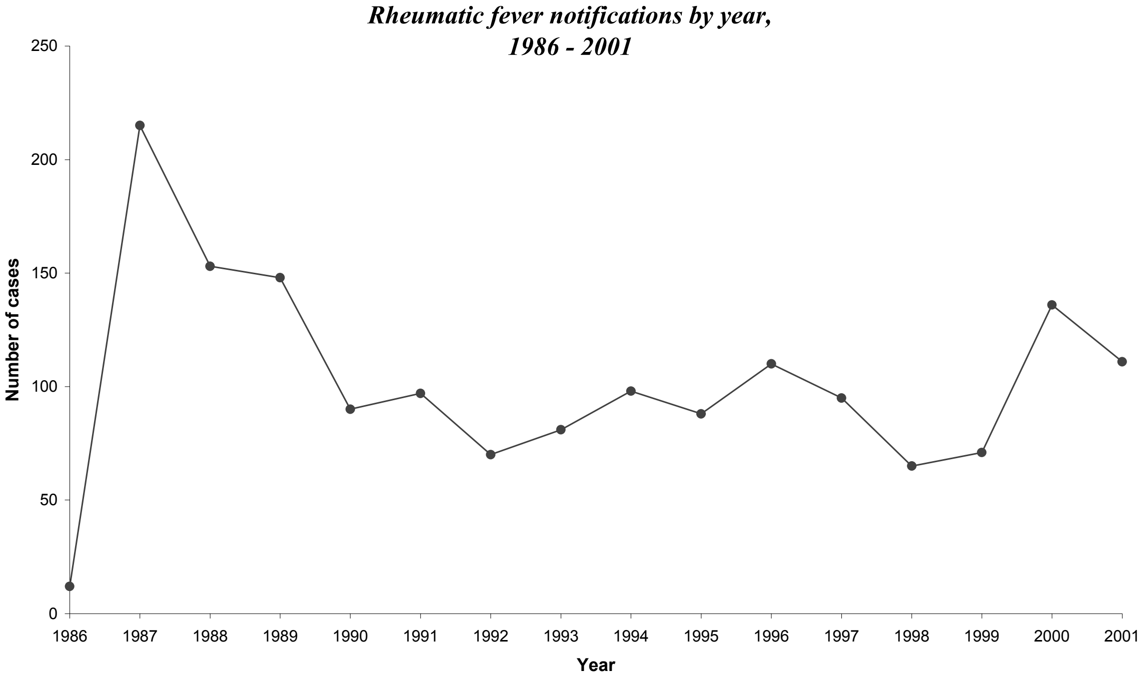


Rheumatic fever

A total of 111 new cases and three recurrences of rheumatic fever was notified in 2001. Of the 111 new cases, 79.3% were aged under 14 years. The rate of new cases in 2001 of 3.0 per 100 000 was slightly lower than the 2000 rate of 3.6. Of the 44 cases for whom hospitalisation status was recorded, 41 (93.2%) were hospitalised.

A qualification on the incidence in 2001 is that, of the 104 cases for whom date of onset of illness was recorded, 13 (12.5%) were notified between 6 and 12 months after the onset of illness, and 10 (9.6%) were notified more than a year after onset of illness. In comparison, 22.2% of the rheumatic fever notifications in 2000 (for which onset date was recorded) were notified between 6 and 12 months of onset of illness, and 23.9% were notified more than a year after onset of illness.

The following graph shows rheumatic fever notifications[1] by year since 1986.



*Rheumatic fever became notifiable during 1986

The rates of new cases of rheumatic fever varied throughout the country in 2001. Rates above the national average were recorded in Eastern Bay of Plenty (16.3 per 100 000), Central Auckland (9.8), South Auckland (7.2), Northland (7.1), Ruapehu (7.0), Wanganui (3.4) and Taupo (3.2) health districts. No cases of rheumatic fever were notified from the South Island in 2001.

The following table shows the distribution of new cases of rheumatic fever by age group and ethnicity. Gender was recorded for 75 (65.8%) of the 114 cases. Of these 38 cases (50.7%) were male and 37 (49.3%) were female.

New cases of rheumatic fever by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
1-4	1	0.8	2	3.7	0	0.0	0	0.0	0	3	1.4
5-9	1	0.6	19	28.7	13	55.1	1	5.4	3	37	12.9
10-14	0	0.0	27	42.9	18	83.1	1	5.0	2	48	16.5
15-19	0	0.0	2	4.0	6	33.1	0	0.0	1	9	3.4
20-29	1	0.3	1	1.2	5	14.8	1	2.3	0	8	1.6
30-39	0	0.0	1	1.3	5	15.8	0	0.0	0	6	1.0
40-49	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
50-59	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
60-69	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
70+	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
Unknown	0	-	0	-	0	-	0	-	0	0	-
Total	**3**	**0.1**	**52**	**9.9**	**47**	**23.5**	**3**	**1.2**	**6**	**111**	**3.0**

1 Crude rate per 100 000, based on 2001 Census

[1] *New cases and recurrences*

The three recurrent cases in 2001 were aged 12, 14, and 26 years. Two cases were male and one was female. Two were notified from South Auckland health district and the third from Gisborne health district. All recurrent cases were hospitalised.

Ross River virus infection

Three cases of Ross River virus infection were notified in April, May and October of 2001. All three cases were laboratory confirmed. This brings the total number of cases reported since the disease became notifiable in the late 1970s to nine. The other six cases were notified in 1980, 1997, 1998, 1999, and 2000 (2 cases).

Two of the 2001 cases were males, aged 59 and 72 years, and the third case was a 73 year old female. One male case had recently returned from Thailand, and the other had been in Australia. The female case had travelled to Fiji. Of the two cases for which hospitalisation status was known, one was hospitalised.

Rickettsial disease

Five cases of rickettsial disease were notified during 2001. All cases have been serologically confirmed. In comparison, ten cases were notified in 2000[1], eight of whom were laboratory confirmed. The only other prior notification was in 1997[2].

Of the five 2001 cases, four were reported from North West Auckland Health District, and one case from Waikato Health District[3]. All were confirmed by serology to be murine typhus, and all cases were hospitalised[4].

The five cases were a 28 year old European female, a 53 year old female of unknown ethnicity, and European males aged 47, 65 and 83.

No cases indicated overseas travel during the incubation period. Probable sources of infection were reported for the four Auckland cases, all of whom were thought to have become infected through contact with rats and/or pet cats living on their respective properties.

[1] It should be noted that six of the ten cases notified during 2000 were 'late notifications' - the earliest recorded onset date being September 1989.
[2] All cases of rickettsial disease (with the exception of one case notified in October 2001) have been reported from the combined Auckland health districts.
[3] The case reported from Waikato Health District resides in the Coromandel.
[4] Although EpiSurv only recorded serology results and hospitalisation status for four of the five cases in 2001, information for all five has been obtained from laboratory sources. See the New Zealand Public Health Report 2001; 8: 73-5.

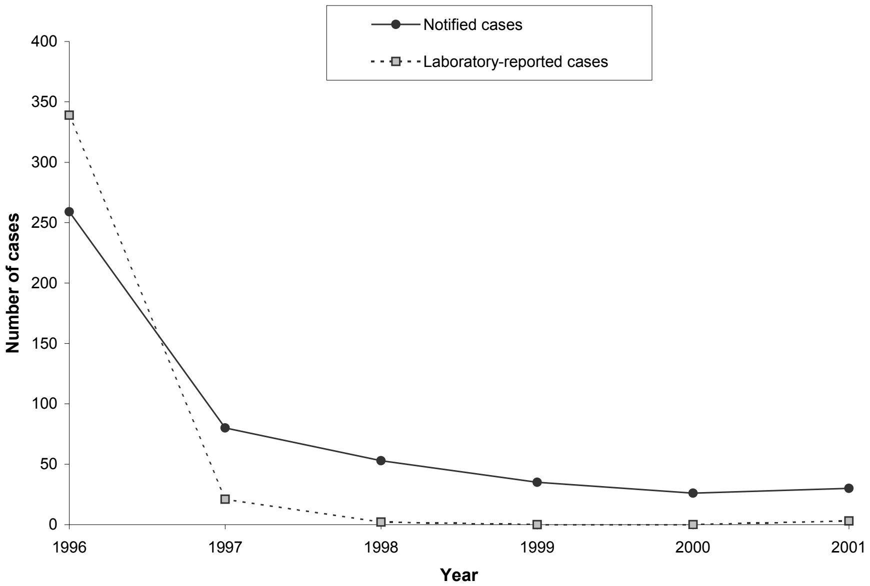
Rubella and congenital rubella syndrome

A total of 30 cases of rubella was notified in 2001 and a total of 3 cases was laboratory-reported[1] in 2001. Matching of notified and laboratory-reported cases indicated that one case was both notified and laboratory-reported. In comparison, during 2000, 26 cases of rubella were notified and no cases were laboratory-reported.

Hospitalisation information was recorded for 24 notified cases, none of which were hospitalised.

The last epidemic of rubella peaked in 1995 when over 1600 cases were laboratory-reported. Rubella became a notifiable disease in June 1996. The following graph shows the total number of laboratory-reported and notified cases each year since 1996.

Rubella notifications and laboratory-reported cases by year, 1996 - 2001



The rates of rubella varied throughout the country in 2001. Rates higher than the national average were recorded in Hawkes Bay (7.0), Southland (1.9), Canterbury (1.7), Wellington (1.6) and Taranaki (1.0) health districts.

The following table shows the distribution of notified cases of rubella by age group and ethnicity. Thirteen cases (43.3%) were male and 17 (56.7%) were female.

[1] The number of laboratory-reported cases in 2001 is based on the date specimen was received by testing laboratory.

Rubella notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	12	40.3	1	7.1	0	0.0	0	0.0	4	17	31.1
1-4	4	3.3	2	3.7	0	0.0	0	0.0	2	8	3.7
5-9	1	0.6	0	0.0	0	0.0	0	0.0	1	2	0.7
10-14	1	0.6	0	0.0	0	0.0	0	0.0	0	1	0.3
15-19	1	0.6	0	0.0	0	0.0	0	0.0	0	1	0.4
20-29	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
30-39	1	0.3	0	0.0	0	0.0	0	0.0	0	1	0.2
40-49	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
50-59	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
60-69	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
70+	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
Unknown	0	-	0	-	0	-	0	-	0	0	-
Total	**20**	0.8	**3**	0.6	**0**	0.0	**0**	0.0	**7**	**30**	0.8

[1] Crude rate per 100 000, based on 2001 Census

No rubella cases notified in 2001 reported overseas travel during the incubation period for the disease. One case (6.3% of the 16 for which this information was recorded) reported contact with another case in the previous three weeks; and nine cases (37.5% of the 24 cases for which the information was recorded) attended school, pre-school or childcare

The recommended immunisation schedule for rubella in 2001 was two doses of MMR vaccine, the first given at 15 months and the second at 11 years of age. There was also a catch-up campaign to encourage the vaccination of children prior to school entry. Immunisation status was known for 83.3% (25/30) of cases notified during 2001. Of these, 36.0% (9/25) were immunised. The following table shows the number of doses of MMR vaccine given to rubella cases in each relevant age group.

Age group of rubella notifications and vaccination received, 2001

Age group	Total cases	Immunisation Status					
		1 dose	2 doses	3 doses	Immunised[1] (no dose info)	Not immunised	Immunisation status unknown
< 15 mths	20	0	0	1	0	16	3
15 mths - 4yrs	5	3	0	0	2	0	0
5 - 10 yrs	3	2	0	0	0	0	1
11+ yrs	2	1	0	0	0	0	1
Total	**30**	**6**	**0**	**1**	**2**	**16**	**5**

1 Case was immunised but the number of doses was not recorded

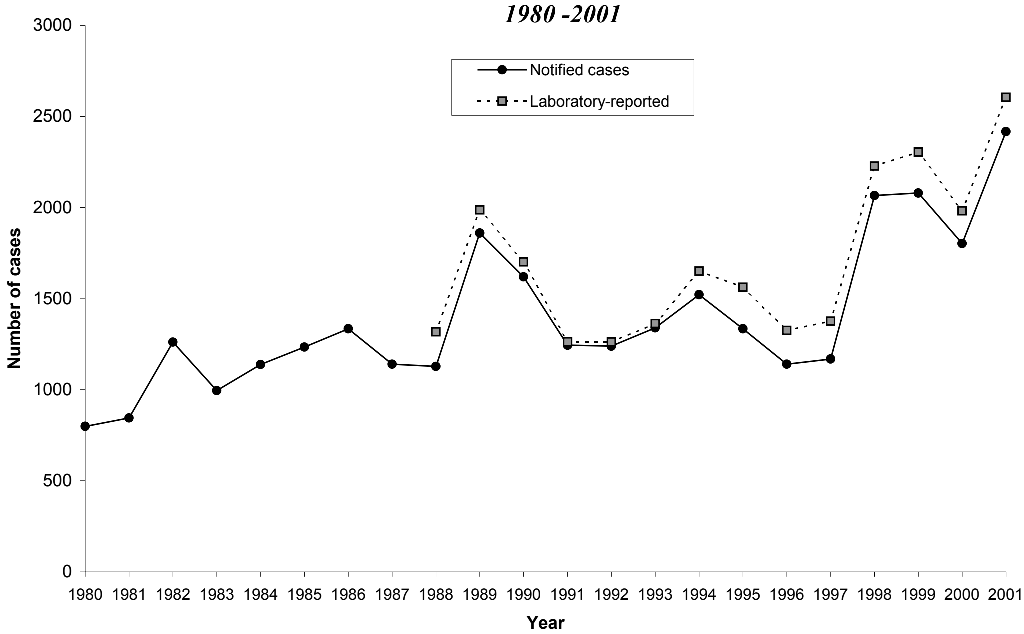
Salmonellosis

A total of 2417 cases of salmonellosis was notified in 2001. The Enteric Reference Laboratory at ESR received 2605 *Salmonella* isolates. The 2001 notification rate of 64.7 cases per 100 000 is significantly (Chi-square, p<0.001) higher than the 2000 rate of 48.1. Of the 1934 cases for whom hospitalisation status was recorded, 279 (14.4%) were hospitalised. There were two deaths from salmonellosis reported in 2001, giving a case fatality rate of 0.1%.

A total of 37 outbreaks of salmonellosis was reported in 2001 involving 214 cases. The outbreaks were reported from 15 health districts. The majority of the outbreaks (15/37) were from the Auckland health districts.

The following graph shows the number of laboratory-reported cases of salmonellosis by year since 1988 and the number of notified cases since 1980.

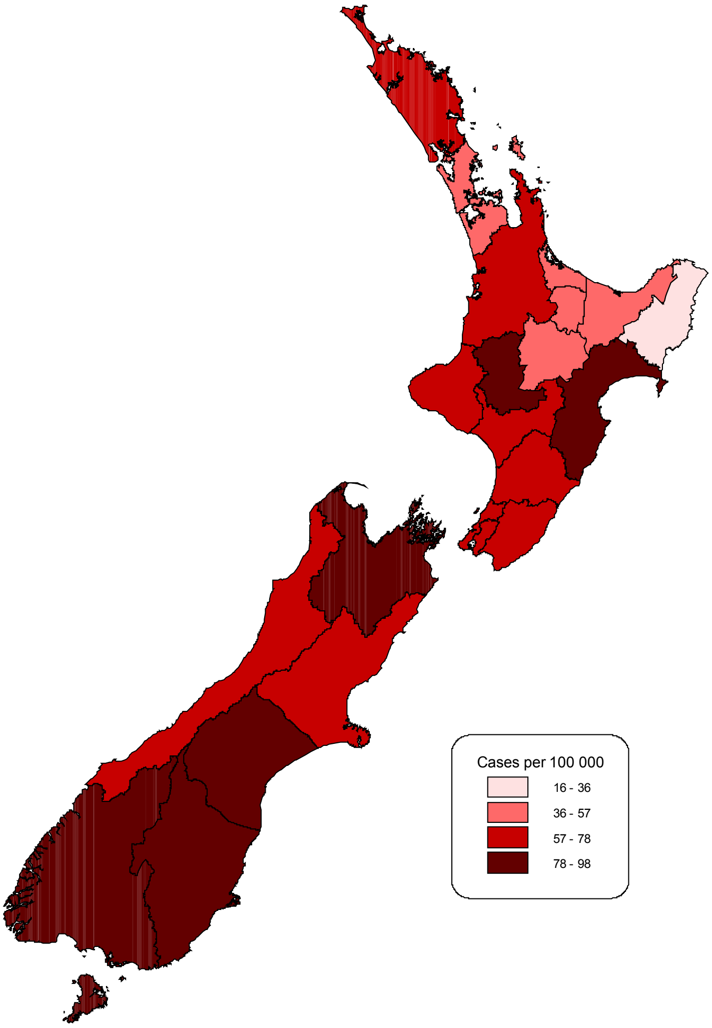
Salmonellosis notified and laboratory-reported cases by year, 1980 -2001



*Laboratory data only available since 1988

The rate of salmonellosis varied throughout the country in 2001. Rates higher than the national average were recorded in Otago (98.1 per 100 000), Ruapehu (98.0), South Canterbury (96.0), Nelson Marlborough (93.2), Hawkes Bay (92.6), Southland (91.6), West Coast (75.8), Taranaki (72.7), Wellington (72.5), Wanganui (71.9), Hutt (66.0), and Wairarapa (65.3) health districts.

The following map shows the rates of salmonellosis by health district.



The following table shows the distribution of cases of salmonellosis by age group and ethnicity. Gender was recorded for 1776 (98.6%). Of these, 879 cases (49.5%) were male and 897 (50.5%) were female. Age was recorded for 2411 of the salmonellosis cases. As in 2000, the peak age-specific rate of notified salmonellosis in 2001 occurred among children aged under one year (316.6 cases per 100 000). The rate in this age-group had increased from that in 2000 (210.2). Overall, 28.7% (293/2411) of salmonellosis cases with recorded age occurred among children aged less than five years, in increase from 24.4% (438/1795) in 2000.

Salmonellosis notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	103	346.2	19	135.8	5	97.0	15	403.6	31	173	316.6
1-4	334	274.6	53	99.0	10	52.2	32	228.1	91	520	240.6
5-9	170	100.6	12	18.1	7	29.6	8	43.5	40	237	82.8
10-14	98	55.2	11	17.5	1	4.6	5	24.8	19	134	46.1
15-19	88	54.8	9	18.2	1	5.5	6	21.4	19	123	46.4
20-29	194	63.5	18	21.9	6	17.7	16	36.8	68	302	62.0
30-39	186	46.8	30	38.7	12	37.8	10	21.9	49	287	49.8
40-49	179	45.0	13	22.4	11	50.4	16	42.3	41	260	48.4
50-59	130	38.9	12	36.1	3	22.5	5	25.6	19	169	40.4
60-69	79	34.0	5	25.6	4	53.5	3	27.2	17	108	38.2
70+	78	27.1	3	31.0	1	22.6	2	35.7	14	98	30.4
Unknown	1	-	0	-	1	-	0	-	4	6	-
Total	**1640**	**62.8**	**185**	**35.1**	**62**	**31.0**	**118**	**47.7**	**412**	**2417**	**64.7**

[1] Crude rate per 100 000, based on 2001 census

Among the 2417 notified cases, 11.7% (218 of the 1864 for which this information was recorded) had been overseas during the incubation period, 15.0% (232/1546) had recreational water contact, 21.7% (312/1438) had consumed untreated water, 9.3% (224/2417) had contact with animals, 8.3% (118/1426) had contact with sick animals, 20.3% (258/1271) had faecal contact, 4.7% (87/1849) were food handlers and 17.0% (272/1597) had contact with a symptomatic case.

Of the 2605 cases of salmonellosis identified from isolates received by the ERL in 2001, predominant serotypes were *Salmonella* Typhimurium phage type 160 (791 isolates, 30.4%), *S.* Typhimurium phage type 135 (264, 10.1%), *S.* Typhimurium phage type 1 (171, 6.6%), *S.* Brandenburg (137, 5.3%), *S.* Heidelberg (127, 4.9%) and *S.* Typhimurium phage type 156 (111, 4.3%). Notable changes from 2000 include increases in the number of *S.* Typhimurium phage type 160 (from 180 isolates), *S.* Typhimurium phage type 1 (from 146 isolates) and *S.* Heidelberg (from three isolates), and decreases in *S.* Typhimurium phage type 135 (from 420 isolates) and *S.* Brandenburg (from 184 isolates).

Salmonella Typhimurium phage type 160 outbreak investigation

A nationwide investigation of the increased number of Salmonella Typhimurium DT160 cases was conducted during 2001. A summary of the investigation is provided below, and full information is available in the final report[20].

Background: Forty-five cases of *Salmonella* Typhimurium DT160 (STM160) were identified during May 2001. The increasing incidence due to this *Salmonella* strain, particularly in Auckland, and the high frequency of raw egg consumption suggested a possible dispersed common source of infection.

Methods: A case-control study and environmental investigation were undertaken to identify the source of this outbreak. The environmental investigation involved sampling shell eggs and roof-collected rainwater supplies of exposed cases in Auckland, and an investigation of egg farms (described in a companion report). For the case-control study cases were identified from *Salmonella* isolates received by the Enteric Reference Laboratory at ESR. All cases with onset of illness after 28 April and notified before 31 August 2001 were eligible for inclusion. Age and suburb matched controls were identified from residential telephone directories. Two controls were matched with each case. Cases and controls were interviewed by telephone by public health service staff using a standardised questionnaire. Matched analyses were done using SAS statistical software.

Results: In the investigation of roof-collected rainwater supplies, eight Auckland residential supplies were tested. STM160 was isolated from four of these supplies. In the investigation of shell eggs, samples were collected of six different egg brands. *Salmonella* species, although not STM160, were isolated from shell surface samples of two brands. Of the individuals identified by the ERL as culture positive for STM160 from participating health districts during the study period, 66.1% (119/180) were included in the study. Contact with wild birds (matched odds ratio [mOR] = 12.3, 95% confidence interval [CI]: 2.8-54.6), contact with another individual with diarrhoea and vomiting in the prior 28 days (mOR = 3.1, CI: 1.7-5.7), and consumption of takeaway food (mOR = 1.7, CI: 1.04-2.8) were all found to have a significant and independent association with infection. Takeaway food consumption alone explained 27% of illness, contact with an ill person explained 13% and contact with a wild birds 11% It was not possible to obtain valid epidemiological estimates of risk associated with roof-collected rainwater supplies.

Conclusion: Wild bird contact, takeaway food consumption, and person-to-person transmission all have important associations with the recent epidemic of STM160. The high proportion of roof-collected rainwater supplies contaminated by STM160 suggests that this is also an important source of illness that could also be plausibly linked to the STM160 outbreak that was occurring in birds at the same time. No single common source was identified, suggesting that the pathogen has come to occupy a range of ecological niches. Recommendations are made for emphasising the importance of personal hygiene, close attention to the investigation of future outbreaks especially when takeaway foods are implicated, and prompt investigation of future emerging *Salmonella* serotypes.

Sexually transmitted infections (STIs)

KEY POINTS

- Rates and number of cases of **Chlamydia** infection, the commonest bacterial STI in New Zealand, are still increasing in such a way that it will soon overtake the occurrence of genital warts.

- The higher risk groups, by STI, are:

Chlamydia:	• Maori and Pacific people; • Males aged 15-24 (although the highest number of cases is amongst females aged 15-24)
Gonorrhoea:	• Maori and Pacific peoples • Males aged <20
Genital herpes:	• Maori and Europeans • Older age-groups, as this is a lifelong condition
Genital warts:	• Across all ethnic groups • Males aged 15-24

Sexual Health Clinics (SHCs)

National data on sexually transmitted infections are reported in full in the STI Surveillance Data Annual Report, 2001, soon to be published. Consequently, data for SHCs in this report should be taken as provisional. Key findings are summarised below:

In 2001, the 32 sexual health clinics reported 8785 STI cases from 76 257 clinic visits (11.5%). This was an increase in STI cases of 9% compared to 2000. Genital warts was the most commonly diagnosed STI (4.3% of clinic visits), followed by confirmed chlamydia (4.2%), NSU in males (1.4%), genital herpes (0.8%), confirmed gonorrhoea (0.7%), and syphilis (0.03%). No cases of chancroid, granuloma inguinale or lymphogranuloma venereum were reported during 2001.

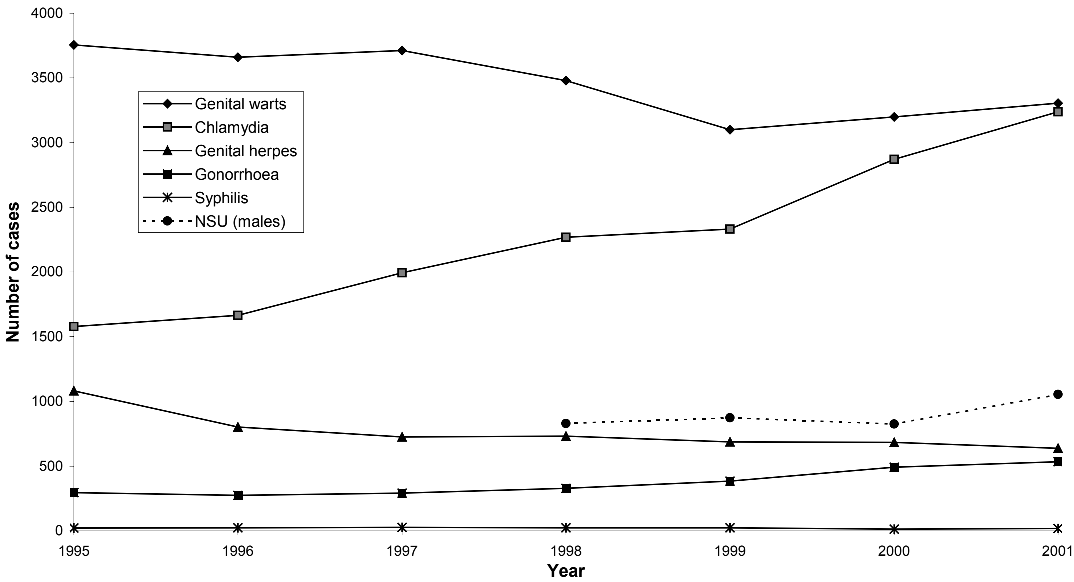
Confirmed STI rates at sexual health clinics during 2000 and 2001..

Infection	2001 Cases	2001 Rate[1]	2000 Cases	2000 Rate[1]
Chlamydia	3 238	4.2%	2 870	3.9%
Gonorrhoea	533	0.70%	491	0.67%
Genital herpes	638	0.84	658	0.90%
Genital warts	3 304	4.3%	3 181	4.3%
Syphilis	18	0.02%	13	0.02%
NSU (males only)	1 054	3.4%	825	2.7%
Total STI cases	**8 785**	**11.5%**	**8 038**	**11.0%**
Total clinic visits	76 257		73 135	

[1]Number of cases divided by total number of clinic visits. For NSU, number of cases divided by number of male clinic visits (31 039 in 2001 and 30 696 in 2000).

The following graph shows the annual number of confirmed STI cases reported by sexual health clinics from 1995 to 2001.

Number of confirmed cases of STIs reported by Sexual Health Clinics by year, 1995 - 2001



Between 2000 and 2001 confirmed chlamydia cases increased by 13%, and over the period 1995 to 2001 the number of cases of chlamydia more than doubled. Rates (defined as number of cases by sex and in an aged group over the number of visits by sex) were higher in males in the 15-19 age group, followed by males aged 20-24. Between 2000 and 2001 confirmed gonorrhoea cases increased by 8% continuing the higher increase seen since 1999.

The number of genital herpes cases decreased between 1995 and 1997, but remained relatively stable from 1997 onwards. During 2001 there were 638 reported cases of herpes, a 9% decrease compared to 2000. Genital warts cases showed a steady decrease in 1998 and 1999. During 2000 and 2001 there has been a slight but continued increase in the number of genital warts cases (3304 cases in 2001, 3% higher than 2000). With little change in the number of syphilis cases between 1995 and 1999, the drop seen in the case numbers from 1999 to 2000 has reversed during 2001 with an increase of 38% (18 cases in 2001 vs. 15 in 2000). There has been a substantial increase of 28% in the number of NSU cases in males reported during 2001 compared to 2000.

The number of chlamydia cases are taking over the number of genital warts (3238 versus 3304, respectively) as the most common reported STI. The same pattern can be seen occurring between gonorrhoea (533 cases in 2001, an increase of 8%) and genital herpes (638 cases in 2001, a decrease of 3%)

Family Planning Clinics

During 2001, the 37 Family Planning Association (FPA) clinics and 3 non-FPA clinics reported 202 325 visits, of which 2011 were confirmed STI cases, representing 1% of all attendees. Chlamydia (56%) was the most common diagnosis, followed by genital warts (25%), gonorrhoea (10%), and genital herpes (7%). For chlamydia and gonorrhoea, numbers and rates were higher in the 15-19 year-old group, followed by the 20-24 year-old group. For genital herpes and warts, the higher numbers and rates were found in those aged 20-24.
It is not possible to compare family planning clinics data with that of sexual health clinics due to major differences in attendance patterns, and screening practices. Family planning clinics are attended mainly by females and diagnosis and treatment of STIs is only one of the services they provide. Likewise, it is not possible to compare 2001 with previous years, as 2001 was the first time information had been collected for a complete year.

Students & Youth Health Clinics

Of the 147 385 visits in 2001, just over 0.3% (453) were diagnosed with an STI. The low infection rate seen at these clinics compared to SHCs and family planning clinics is due to Students & Youth clinics providing services for a wide range of conditions other than STIs. Chlamydia was the most common diagnosis, followed by genital warts, genital herpes, and gonorrhoea.

Confirmed STI rates at family planning clinics and student and youth health clinics during 2001.

	Family Planning Clinics		Student & Youth Health Clinics	
Infection	2001 Cases	2001 Rate[1]	2001 Cases	2001 Rate[1]
Chlamydia	1 135	0.56%	304	0.21%
Gonorrhoea	209	0.10%	24	0.02%
Genital herpes	151	0.07%	37	0.03%
Genital warts	508	0.25%	86	0.06%
Syphilis	2	<0.01%	0	-
NSU (males only)	6	0.08%	2	<0.01%
Total STI cases	**2 011**	**1.0%**	**453**	**0.31%**
Total clinic visits	76 257		147 385	

[1]Number of cases divided by total number of clinic visits. For NSU, number of cases divided by number of male clinic visits (7 452 for FPC and 30 696 in 2000).

Laboratory Surveillance

Additional laboratory-based surveillance is operating for chlamydia and gonorrhoea in Auckland, Waikato, and Bay of Plenty.

Chlamydia – Because the majority of chlamydial infections are asymptomatic, particularly in females, rates calculated using laboratory data reflect the screening practises of clinicians rather than true disease incidence.

In 2001, laboratories in the Waikato and Bay of Plenty (BOP) tested 39 283 specimens for chlamydia, and reported 3265 (8.3%) positive cases giving an estimated population rate of 592 per 100 000. Rates of chlamydia in females (841 per 100 000) in the Waikato and Bay of Plenty were 2.5 times higher than rates in males (329 per 100 000). The mean age of chlamydia cases was 23.2 years. Over two-thirds (72%) of all chlamydia cases were aged 15-24 years. Ninety-seven cases of chlamydia were reported in people aged less than 15 years. The highest rates of chlamydia were in females aged 15-19 years (5293 per 100 000), followed by females aged 20-24 years (4743 per 100 000).

Laboratories in the Auckland region started to report cases of chlamydia in 2001, during which 104 544 specimens were tested with 5448 positive specimens belonging to 5403 patients. The mean age was 25 years, and three quarters of all cases were females. Over half (56%) of chlamydia cases occurred in people aged 15-24, and 92 cases were reported in people aged less than 15 years.

Gonorrhoea – In 2001, laboratories in Waikato and Bay of Plenty reported 186 cases of gonorrhoea giving an estimated population rate of 34 per 100 000. Rates of gonorrhoea in males (39 per 100 000) in the Waikato and Bay of Plenty were 30% higher than rates in females (29 per 100 000), contrary to 2000 when female rates were higher than in males. The mean age of gonorrhoea cases was 23.4 years, with over two-thirds (64%) of all gonorrhoea cases aged 15-24 years. Five cases of gonorrhoea were reported in teenagers aged 13-14 years. The highest rates of gonorrhoea were in males aged 20-24 years (236 per 100 000), followed by females aged 15-19 years (177 per 100 000).
Laboratories in the Auckland region reported, in 2001, 730 cases of gonorrhoea giving an estimated population rate of 62 per 100 000. Rates of gonorrhoea were higher in males (81

per 100 000) in Auckland than in females (43 per 100 000). The mean age of gonorrhoea cases was 24 years. Over half (52%) of all gonorrhoea cases were aged 15-24 years. Eleven cases of gonorrhoea were reported in people aged less than 15 years. As in the previous year, the highest rates of gonorrhoea were in males aged 20-24 years (315 per 100 000), followed by females aged 15-19 years (218 per 100 000).

Shigellosis

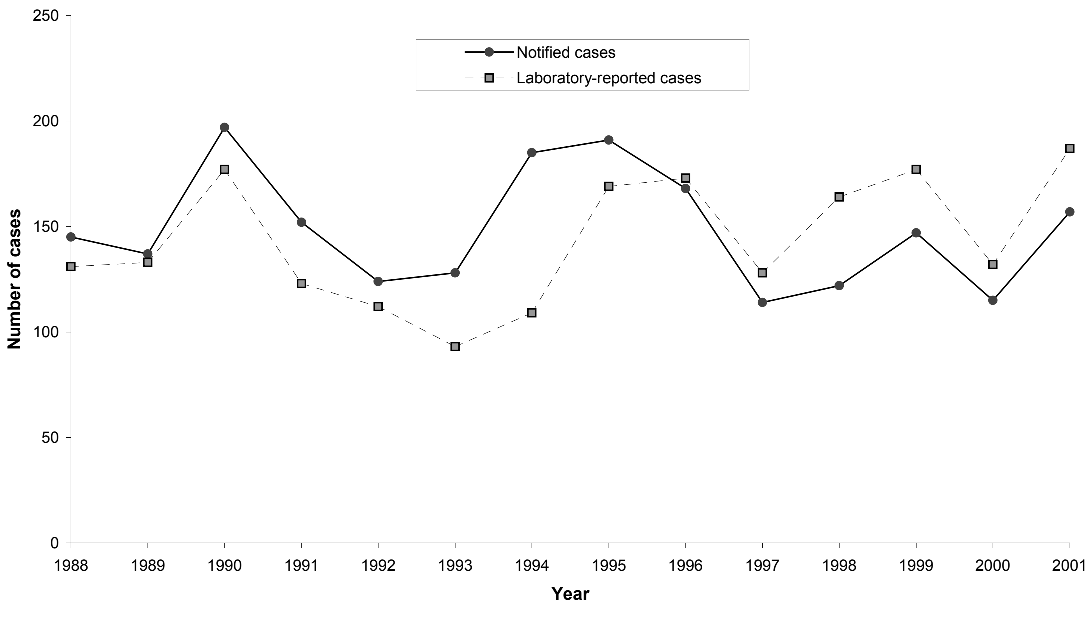
A total of 157 cases of shigellosis was notified in 2001. The 2001 notification rate of 4.2 per 100 000 was significantly (Chi-square, $p<0.05$) higher than the 2000 rate of 3.1. Of the 114 notified cases for whom hospitalisation status was recorded, 30 (26.3%) were hospitalised.

In comparison, the Enteric Reference Laboratory at ESR received 190 *Shigella* isolates during 2001. The predominant serogroups identified were *S.* Flexneri Biotype 2a (28.9 %), *S.* Sonnei Biotype a. (26.8%), and *S.* Sonnei Biotype g (21.6%).

A total of nine outbreaks of shigellosis were reported in 2001, from the combined Auckland health districts (seven outbreaks), Waikato (one), and Taranaki (one) health districts. Together they accounted for 61 cases.

The following graph shows the number of notified and laboratory-reported cases of shigellosis each year since 1988.

Shigellosis notified and laboratory-reported cases by year, 1988 - 2001



The rate of shigellosis varied throughout the country. Rates higher than the national average were recorded in Central Auckland (10.6 per 100 000), South Auckland (10.4), North West Auckland (5.6) and Canterbury (5.5) health districts.

The following table shows the distribution of shigellosis cases by age group and ethnicity. Gender was recorded for 150 (95.5%) of the 157 cases. Of these, 66 (44.0%) were male and 84 (56.0%) were female.

Shigellosis notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	0	0.0	1	7.1	0	0.0	1	26.9	1	3	5.5
1-4	5	4.1	1	1.9	10	52.2	7	49.9	5	28	13.0
5-9	1	0.6	3	4.5	14	59.3	4	21.8	4	26	9.1
10-14	1	0.6	2	3.2	4	18.5	1	5.0	3	11	3.8
15-19	0	0.0	0	0.0	1	5.5	0	0.0	1	2	0.8
20-29	9	2.9	3	3.6	4	11.8	1	2.3	0	17	3.5
30-39	14	3.5	0	0.0	2	6.3	2	4.4	7	25	4.3
40-49	6	1.5	0	0.0	2	9.2	0	0.0	3	11	2.0
50-59	8	2.4	0	0.0	2	15.0	1	5.1	2	13	3.1
60-69	7	3.0	0	0.0	2	26.8	0	0.0	1	10	3.5
70+	2	0.7	0	0.0	3	67.9	1	17.8	0	6	1.9
Unknown	0	-	0	-	0	-	0	-	5	5	-
Total	**53**	**2.0**	**10**	**1.9**	**44**	**22.0**	**18**	**7.3**	**32**	**157**	**4.2**

1 Crude rate per 100 000, based on 2001 Census

Overseas travel information was recorded for 109 of the 157 notified cases. Of these, 55 (50.5%) reported travelling overseas during the incubation period. Overseas destinations were Samoa (10), Bali, India (7 each), Fiji, Thailand (6 each), Nepal (5), Australia (3), Singapore, Vanuatu (2 each), Bangkok, Bolivia, Cambodia, Egypt, Indonesia, South Africa, and Tonga (1 each). The following table shows the rates of shigellosis among New Zealanders travelling overseas and the countries/regions visited.

Rates of shigellosis among New Zealanders travelling overseas and the countries/regions visited, 2001

Country / region	Cases	Travellers	Rate (per 100 000 visits)
Australia	3	682530	0.4
Oceania and Antarctica	19	127675	14.9
North Africa and the Middle East	1	5725	17.5
South-East Asia	17	69904	24.3
North-East Asia	1	80035	1.2
Southern and Central Asia	13	13108	99.2
Sub-Sahara Africa	1	8608	11.6
Total	**55**	987585	5.6

Of the 102 cases with no recorded history of overseas travel, 15 recorded contact with a confirmed case of the disease.

Streptococcal invasive disease

Reporting of streptococcal diseases, except for acute rheumatic fever, is not mandatory in New Zealand so surveillance depends on the voluntary referral of isolates to the Streptococcal Reference Laboratory at ESR. An isolate is not received from every disease case, so numbers under estimate the incidence of these diseases in New Zealand. Laboratory results give an indication of the distribution of organism types present.

Streptococcus pneumoniae

Serogrouping and serotyping of *Streptococcus pneumoniae* is undertaken to monitor the types causing invasive disease and the likely coverage by licensed or trial vaccines. In 2000 an audit of the major hospitals in New Zealand showed that referral of isolates from cases of invasive pneumococcal disease approximated 98% (except in Wellington) and thus the data accurately reflected the spectrum of serotypes encountered. It is likely the same applied in 2001. The 23-valent vaccine, used only for adult vaccinations, contains the following capsular antigen types: 1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F and 33. Among the pneumococci derived from cases over 14 years of age, 93.4% (299/320) belonged to serogroups/serotypes covered by the vaccine.

Conjugate vaccines developed for paediatric use deliver seven, nine or eleven capsular antigens. The seven-valent vaccine contains capsular types 4, 6B, 9V, 14, 18C, and 23F; the nine-valent vaccine additionally contains types 1 and 5; and the eleven-valent vaccine additionally contains types 3 and 7F. In 2001, invasive disease isolates were typed from 216 children under 15 years of age. By comparing the serotypes of the paediatric isolates against the three conjugate vaccines, seven-valent, nine-valent, and eleven-valent, it was predicted that 61.6 %, 65.7% and 71.3% respectively of paediatric disease may have been prevented by use of these vaccines.

In 2001 the prevalence of penicillin and cefotaxime resistance among isolates from invasive pneumococcal disease was 3.9% and 1.5%, respectively. A further 8.8% of isolates had intermediate penicillin resistance and 3.4% had cefotaxime intermediate resistance. Resistance to other antibiotics included 1.3% chloramphenicol resistance, 5.4% erythromycin resistance, 31.3% co-trimoxazole resistance, and 5.0% tetracycline resistance. All isolates were vancomycin susceptible.

Streptococcus pyogenes (Group A Streptococcus)

Of the isolates received in 2001, 120 were from cases of invasive disease. Seven isolates referred were identified as from cases of necrotising fasciitis. No one emm type predominated among these. Of the 8 isolates from scarlet fever, 4 were *emm*12. Three of four isolates from post-streptococcal acute glomerulonephritis were *emm*49, a recognised nephritogenic type. Thirty-six distinct M/*emm* types occurred among the invasive isolates, indicating the wide range of types which can cause significant infection in New Zealand. The most common M/*emm* types were 1, 3, 28, 81, and 91.

Streptococcus agalactiae (Group B Streptococcus)

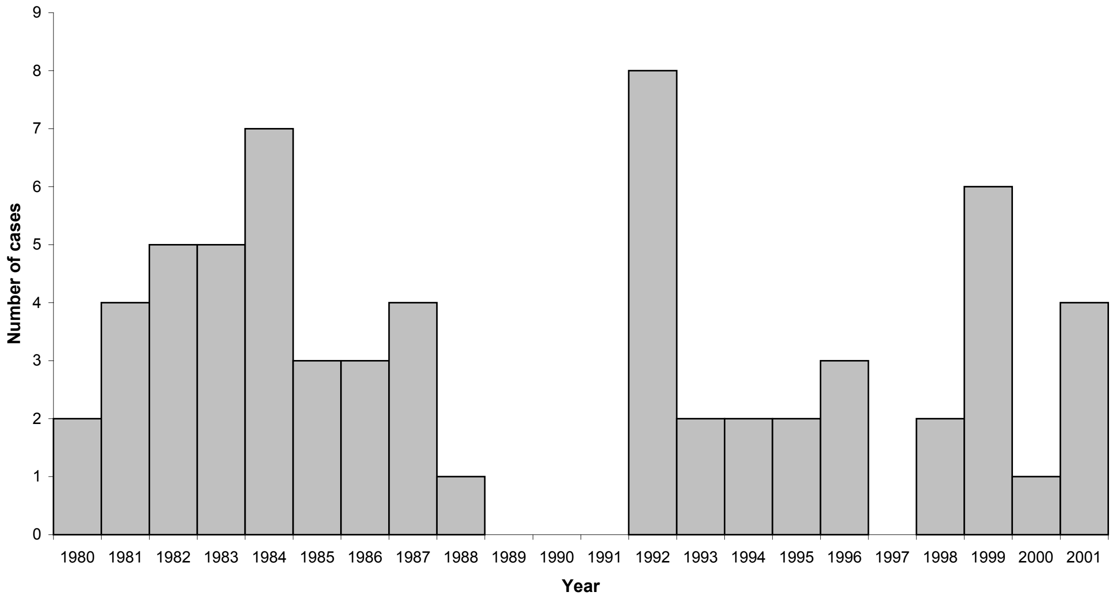
During 2001, isolates were received from 99 cases of invasive group B streptococcal disease. Twenty-five cases were from neonatal sepsis of which 16 were early onset disease. Serotype III continued to be the most common serotype involved in neonatal sepsis accounting for 60% (15/25).

Tetanus

Four cases of tetanus were notified in 2001 compared to one case in 2000 and six in 1999. All four cases were hospitalised and one death from tetanus was reported. The 2001 notified cases were one male aged 44 years and three females aged 1, 87, and 88 years. Information on occupational risk factors was recorded for three of the four cases. Only the 87 year-old case was exposed occupationally to the disease[1]. Of the three cases for whom immunisation status was recorded, none had been vaccinated against the disease.

The following graph shows tetanus notifications since 1980.

Tetanus notifications,
1980 - 2001



[1] *The exposure was due to gardening.*

Toxic Shellfish Poisoning

In January 2001, a case of toxic shellfish poisoning was notified from the West Coast Health District. The case, a 53-year old female Maori, shared a meal of raw and cooked feral mussels with a 50-year old male. Both experienced vomiting and diarrhoea for a period of several days. The shellfish was collected from an area of coastline, that had been closed a day later due to NSP contamination.

The only neurological symptom experienced by the case was a slight tremor. Biotoxin testing of leftover mussel recorded a NSP toxin level of 19.7 (which is below the regulatory limit of 20). This test is relatively non-specific and toxins other than NSP may have been implicated. Shellfish samples later taken from the closed area of coastline revealed high concentrations of other shellfish toxins.

One 'suspect' case of toxic shellfish poisoning was also notified from the Waikato Health District in October 2001. The case, a 21 year-old female Maori, experienced general neurological symptoms after eating fish and handling recreationally harvested kina. No testing for biotoxins or bacterial pathogens was carried out.

Trichinellosis

Two cases of trichinellosis were notified during 2001 from the Waikato Health District. These have been the only confirmed notifications of the disease since 1992, and the first notifications of endemic human trichinellosis in New Zealand.

The two cases, a European male farmer aged 27 years and a European female farmer aged 41 years, were both hospitalised with signs and symptoms consistent with trichinellosis, including myalgia, fever, periorbital oedema, and photophobia. Laboratory testing of both cases showed marked eosinophilia and negative serology for *Leptospira*. Muscle biopsies were not performed. Both cases had consumed wild pork from the same source, and leftover frozen meat was found on testing to contain cysts identified as *Trichinella spiralis* by pepsin digest testing and DNA sequencing. Results of serological testing performed on the two cases later confirmed the diagnosis.

Tuberculosis

A total of 381 cases of tuberculosis was notified in 2001, 26 of whom (6.8%) were reactivations. In comparison, 354 cases were notified last year, 30 of whom (8.8%) were reactivations.

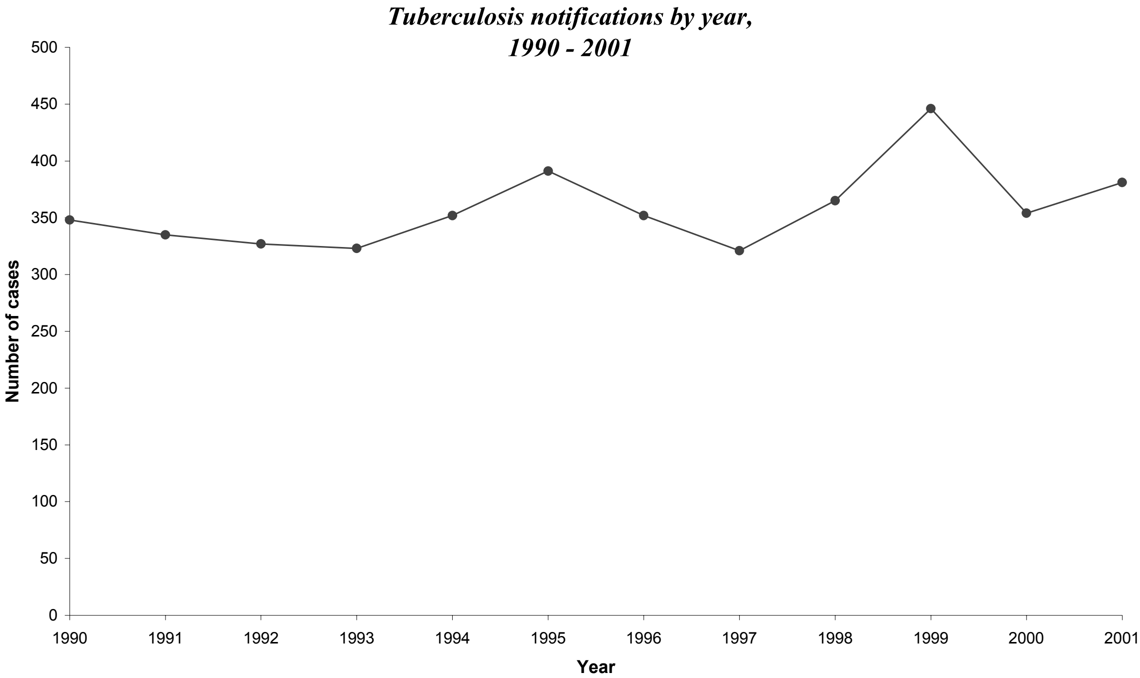
Of the 334 cases notified in 2001, for whom hospitalisation information was recorded, 213 (63.8%) were hospitalised. Two deaths as a result of the disease were also reported in 2001, compared to seven deaths in 2000.

Twelve cases were linked to five separate outbreaks of tuberculosis reported from Eastern Bay of Plenty, Hawkes Bay, Manawatu, and South Canterbury health districts.

The rates of tuberculosis varied throughout the country. Rates higher than the national average of 10.2 per 100 000 were recorded in Central Auckland (22.8 per 100 000), South Auckland (17.8), Taupo (15.9), Wellington (15.4), Eastern Bay of Plenty (14.3) and Hawkes Bay (12.5) health districts.

In 2001, 82.7% (315/381) of notified cases were laboratory confirmed, slightly more than the 80.0% confirmed in 2000.

The following graph shows the number of notified cases of tuberculosis each year since 1990.



Of the 381 cases of tuberculosis notified during 2001, two cases from the Auckland region were recorded as having AIDS. Four cases (one from Wellington and three from Auckland) were recorded as being co-infected with HIV. All six cases were recorded as having been born overseas: two in Thailand and one each in India, Congo, Cambodia, and Ethiopia. This information is based on that recorded on AIDS/ HIV infection database maintained by AIDS Epidemiology Group at Otago University.

The following table shows the distribution of tuberculosis cases by age group and ethnicity for 2001. Gender was recorded for all but two of the cases. Of these, 190 were male and 189 were female.

Tuberculosis notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	0	0.0	0	0.0	0	0.0	1	26.9	0	1	1.8
1-4	1	0.8	5	9.3	1	5.2	1	7.1	0	8	3.7
5-9	0	0.0	2	3.0	5	21.2	0	0.0	1	8	2.8
10-14	1	0.6	3	4.8	3	13.8	7	34.7	0	14	4.8
15-19	1	0.6	4	8.1	4	22.1	8	28.6	1	18	6.8
20-29	5	1.6	11	13.4	12	35.5	56	128.8	5	89	18.3
30-39	7	1.8	4	5.2	3	9.5	52	113.7	4	70	12.1
40-49	4	1.0	1	1.7	3	13.8	29	76.7	3	40	7.4
50-59	2	0.6	5	15.0	5	37.5	16	81.9	2	30	7.2
60-69	5	2.2	10	51.2	7	93.6	17	154.1	4	43	15.2
70+	27	9.4	7	72.3	5	113.1	13	231.7	6	58	18.0
Unknown	0	-	0	-	0	-	1	-	1	2	-
Total	**53**	2.0	**52**	9.9	**48**	24.0	**201**	81.2	**27**	**381**	10.2

[1] Crude rate per 100 000, based on 2001 Census

In comparison, the incidence rates (per 100 000) in 2000 for each ethnicity were 1.7 for European, 13.8 for Maori, 36.4 for Pacific people and 91.8 for those of 'Other' ethnicity.

Information on country of birth was provided for 335 cases in 2001. Of these, 31.3 % (105/335) were recorded as having been born in New Zealand. The remaining 68.7% (230/335) were born overseas. In comparison, 62.3% of cases notified in 2000 (197 of the 316 cases for which the information was recorded) were born overseas.

A total of 60.0% of overseas born cases notified during 2001 (114 of the 191 cases for which arrival date was recorded), developed tuberculosis within the first year of arriving in New Zealand. A further 34% developed tuberculosis between one and five years of arriving in New Zealand.

Information on how tuberculosis cases were discovered during 2001 was provided for 329 (86.4%) cases. Of these, 227 saw a practitioner with symptoms, 37 were detected through contact follow-up and 30 through refugee or immigrant screening. The remaining 35 cases were discovered via other means.

Based on data from the Mycobacteriology Reference Laboratories, the causative organism was isolated and identified from 289 (of the 381 cases notified during 2001[1]). There were 283 *Mycobacterium tuberculosis* isolates and 6 *M. bovis* isolates.

[1] *It is emphasised that the discussion of antimicrobial susceptibility of tuberculosis isolates which follows is based only on the testing of isolates corresponding to cases notified during 2001. Therefore, quoted figures do not necessarily tally with those obtained from analysis of all isolates tested during 2001.*

The antimicrobial susceptibility of all isolates was tested. No isolates were multidrug resistant (defined as resistant to at least isoniazid and rifampicin)[1]. The overall resistance[2] to isoniazid, rifampicin, ethambutol, pyrazinamide and streptomycin was 6.2%, 0.35%, 0.69%, 2.8%, and 6.6% respectively. There was a small apparent decrease in the prevalence of resistance in 2001, with 13.8% of isolates (40) being resistant to at least one antimicrobial compared with 16.9% in 2000.

Resistance patterns of tuberculosis isolates for cases notified in 2001

	Number (%)	**Resistance pattern[1]**	**Number (%) with each pattern**
Fully sensitive	249 (86.2)		
Resistant to 1 agent	33 (11.4)	H Z S E	12 (4.2) 7 (2.4)[2] 13 (4.5) 1 (0.35)
Resistant to 2 agents	6 (2.1)	HS RE	5 (1.7) 1 (0.35)
Resistant to 3 agents	1 (0.35)	HZS	1 (0.35)

[1] H, isoniazid; R, rifampicin; Z, pyrazinamide; S, streptomycin; E, ethambutol
[2] includes all six *M. bovis* isolates

Information on the country of birth was provided for 34 of the 40 isolates resistant to at least one antimicrobial. Of these, 31 (91.2%) were born overseas.

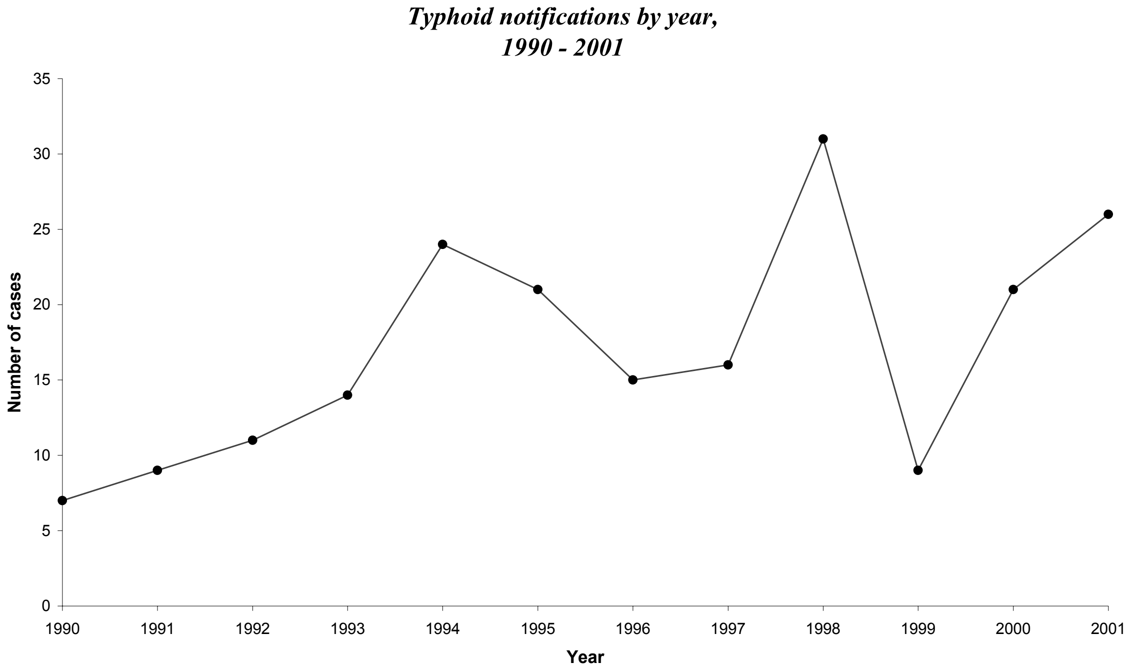
Twenty-one of the total 289 isolates corresponding to cases notified in 2001 were from cases categorised as TB reactivations. All were *M. tuberculosis* and 86% (18) were fully susceptible to the five antimicrobials tested. Of the remaining three isolates, one was resistant to ethambutol, one was resistant to isoniazid, and another to pyrazinamide.

Typhoid

Twenty-six cases of typhoid were notified in 2001. The Enteric Reference Laboratory at ESR received 26 *Salmonella* Typhi isolates. One *Salmonella* Typhi isolate could not be matched to a notification and one notification had no corresponding laboratory isolate. The 2001 rate of 0.7 per 100 000 was slightly higher than the 2000 rate of 0.6 per 100 000. Hospitalisation status was recorded for all 26 cases, of which 21 (80.8%) were hospitalised.

[1] Since data collation began in 1995, all multidrug resistant isolates have been from persons born outside New Zealand.
[2] Includes resistance alone or in combination with other antimicrobials.

The following graph shows typhoid notifications by year since 1990.



The majority of cases (17/26) were in the 15 and over age group. Ten cases (38.5%) were male and 16 (61.5%) were female.

Overseas travel information was recorded for all 26 cases. Of these, seventeen (65.4%) were recorded as having travelled overseas during the incubation period for the disease. The countries visited were Samoa (seven cases), India (five), Indonesia (two), Bangladesh, China, and Malaysia (one each). The following table shows the rates of typhoid among New Zealanders travelling overseas and the countries/regions visited.

Rates of typhoid among New Zealanders travelling overseas and the countries/regions visited, 2001

Country / region	**Cases**	**Travellers**	**Rate (per 100 000 visits)**
Oceania and Antarctica	7	127675	5.5
South East Asia	3	69904	4.3
North East Asia	1	80035	1.2
Southern and Central Asia	6	13108	45.8
Total	**17**	290722	5.8

Of the nine cases who recorded no history of overseas travel, three cases recorded contact with a confirmed case of the disease.

Verotoxigenic or Shiga toxin producing *Escherichia coli* (VTEC/STEC) infection

There were 76 cases of VTEC/STEC infection notified in 2001. This is the highest annual number of notifications to date. The 2001 rate of 2.0 per 100 000 was slightly higher than the 2000 rate of 1.8. Hospitalisation status was recorded for 74 cases in 2001, of whom 16 (21.6%) were hospitalised.

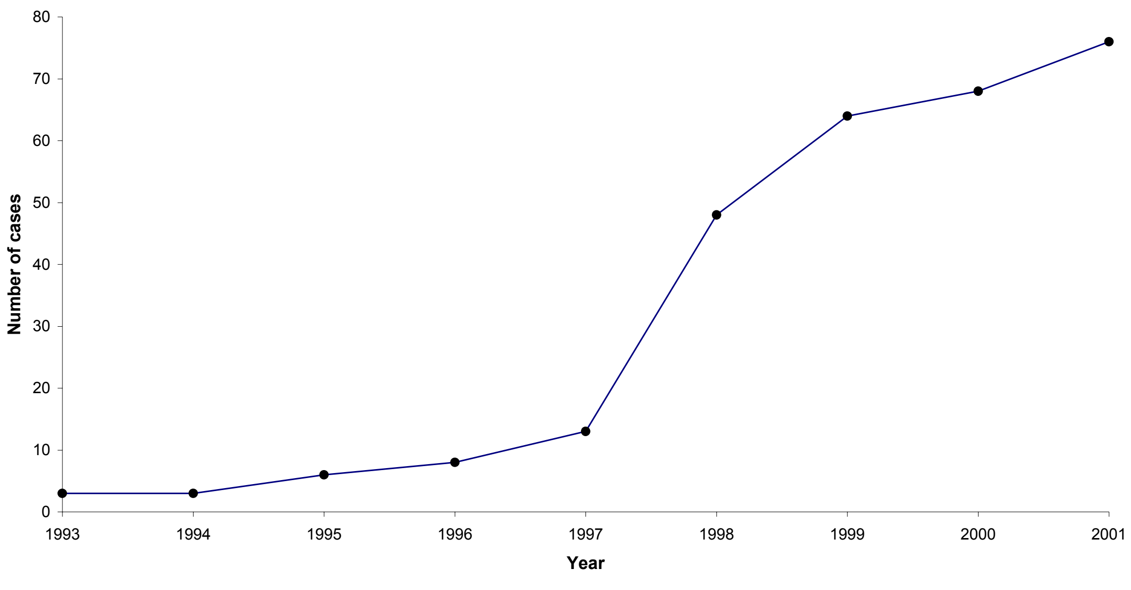
A total of four outbreaks of *Escherichia coli* O157 were reported in 2001, from North West Auckland (2 outbreaks), Gisborne and Nelson Marlborough health districts (one each). Together they accounted for 10 cases.

In 2001, the Enteric Reference Laboratory at ESR received a total of 75 VTEC/STEC isolates. Seventy-three cases were identified as serotype O157 and two cases as other serotypes. Matching of notified and ESR laboratory-confirmed cases indicated that 69 cases were both notified and laboratory-confirmed. (Seven notified cases could not be matched to a laboratory isolate and six laboratory isolates had no corresponding notification).

Six cases of VTEC/STEC-associated haemolytic uraemic syndrome (HUS) were notified in 2001 to the New Zealand Paediatric Surveillance Unit (NZPSU), five of whom were also notified.

The following graph shows VTEC/STEC infection notifications each year since 1993.

Notified cases of VTEC / STEC infection by year, 1993 - 2001



The rate of VTEC/STEC infection varied throughout the country. Rates higher than the national average were recorded in Waikato (7.1 per 100 000), Ruapehu (7.0), Gisborne (6.8), Eastern Bay of Plenty (6.1), Tauranga (5.4), Otago (4.8), Southland (4.6), Rotorua (3.1) and Hawkes Bay (2.1) health districts.

The following table shows the distribution of VTEC/STEC cases by age group and ethnicity. Gender was recorded for all 76 cases. Of these, 36 (47.4%) were male and 40 (52.6%) were female. Age was also recorded for all 76 cases. The highest age-specific rate of VTEC/STEC infection occurred among children aged less than one year of age, with a rate of 22.0 per 100000. The VTEC/STEC rate among this age group is higher than in 2000 (11.0). The number and proportion of cases occurring among children aged less than five are higher in 2001 (49, 65.5%) than in 2000 (38, 55.9%).

VTEC/STEC infection notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	8	26.9	2	14.3	0	0.0	0	0.0	2	12	22.0
1-4	28	23.0	1	1.9	1	5.2	2	14.3	5	37	17.1
5-9	6	3.6	0	0.0	0	0.0	0	0.0	2	8	2.8
10-14	1	0.6	1	1.6	0	0.0	0	0.0	1	3	1.0
15-19	1	0.6	0	0.0	0	0.0	0	0.0	0	1	0.4
20-29	3	1.0	0	0.0	0	0.0	0	0.0	0	3	0.6
30-39	1	0.3	0	0.0	0	0.0	0	0.0	2	3	0.5
40-49	2	0.5	0	0.0	0	0.0	0	0.0	0	2	0.4
50-59	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0.0
60-69	1	0.4	0	0.0	0	0.0	0	0.0	1	2	0.7
70+	5	1.7	0	0.0	0	0.0	0	0.0	0	5	1.6
Unknown	0	-	0	-	0	-	0	-	0	0	-
Total	**56**	**2.1**	**4**	**0.8**	**1**	**0.5**	**2**	**0.8**	**13**	**76**	**2.0**

1 Crude rate per 100 000, based on 2001 Census

The following table summarises the risk factor information recorded for notified cases of VTEC/STEC in 2001. The results must be interpreted with caution as a number of the risk factors identified are common aspects of many New Zealanders' daily lives, and the proportions quoted may be solely a reflection of the frequency with which these activities occur in the overall population. The majority of cases (70/76) had a least one risk factor recorded. Risk factor information for the remaining six cases was unknown. Four children under 5 years old had high-risk exposures, i.e. consumption of raw milk or consumption of pink or undercooked meat.

Risk Factor[2]	Yes	No	Unk	Proportion[1]
Consumption of:				
-Raw milk	5	49	22	9.3%
-Dairy products	44	9	23	83.0%
-Beef	42	10	24	80.8%
-Lamb	10	36	30	21.7%
-Poultry	30	17	29	63.8%
-Processed meats	29	21	26	58.0%
-Home kill meat	8	46	22	14.8%
-Pink/undercooked meat	5	46	25	9.8%
-Raw fruit/vegetables	34	12	30	73.9%
-Fruit/vegetable juice	16	28	32	36.4%
Non-habitual water supply	9	34	33	20.9%
Recreational contact with water	11	47	18	19.0%
Animal contact	54	9	13	85.7%
Contact with children in nappies	24	30	22	44.4%
Contact with person with similar symptoms	19	32	25	37.3%
Overseas travel	4	55	17	6.8%
Contact with sewage	2	52	22	3.7%
Contact with raw meat/offal	1	0	75	100.0%

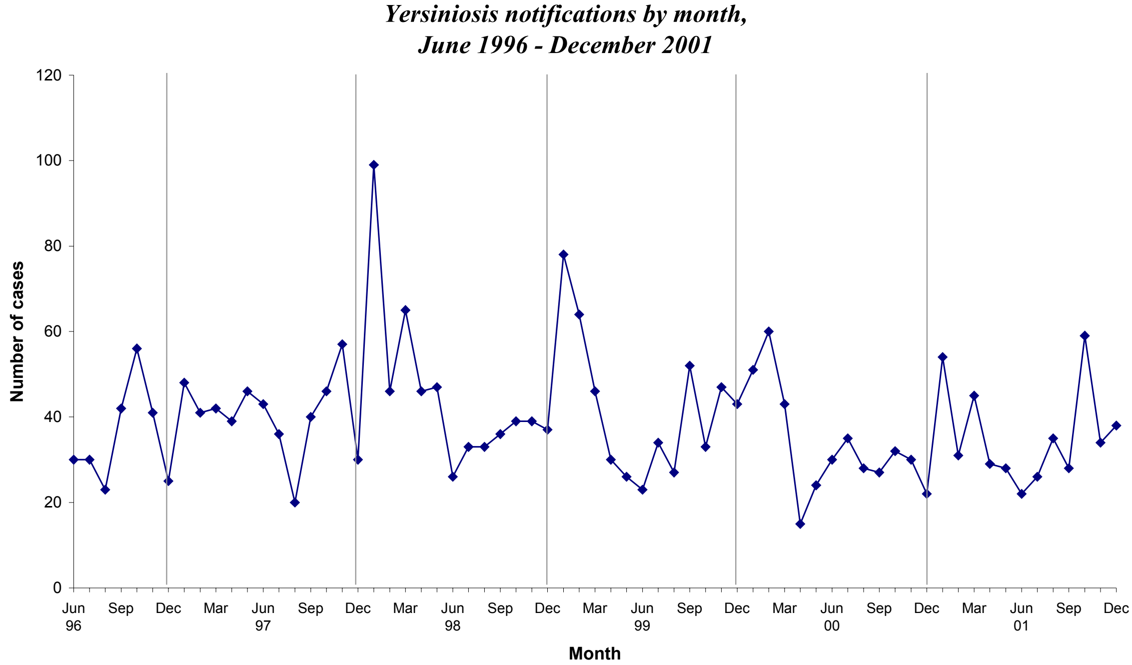
1 "Proportion" refers to the percentage of cases who answered "yes" out of the total number of cases where this information was known
2 Some cases had more than one risk factor recorded.

Yersiniosis

A total of 429 cases of yersiniosis was notified in 2001. The 2001 rate of 11.5 per 100 000 is similar to the 2000 rate of 10.6. Of the 279 cases for whom hospitalisation status was recorded, 17 (6.1%) were hospitalised.

A total of three outbreaks of yersiniosis were reported in 2001, from Central Auckland, Wanganui, and Nelson Marlborough health districts. Together they accounted for 10 cases.

The following graph shows the number of notified cases of yersiniosis by year since the disease became notifiable in June 1996.



The rate of yersiniosis varied throughout the country in 2001. Rates higher than the national average were recorded in Gisborne (22.8 per 100 000), South Canterbury (20.5), Tauranga (20.1), Taupo (19.0), Eastern Bay of Plenty (16.3), Waikato (15.9), Central Auckland (13.6), West Coast (13.2), Hutt (12.9), Southland (12.0), and Wanganui (12.0) health districts.

The following table shows the distribution of yersiniosis cases by age group and ethnicity. Gender was recorded for 420 (97.9%) of the 429 cases. Of these, 217cases (51.7%) were male and 203 (48.3%) were female.

Yersiniosis notifications by age group and ethnicity, 2001

Age group (years)	European		Maori		Pacific people		Other		Unknown	Total	
	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Rate[1]	Cases	Cases	Rate[1]
<1	16	53.8	3	21.4	1	19.4	11	295.9	10	41	75.0
1-4	40	32.9	7	13.1	1	5.2	11	78.4	28	87	40.2
5-9	13	7.7	1	1.5	0	0.0	1	5.4	8	23	8.0
10-14	11	6.2	1	1.6	0	0.0	3	14.9	5	20	6.9
15-19	5	3.1	0	0.0	0	0.0	0	0.0	1	6	2.3
20-29	22	7.2	5	6.1	0	0.0	4	9.2	10	41	8.4
30-39	37	9.3	4	5.2	1	3.2	3	6.6	10	55	9.5
40-49	40	10.1	2	3.4	1	4.6	3	7.9	16	62	11.5
50-59	28	8.4	1	3.0	1	7.5	3	15.4	7	40	9.6
60-69	23	9.9	0	0.0	0	0.0	1	9.1	5	29	10.3
70+	20	7.0	1	10.3	1	22.6	0	0.0	1	23	7.1
Unknown	0	-	0	-	0	-	1	-	1	2	-
Total	**255**	**9.8**	**25**	**4.7**	**6**	**3.0**	**41**	**16.6**	**102**	**429**	**11.5**

1 Crude rate per 100 000, based on 2001 Census

Overseas travel information was recorded for 240 cases. Of these, 13 (5.4%) were recorded as having travelled overseas during the incubation period for the disease. Overseas destinations were: China, Malaysia (two cases each), Cook Islands, Croatia, Germany, Namibia, Northern Island, United Kingdom, USA (one case each). A further four cases indicated prior travel that might account for the infection.

Of those cases for whom the information was recorded, 39.9% (83 /208) reported contact with farm animals, 7.5% (13/174) with other sick animals, and 11.7% (23/197) contact with other symptomatic cases, during the incubation period for the disease.

For forty cases, the implicated source of infection was contaminated food or drink.

Fatal cases of notifiable diseases, 2001

Disease	Number of Fatal cases	Total number of cases	Case-fatality rate
AIDS	9	26	34.6%
Campylobacter	1	10148	0.0%
Creutzfeldt Jakob disease	1	1	100.0%
Hepatitis B	1	57	1.8%
Legionellosis	2	46	4.3%
Listeriosis[1]	2	18	11.1%
Meningococcal disease	26	650	4.0%
Salmonellosis	2	2417	0.1%
Tetanus	1	4	25.0%
Tuberculosis disease	2	381	0.5%
Total	**47**	**-**	**-**

1 There was one fatality from perinatal listeriosis and one from non-perinatal listeriosis.

Hospitalised cases of notifiable diseases, 2001

Disease	Number of hospitalised cases	Total number of cases[1]	Hospitalisation rate
Campylobacteriosis	393	6356	6.2%
Cryptosporidiosis	40	964	4.1%
Dengue fever	21	84	25.0%
Gastro-enteritis	29	766	3.8%
Giardiasis	15	1120	1.3%
Haemophilus influenzae type b	10	10	100.0%
Hepatitis A	12	61	19.7%
Hepatitis B	15	46	32.6%
Hepatitis C	2	35	5.7%
Hydatid disease	4	6	66.7%
Lead absorption	6	101	5.9%
Legionellosis	31	42	73.8%
Leptospirosis	45	82	54.9%
Listeriosis	17	18	94.4%
Malaria	26	53	49.1%
Measles	7	66	10.6%
Meningococcal disease	619	632	97.9%
Mumps	2	53	3.8%
Paratyphoid	7	30	23.3%
Pertussis	92	1236	7.4%
Rheumatic fever	41	44	93.2%
Rickettsial disease	3	3	100.0%
Rubella	0	24	0.0%
Salmonellosis	279	1934	14.4%
Shigellosis	30	114	26.3%
Tetanus	4	4	100.0%
Tuberculosis	213	334	63.8%
Typhoid	21	26	80.8%
VTEC/STEC infection	16	74	21.6%
Yersiniosis	17	279	6.1%
TOTAL	**1398**	**13965**	**10.0%**

1 Number of cases where hospitalisation status was provided

Incidence rates for notifiable diseases in New Zealand 2001, compared with other developed countries

Incidence rates for notifiable diseases in New Zealand 2001 compared with other developed countries.

	Country					
Disease	**New Zealand (2001)**	**Australia[a,b] (2001)[c]**	**USA[d,e] (1999)**	**Canada[f,g] (1999)**	**England and Wales[h,i] (2001)**	**Scotland[j,k] (2001)[l]**
AIDS[c]	0.7	1.2	16.0	1.4	-	-
Campylobacteriosis	271.5	77.4	-	38.3	-	-
Cholera	0.1	0	0	0	0.1	0.1
Cryptosporidiosis	32.3	8.6	0.8	-	-	-
Dengue fever	2.5	1.0	-	-	-	-
Giardiasis	42.9	-	-	17.4	-	-
H. influenzae type b disease	0.4	0.2	0.5	0.1	0.1	-
Hepatitis A	1.6	2.9	6.1	3.0	2.3	-
Hepatitis B	1.5	2.2	2.7	4.3	2.1	-
Hepatitis C	1.6	3.0	1.1	64.6	2.1	-
Legionellosis	1.2	1.5	0.4	0.3	-	0.3
Leptospirosis	2.8	1.4	-	-	0.1	-
Listeriosis	0.5	0.3	-	0.2	-	-
Malaria	1.4	3.8	0.6	1.2	2.2	0.6
Measles	2.2	0.7	0	0.1	4.6	6.5
Meningococcal disease	17.4	3.5	0.9	0.7	2.0	5.0
Mumps	1.5	0.6	0.1	0.3	5.6	3.0
Paratyphoid	0.9	-	-	0.1	0.3	-
Pertussis	35.7	51.2	2.6	20.3	1.8	2.0
Ross River virus infection	0.1	18.7	-	-	-	-
Rubella	0.8	1.5	0.1	0.1	3.0	4.8
Salmonellosis	64.7	35.7	14.4	18.7	-	-
Shigellosis	4.2	3.0	6.2	3.6	-	-
Tetanus	0.1	0	0	0	0	-
Tuberculosis	10.2	5.1	6.2	6.0	13.7	-
Typhoid	0.7	0.5	0.1	0.2	0.2	-
VTEC/STEC infection	2.0	0.1	1.6	5.0	-	-

-: Disease not notifiable or information not available.

a: (Australian) National Centre for Disease Control / Communicable Diseases Network Australia Communicable Diseases and Environmental Health Branch, Australian Department of Health and Ageing. Web: http://www.health.gov.au/pubhlth/cdi/nndss/nndss2.htm

b: Population figure (17 892 423) 1996 census. Australian Bureau of Statistics, "AusStats: 0 Australia Basic Community Profiles, B01 Selected Characteristics All Persons". Web: http://www.abs.gov.au/

c: Australian Aids data (only) is for the calendar year 2000 and is from the (Australian) National Centre in HIV Epidemiology and Clinical Research reported by the (Australian) Communicable Diseases Network.

d: Centers for Disease Control and Prevention (CDC). Summary of notifiable diseases, United States, 1999. MMWR 1999: 48 (No.53): 13.

e: Population figure (281 421 906) census 2000. United States Census Bureau. Web: http://www.census.gov.main/www/cen2000.html

f: Health Canada. Canada Communicable Disease Report Volume 2756 November 2001 "Notifiable Diseases Annual Summary 1999" (published report).

g: Population figure (30 007 094) census 2001 Statistics Canada. Web: http://www.statcan.ca/Daily/English/020312/td020312.htm

h: NOIDS Provisional Report; Statutory Notifications of Infectious Diseases in England and Wales. Year 2001 Data.

i: Population figure (49 890 277) census 1991, National Statistics (UK) dataset "NMGBTD National Monitor for Great Britain – Resident Population" . Web: http://www.statistics.gov.uk/statbase/

j: Scottish Centre for Infection and Environmental Health (SCIEH). SCIEH Weekly Report Volume 36 2002:/01 8 January 2002 page 4 (provisional data).

k: Population figure (4 998 567) census 1991, National Statistics (UK) details above.

l: Three days missed from the year.

Note that data presented as international comparisons should be interpreted with caution due to differences in the surveillance systems from which the figures are obtained. Differences in data collection methods (e.g. through laboratory diagnosis and/or doctor notification) and data collected according to different case definitions (especially those diseases involving both acute and chronic cases such as hepatitis C), will result in rates of disease that are not necessarily comparable. Comparisons are likely to be more robust for more serious diseases, which are often under intensified forms of surveillance

Outbreak surveillance: a summary of outbreaks occurring in 2001 and reported to ESR

A detailed analysis of the outbreak surveillance data can be found in the Annual Summary of Outbreaks 2001.[21] A total of 389 outbreaks were reported to ESR in 2001, with a national rate of 10.4 outbreaks per 100 000 population. The outbreaks involved a total of 2323 cases, 1049 confirmed (according to the case definition reported for the outbreak) and 1274 probable cases. The average number of cases per outbreak for 2001 was 6.0. The number of outbreaks and number of cases reported during 2001 exceeded those of 2000, when 289 outbreaks were reported and involved 2296 cases.

Of the 389 outbreaks reported during 2001, 16 involved cases that were hospitalised, with 78 cases hospitalised in total. There were two recorded deaths among outbreak associated cases, both due to meningococcal disease.

The most frequently-reported type of outbreak was common source outbreaks (227, 58.4%) followed by outbreaks in defined settings (137, 35.2%) and community-wide outbreaks (8, 2.1%). The number of reported outbreaks occurring within households doubled from 52 in 2000 to 104 in 2001.

Outbreaks were reported from 22 of the 24 health districts. Auckland health districts reported the highest number (213 outbreaks involving 997 cases), followed by Manawatu with 22 outbreaks (106 cases), Hawkes' Bay 18 outbreaks (182 cases), Wellington 17 outbreaks (103 cases), and Canterbury 17 cases (218 cases) (*Table 1*). Outbreak rates exceeding the national average (10.4 outbreaks per 100 000 population) were reported from West Coast (39.6), Wanganui (20.6), Auckland (18.2), Gisborne (15.9), Manawatu (14.9), Rotorua (14.0), Taupo (12.7) and Hawkes Bay (12.5) health districts.

Table 1. Number of outbreaks by health district, January – December 2001

Health District[1]	No of outbreaks	Percent (n=389)	Outbreak rate (per 100,000 population[2])
Northland	4	1.0	2.9
Auckland[3]	213	54.8	18.2
Waikato	12	3.1	3.9
Eastern Bay of Plenty	2	0.5	4.1
Rotorua	9	2.3	14.0
Taupo	4	1.0	12.7
Tauranga	4	1.0	3.1
Gisborne	7	1.8	15.9
Hawkes Bay	18	4.6	12.5
Taranaki	5	1.3	4.8
Manawatu	22	5.7	14.9
Ruapehu	0	0.0	0.0
Wanganui	12	3.1	20.6
Wairarapa	1	0.3	2.6
Wellington	17	4.4	6.7
Hutt	4	1.0	3.0
Nelson-Marlborough	12	3.1	9.8
Canterbury	17	4.4	4.2
South Canterbury	5	1.3	6.4
West Coast	12	3.1	39.6
Otago	9	2.3	5.4
Southland	0	0.0	0.0
Total	**389**	**100.0**	**10.4**

1 Where no health district was indicated on the reporting form, health district was assigned according to the PHS where the outbreak was entered on to the surveillance system
2 Based on 2001 census
3 Includes North West Auckland, Central Auckland and South Auckland Health Districts

Enteric pathogens were identified or suspected in 369 (94.9%) outbreaks. The most commonly implicated pathogen or toxin was Campylobacter (56 outbreaks, 14.4%) followed by Norwalk-like virus (NLV) (45 outbreaks, 11.6%) and Salmonella (37, 9.5%) (*Table 2*).

Table 2. Number of outbreaks and cases by suspected pathogen or toxin, January – December 2001

Suspected pathogen or toxin	No. of outbreaks[1]	Percent (n=389)	No. of cases[2]	Percent (n=2323)	Average no. of cases
Enteric	**369**	94.9	**2095**	90.2	5.7
Gastroenteritis (agent not specified)	126	32.4	564	24.3	4.5
Campylobacter	56	14.4	301	13.0	5.4
NLV	45	11.6	541	23.3	12.0
Salmonella	37	9.5	214	9.2	5.8
Cryptosporidium	27	6.9	147	6.3	5.4
Giardia	18	4.6	75	3.2	4.2
Clostridium perfringens	15	3.9	59	2.5	3.9
Staphylococcus aureus	11	2.8	23	1.0	2.1
Shigella	9	2.3	61	2.6	6.8
Bacillus cereus	6	1.5	21	0.9	3.5
Hepatitis A	3	0.8	11	0.5	3.7
Escherichia coli O157	4	1.0	10	0.4	2.5
Histamine poisoning	3	0.8	7	0.3	2.3
Yersinia	3	0.8	10	0.4	3.3
Rotavirus	3	0.8	41	1.8	13.7
Ciguatera poisoning	2	0.5	8	0.3	4.0
Toxic shellfish poisoning	1	0.3	2	0.1	2.0
Non Enteric	**25**	**6.4**	**211**	9.1	8.4
Bordetella pertussis	5	1.3	17	0.7	3.4
Mycobacterium tuberculosis	5	1.3	14	0.6	2.8
Neisseria meningitidis	4	1.0	11	0.5	2.8
Lead absorption	3	0.8	8	0.3	2.7
Measles	2	0.5	6	0.3	3.0
Legionella spp.	2	0.5	4	0.2	2.0
Hepatitis C	1	0.3	3	0.1	3.0
MSG poisoning	1	0.3	2	0.1	2.0
Dengue[3]	1	0.3	-		
Cannabis oil	1	0.3	16	0.7	16.0
Flu-like illness	1	0.3	147	6.3	147.0

1 More than one pathogen was reported for five outbreaks
2 Number of cases includes laboratory-confirmed, other confirmed and probable cases
One Dengue outbreak reported, but no cases were reported.

A specific food type was implicated in 134 of the 192 foodborne outbreaks. The most commonly implicated food type was mixed foods (33 outbreaks) followed by chicken (17 outbreaks). Methods used to identify foods implicated in foodborne outbreaks were case histories (123 outbreaks), environmental investigation (39), laboratory investigation (9), and epidemiologic investigation (5).

Most outbreaks were at least partly recognised by cases linked to a common source (216 outbreaks, 55.5%), attending a common event (165, 42.4%) and person to person contact with other case(s) (146, 37.5%). Person to person and zoonotic transmission accounted for 132 and 27 outbreaks respectively.

Commercial food operations were implicated in 168 outbreaks, 97 of which were restaurants or cafés. A total of 138 outbreaks were reported as having occurred in the home. Time/temperature abuse was the most common factor contributing to foodborne outbreaks (134/192 outbreaks). A specific food type was implicated in 134 of the 192 foodborne outbreaks. The most commonly implicated food type was mixed foods (33 outbreaks) followed by chicken (17 outbreaks). In only a small proportion of these outbreaks were the sources confirmed using epidemiological or laboratory methods.

Control measures were undertaken for 226 (58.1%) of the 2001 outbreaks. The most commonly reported intervention methods were health and education advice given to people working with the source (169 outbreaks) and modification of procedures (73).

Discussion

Important surveillance trends and events in 2001

The incidence of several important communicable diseases is increasing in New Zealand when compared to historical levels. In addition, our rates of a number of diseases are high when compared with other developed countries or failing to decline at an acceptable rate. The following disease events are of particular note:

Meningococcal disease: The meningococcal epidemic, which began in mid-1991, reached a new peak in 2001. A total of 650 cases was reported (with 26 deaths), giving a rate of 17.4 per 100 000 population. As previous years, rates were highest among the under 5 age group, and among Maori and Pacific people. The case fatality rate for 2001 was 4.0%, a similar rate to recent years. The case fatality rate for cases seen by a doctor prior to hospitalisation and given antibiotics was 2.2% compared to 7.5% for cases not seen by a doctor and not given antibiotics. Serogroup B disease continued to predominate during 2001 although an increase in serogroup C disease to 9.4% of the cases proportionately lowered serogroup B involvement to 88.4%. Meningococci with the PorA subtype P1.7b, 4 continued to cause most disease (80.5% of cases where the PorA subtype could be determined). This PorA subtype is the target antigen in the vaccine that will be used in trials in New Zealand aimed at limiting the epidemic.

Tuberculosis: The number of cases of tuberculosis increased in 2001 by 28 cases over 2000 reaching a total of 381 cases. This trend follows that of the last 13 years since the low of 295 cases in 1988. Cases arise from both local transmission (31.3%) and imported disease (68.7%). Continuing high rates of this preventable disease reinforce the need for control of tuberculosis to be given a high priority.

Acute Rheumatic Fever (ARF): The incidence of ARF remains high at 111 new cases in 2001. The rate of 3.1 per 100 000 is very high for a developed country and is failing to decline. Most cases are in Maori and Pacific people aged between 5 to 15 years. These individuals are at risk of developing chronic rheumatic heart disease. The number of recurrences of ARF has decreased from 12 in 2000 to three in 2001.

Pertussis: The pertussis epidemic that began in June 1999 became a national epidemic persisting through into 2001. During 2001 it resulted in 1335 notified cases and 92 hospitalisations. This rate of 35.7 per 100 000 was a significant (Chi-square, $p<0.001$) decline from the 2000 rate of 114.5 per 100 000. In New Zealand pertussis epidemics tend to occur every four to five years as the number of susceptibles in the population increase as a result of incomplete vaccination and waning vaccine immunity. Control of this disease depends on increasing vaccine coverage rates.

Other vaccine preventable diseases: Measles, mumps, and rubella incidence remained low in 2001. Based on a five to six year inter-epidemic period, the next measles epidemic may be expected to occur in 2002. *Haemophilus influenzae* type b (Hib) disease continues to decline following addition of Hib vaccine to the immunisation schedule in 1994. Hepatitis B incidence also continued its gradual decline following introduction of universal childhood vaccination in the 1980's.

Influenza: During the 2001 winter season, the overall influenza activity was low to moderate. The level of influenza-like illness was higher than in 2000, but lower than in 1999. In 2001, the national average weekly consultation rate was 62.8 per 100 000 patient population, compared with 32.5 per 100 000 patient population in 2000.

Influenza A (H1N1) was the predominant strain in June and July whereas in August and September, influenza B was predominant. Influenza A (H3N2) remained at a low level throughout the winter season.

During the period of May to September 2001, a total of 654 influenza isolates were analysed by five virology laboratories around the country. The majority of them were influenza A (424 isolates). Most influenza A (379) isolates were subtyped and 45 isolates were not subtyped. Influenza A (H1N1) was the predominant subtype (with 331 or 54% of total typed and subtyped isolates. Influenza B co-circulated with influenza A with 230 isolations (38% of total typed and subtyped isolates).

Enteric diseases: Enteric diseases notifications increased in 2001 to 17118, compared with 14160 in 2000, comprising 82% of all notifications (c.f. 69% in 2000). The proportion in 2001 is similar to the proportion in 1999 where enteric diseases comprised 81% of total notifications.

Campylobacteriosis remains the most frequently notified disease. New Zealand's rate 271.5 (per 100 000 population) is far higher than other developed countries.

Salmonellosis notifications in 2001 were the highest ever recorded, the dominant serotypes being *Salmonella* Typhimurium phage type 160 and *S.* Typhimurium phage type 135. A nationwide investigation of the increased number of *Salmonella* Typhimurium DT160 cases was conducted during 2001. A summary of this investigation is provided in this report, and full information is available in the final report[20].

VTEC/STEC notifications in 2001 were the highest on record, a matter for concern given the severe spectrum of illness associated with VTEC/STEC infection and its potential to cause large outbreaks[22]. This disease continues to occur as sporadic cases and small family clusters.

Cryptosporidiosis and Shigellosis increased significantly (Chi-square, $p<0.001$ and $p<0.5$ respectively) in 2001 with the number of cases of Cryptosporidiosis the highest yearly total ever recorded. Hepatitis A decreased significantly (Chi-square, $p<0.001$) in 2001 with the yearly total being the lowest number on record. Giardiasis showed a slight decrease in rate in 2001 and the rate of Yersiniosis was fairly stable.

Zoonoses: Leptospirosis remains New Zealand's most important zoonotic disease. The incidence in 2001 was slightly higher than in 2000. Most cases (88.4%) occurred in occupational groups having contact with farm animals or rodents (farmers, farm workers, meat workers, and forestry workers). This situation emphasises the importance of implementing controls to protect these occupational groups.

Vector borne diseases: The incidence of imported dengue fever rose sharply in 2001 with 93 notified cases. This is the highest yearly total on record with the majority of the cases reporting travel to Samoa. Notified cases of malaria dropped to 54 cases in 2001. Three cases of Ross River Infection were notified. The continuing arrival of infected and viraemic people raises the possibility that these arboviral diseases could become established here.

Rickettsial Disease: The presence of rickettsial disease in New Zealand was not confirmed until 2000, when testing of a DNA fragment from white cells collected from an Auckland case was found to have 100% homology with *R typhi*[23]. While only demonstrated with certainty in the Auckland region, it is likely that *R typhi*, the causative agent for murine typhus, is also present in other regions of New Zealand[24]. Rickettsial DNA from a rat trapped on the property of one of the cases suggests that rats may be the reservoir and rat fleas the vector for *R typhi*. Prevention of murine typhus is directed mainly at control of potential flea hosts, such as rats.

Diseases from contaminated environments: There were 46 cases of legionellosis notified in 2001, of note is the increasing proportion of cases caused by *Legionella longbeachae* (55.4%).

Travel-associated disease: Diseases associated with overseas travel or migration included those that are exotic to New Zealand such as cholera, dengue fever, leprosy, malaria and Ross River virus infection. Overseas travel was a major risk factor (greater than 44.4% of cases had this as a recorded risk factor) for hepatitis A, paratyphoid, shigellosis and typhoid.

HIV /AIDS: In 2001, 26 cases of AIDS were notified to the AIDS Epidemiology Group (similar to 2000). There were 95 new cases of HIV infection notified, a slight increase on the 88 cases in 2000. The predominant risk behaviour category for AIDS remains homosexual contact, thought this is relatively less important for new cases of HIV infection. In 2001, heterosexual contact was responsible for an increasing proportion of new AIDS notifications (54%) and new HIV infections (44%). Most (64%) of these new HIV infections have occurred overseas.

Sexually transmitted infections: New Zealand has high and increasing rates of the bacterial STIs, particularly chlamydia and gonorrhoea. Rates of gonorrhoea and chlamydia are higher than comparable countries such as Australia and Canada[25, 26, 27]. A full discussion of the STI surveillance data is contained in the annual surveillance report of STIs. The increase in chlamydia and gonorrhoea at sexual health clinics that occurred between 1996 and 2000 continued in 2001. Data from family planning clinics and student and youth health clinics show that chlamydia was the most common diagnosis. Additional laboratory-based surveillance is operating for chlamydia and gonorrhoea in Auckland and in the Waikato and Bay of Plenty, which show that rates of confirmed chlamydia are increasing.

Blood borne and tissue-borne infections: There were 60 cases of Hepatitis C notified in 2001 (c.f. 80 in 2000). The principal risk factor was a history of injecting drug use, reported by 66.7%. The data greatly underestimate the true incidence of HCV infection, as most new infections are asymptomatic. One case of Creutzfeldt-Jakob disease (CJD) was notified in 2001. The case did not have any features suggestive of new variant CJD.

Lead absorption: The number of notifications of lead absorption increased slightly in 2001 compared with 2000. Most (93.1%) were in adults aged 15 years or older. Lead absorption became notifiable at the new level of 15µg/dl in 1996, and since then notifications have increased each year except in 2000. The majority of this increase has occurred in adults and has been due to occupation or hobby related exposure to lead. It is not known whether the increasing rate is due to increased exposure to lead, or an increasing awareness of this condition amongst people who work with or who have hobbies that involve exposure to lead.

Outbreaks: There were 389 reported outbreaks in 2001, involving 2323 cases. This exceeds the number of outbreaks and cases for 2000 (289 outbreaks, 2296 cases). A total of 78 cases were hospitalised, and 2 deaths were recorded (meningococcal disease) for 2001. Enteric pathogens were identified or suspected in 369 (94.9%) of the 2001 outbreaks. The most commonly implicated pathogen or toxin was *Campylobacter* (56 outbreaks, 14.4%) followed by Norwalk-like virus (NLV) (45 outbreaks, 11.6%) and *Salmonella* (37, 9.5%). Household outbreaks had increased considerably from 2000 to 2001, suggesting either an increase in reporting of these outbreaks or an actual increase in the number of outbreaks in households. This finding emphasises the importance of work to reduce communicable disease in households, particularly by reducing overcrowding and improving food safety.

Investigation of outbreak often allows identification of risk factors and sources of illness that may not be apparent from analysis of reports collected from individual cases of disease. Of the 192 foodborne disease outbreaks reported during 2001, 134 were linked to a specific food type. The most commonly implicated individual food type was chicken, implicated in 17 foodborne outbreaks. This is likely to underestimate the contribution of chicken to foodborne outbreaks, as mixed dishes implicated in several other outbreaks also included chicken. Chicken or chicken products were also the most common foods implicated in foodborne *Campylobacter* outbreaks.

A further expansion on these figures, including the context for collection of outbreak surveillance data, can be found in the Annual Summary of Outbreaks 2001[21].

Limitations of data

Scope:

Many communicable diseases of public health importance are currently notifiable under the Health Act 1956 (which was amended in 1996 to include a number of new diseases). However, there are a number of important diseases and categories of communicable disease which are not notifiable. These include most sexually transmitted infections, pneumococcal disease, hospital acquired, and congenital infections. While some surveillance data on these diseases are available from other sources, these data remain incomplete. A more fundamental limitation of the scope of the notifiable disease surveillance system is that it is largely confined to communicable diseases (with the exception of lead absorption, decompression sickness, and chemical contamination of the environment).

Completeness of case ascertainment:
Notification data alone cannot provide the complete picture of disease burden. For some diseases many infected people will not visit a doctor or have the laboratory investigation needed to confirm a particular notifiable disease. There is also some under-notification of cases even after laboratory confirmation. The degree of case ascertainment is thought to be very high for diseases such as tuberculosis and meningococcal disease, which tend to be serious and where notification and laboratory surveillance data are combined. For some diseases, ESR receives both notification and laboratory data which provide a measure of the degree of under-notification (though not under-ascertainment, which cannot be measured without some more direct measure of disease incidence in the population). The notifiable disease surveillance system also tends to focus on acute infections and is less effective for surveillance of chronic infections, notably hepatitis B and C and HIV/AIDS, where initial infection is frequently asymptomatic.

Completeness of case data:
The notifiable disease surveillance system attempts to collect a range of information on each case, including demographic, risk factor, and management information. The level of completeness with which these data are obtained and recorded varies from very high for the more serious diseases, such as meningococcal disease, to relatively low for diseases such as campylobacteriosis, which tend to have only basic demographic information recorded.

Data errors:
There are unquantifiable errors in the data contained in this report. These errors are likely to be greater for rates than for simple counts of cases, as rates depend on both an accurate numerator, and an accurate and appropriate denominator. This potential source of error is most apparent in ethnicity-specific rates, where there are likely to be errors in the recorded ethnicity for both the cases and the census population, and in the appropriateness of combining these data items for rate calculation. Data errors can also result from inaccurate data entry or incorrect information supplied by the person notifying the case.

Improvements to surveillance

A number of changes have been scheduled for the surveillance system to improve both surveillance data quality and integration for the near future including:
- Routine integration of EpiSurv notification data with ESR laboratory data sources.
- Regular integration of ESR disease data with external data sources.
- A regular consolidated report to be provided by ESR to PHUs on infection diseases in their respective area that have been identified by ESR laboratories along with identified data gaps and inconsistencies.
- That PHUs be encouraged to record NHI numbers for all notified cases.
- The development of an EpiSurv quality assurance and performance measurement programme.

Appendix 1: Table of disease by year since 1980

DISEASE[3]	Surveillance Source	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
AIDS	Notification				0	3	11	19	28	38	59	73	78	50	70	44	50	76	43	29	33	27	26
Campylobacteriosis	Notification	271	442	769	1251	1915	2390	2786	2921	2796	4187	3850	4148	5144	8101	7714	7443	7635	8925	11575	8161	8421	10148
Cholera	Notification	1	0	0	0	0	0	0	2	0	0	5	0	0	0	2	2	0	0	1	1	0	3
Creutzfeldt-Jakob disease[1]	Notification																	2	1	0	2	3	1
Cryptosporidiosis[1]	Notification																	110	357	866	977	775	1207
Dengue fever	Notification	5	3	1	5	1	1	3	0	1	3	2	3	1	1	0	6	23	14	26	9	7	93
Gastroenteritis[1]	Notification																	447	308	490	600	726	938
Giardiasis[1, 2]	Notification																	897	2127	2183	1793	1686	1603
H. influenzae serotype b[1]	Notification								93	107	121	166	152	171	121	76	16	24	8	10	9	10	8
	Laboratory																	18	9	11	10	13	14
Hepatitis A	Notification	1649	1145	750	674	539	380	251	158	176	134	150	224	288	257	179	338	311	347	145	119	107	61
Hepatitis B	Notification	393	377	477	571	609	530	488	474	370	309	242	227	221	145	133	125	104	138	88	94	79	57
Hepatitis C (non A or B)	Notification	5	3	7	20	29	31	17	18	20	13	11	25	89	91	79	88	59	92	102	96	80	60
Hydatid disease	Notification	7	7	11	9	6	4	5	2	2	0	4	0	4	4	1	5	3	2	2	8	3	7
Influenza	Laboratory	33	12	18	30	9	6	8	18	136	119	343	183	317	423	441	521	673	743	127	425	73	313
Legionellosis	Notification	5	3	9	25	48	87	95	91	62	17	20	14	11	24	66	33	36	63	43	51	61	46
	Laboratory											21	42	60	76	121	76	60	109	107	65	56	56
Leprosy	Notification	8	10	3	7	9	5	7	8	2	4	1	4	5	3	1	1	10	3	3	10	5	2
Leptospirosis	Notification	582	325	179	169	201	174	139	129	99	90	117	106	70	116	70	65	56	52	75	59	98	105
	Laboratory									192	182	229	176	218	234	168	183	140	84	117	76	114	113
Listeriosis	Notification	32	18	15	5	6	6	6	12	7	10	16	26	16	11	8	13	10	35	17	19	22	18
Malaria	Notification	65	39	41	43	48	44	31	22	25	27	32	39	29	58	34	41	107	65	73	46	111	54
Measles[1]	Notification																	52	1984	164	107	64	83
	Laboratory	8	7	1	4	11	145	135	26	5	5	7	355	53	4	4	15	25	1220	35	2	9	21
Meningococcal disease	Notification	26	25	15	38	34	107	190	179	83	49	53	71	153	202	208	394	473	613	440	505	480	650
Mumps[1]	Notification																	63	90	85	56	50	56
	Laboratory	7	5	22	2	0	61	132	28	5	105	26	23	10	25	245	66	20	14	8	5	2	22
Paratyphoid	Laboratory									23	13	30	22	13	23	30	24	20	25	19	17	23	33
Pertussis[1]	Notification																	594	284	153	1046	4140	1335
	Laboratory	2	5	159	64	3	13	107	40	5	16	89	219	79	44	11	69	414	42	29	301	1979	248
Rheumatic fever	Notification							12	215	153	148	90	97	70	81	98	88	110	95	65	71	136	111
Rubella[1]	Notification																	259	80	53	35	26	30
	Laboratory	134	44	12	62	155	120	30	50	95	114	168	81	27	244	104	1581	339	21	2	0	0	3
Salmonellosis	Notification	799	845	1261	995	1138	1234	1335	1140	1128	1860	1619	1244	1239	1340	1522	1334	1141	1177	2069	2077	1796	2417
Shigellosis	Notification	228	173	215	173	127	192	189	143	145	137	197	152	124	128	185	191	167	117	122	147	115	157
Tetanus	Notification	2	4	5	5	7	3	3	4	1	0	0	0	8	2	2	2	3	0	2	6	1	4
Tuberculosis	Notification	474	448	437	415	404	359	320	296	295	303	348	335	327	323	352	391	352	321	365	446	354	381
Typhoid	Notification	15	12	11	5	2	6	28	4	15	17	7	9	11	14	24	21	15	16	31	9	21	26
VTEC/STEC infection	Notification														3	3	2	7	12	48	64	67	76
Yersiniosis[1]	Notification																	247	488	546	503	396	429

[1] Disease became notifiable from 1 June 1996 (1996 notification totals are for the June to December period only).
[2] Cases of gastroenteritis from a common source of foodborne intoxication eg. staphylococcal infection
[3] Table is based on EpiSurv notification data as at 19/3/2002

Appendix 2: Table of disease by health districts and rate, 2001

Disease	Northland	NW Auck	Central Auck	South Auck	Waikato	Tauranga	Eastern BoP	Gisborne	Rotorua	Taupo	Taranaki	Ruapehu	Hawkes Bay	Wanganui	Manawatu	Wairarapa	Wellington	Hutt	Nelson-Marl	West Coast	Canterbury	South Cant	Otago	Southland
AIDS[1]			19			2											2				3			
			1.6			1.5											0.5				0.7			
Campylobacteriosis	232	1239	1057	826	1034	321	83	82	148	99	292	22	421	118	271	100	1120	444	153	76	1041	276	400	293
	165.5	288.3	287.4	219.9	335.0	248.5	169.2	186.6	229.5	314.2	283.1	154.0	293.3	202.1	184.1	261.4	441.5	336.7	125.0	250.6	259.2	353.2	240.8	271.2
Cholera	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0.2	0.3	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Creutzfeldt-Jakob	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0
Cryptosporidiosis	27	75	96	77	189	32	8	13	24	24	22	0	170	33	43	6	95	15	8	8	58	52	65	67
	19.3	17.5	26.1	20.5	61.2	24.8	16.3	29.6	37.2	76.2	21.3	0	118.4	56.5	29.2	15.7	37.4	11.4	6.5	26.4	14.4	66.5	39.1	62.0
Dengue fever	4	15	20	12	5	3	0	0	1	3	0	0	0	0	4	0	6	5	1	0	9	1	2	2
	2.9	3.5	5.4	3.2	1.6	2.3	0	0	1.6	9.5	0	0	0	0	2.7	0	2.4	3.8	0.8	0	2.2	1.3	1.2	1.9
Gastroenteritis	26	95	108	44	10	10	4	31	12	13	23	0	7	10	72	11	41	15	33	6	273	19	68	7
	18.5	22.1	29.4	11.7	3.2	7.7	8.2	70.5	18.6	41.3	22.3	0.0	4.9	17.1	48.9	28.7	16.2	11.4	27.0	19.8	68.0	24.3	40.9	6.5
Giardiasis	33	194	230	142	149	69	29	28	30	9	26	3	106	19	41	7	147	46	42	7	161	23	44	18
	23.5	45.1	62.5	37.8	48.3	53.4	59.1	63.7	46.5	28.6	25.2	21.0	73.8	32.5	27.9	18.3	57.9	34.9	34.3	23.1	40.1	29.4	26.5	16.7
H. influenzae	1	2	1	0	0	0	0	1	0	0	2	0	1	0	0	0	1	1	0	0	1	0	0	3
type b disease	0.7	0.5	0.3	0	0	0	0	2.3	0	0	1.9	0	0.7	0	0	0	0.4	0.8	0	0	0.2	0	0	2.8
Hepatitis A	0	5	14	26	3	0	0	2	0	0	0	0	0	0	0	1	6	2	0	0	2	0	0	0
	0.0	1.2	3.8	6.9	1.0	0	0	4.6	0	0	0	0	0	0	0	2.6	2.4	1.5	0	0	0.5	0	0	0
Hepatitis B	3	6	5	5	7	4	0	0	0	2	0	0	6	0	1	3	4	1	2	2	3	0	2	1
	2.1	1.4	1.4	1.3	2.3	3.1	0	0	0	6.3	0	0	4.2	0	0.7	7.8	1.6	0.8	1.6	6.6	0.7	0	1.2	0.9
Hepatitis C	2	2	3	2	0	18	3	1	5	2	0	0	2	0	0	0	6	3	1	1	6	0	1	2
	1.4	0.5	0.8	0.5	0.0	13.9	6.1	2.3	7.8	6.3	0	0	1.4	0	0	0	2.4	2.3	0.8	3.3	1.5	0	0.6	1.9
Hydatids disease	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0
	0.7	0.2	0	0	0	0.8	0	2.3	0	0	0	0	0	0	0	0	0.4	0	0	0	0.5	0	0	0
Lead absorption	4	5	8	3	17	3	1	1	2	0	6	5	5	4	9	1	4	0	8	0	14	10	16	4
	2.9	1.2	2.2	0.8	5.5	2.3	2.0	2.3	3.1	0.0	5.8	35.0	3.5	6.9	6.1	2.6	1.6	0	6.5	0	3.5	12.8	9.6	3.7
Legionellosis	3	3	4	2	13	3	0	0	0	1	0	0	0	1	1	1	2	2	0	0	6	1	2	1
	2.1	0.7	1.1	0.5	4.2	2.3	0	0	0	3.2	0	0	0	1.7	0.7	2.6	0.8	1.5	0	0	1.5	1.3	1.2	0.9
Leprosy	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0.3	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptospirosis	15	5	2	2	22	6	1	8	2	1	3	1	14	0	6	0	2	0	2	1	4	6	1	1
	10.7	1.2	0.5	0.5	7.1	4.6	2.0	18.2	3.1	3.2	2.9	7.0	9.8	0	4.1	0	0.8	0	1.6	3.3	1.0	7.7	0.6	0.9
Listeriosis	1	3	3	1	0	2	0	1	0	0	1	0	0	0	0	0	1	0	0	0	2	1	2	0
	0.7	0.7	0.8	0.3	0	1.5	0	2.3	0	0	1.0	0	0	0	0	0	0.4	0	0	0	0.5	1.3	1.2	0
Malaria	1	2	6	4	6	2	0	0	0	0	2	1	1	0	3	0	5	2	4	1	9	2	2	1
	0.7	0.5	1.6	1.1	1.9	1.5	0	0	0	0	1.9	7.0	0.7	0	2.0	0	2.0	1.5	3.3	3.3	2.2	2.6	1.2	0.9
Measles	3	5	8	4	0	7	0	3	0	0	2	0	7	1	2	0	5	0	5	4	14	0	5	8
	2.1	1.2	2.2	1.1	0	5.4	0	6.8	0	0	1.9	0	4.9	1.7	1.4	0	2.0	0	4.1	13.2	3.5	0	3.0	7.4
Meningococcal	37	37	81	124	72	16	16	11	26	13	10	1	29	6	20	11	24	16	12	3	18	3	54	10
disease	26.4	8.6	22.0	33.0	23.3	12.4	32.6	25.0	40.3	41.3	9.7	7.0	20.2	10.3	13.6	28.7	9.5	12.1	9.8	9.9	4.5	3.8	32.5	9.3
Mumps	7	1	4	4	0	1	3	0	1	0	0	1	5	0	2	0	4	4	1	0	9	2	7	0
	5.0	0.2	1.1	1.1	0	0.8	6.1	0	1.6	0	0	7.0	3.5	0	1.4	0	1.6	3.0	0.8	0	2.2	2.6	4.2	0
Paratyphoid	0	3	10	4	5	1	0	0	0	0	1	0	3	0	1	0	2	1	0	0	2	0	0	0
	0	0.7	2.7	1.1	1.6	0.8	0	0	0	0	1.0	0	2.1	0	0.7	0	0.8	0.8	0	0	0.5	0	0	0
Pertussis	32	73	57	67	203	36	6	3	10	5	4	5	22	9	7	14	103	103	206	34	185	30	65	56
	22.8	17.0	15.5	17.8	65.8	27.9	12.2	6.8	15.5	15.9	3.9	35.0	15.3	15.4	4.8	36.6	40.6	78.1	168.3	112.1	46.1	38.4	39.1	51.8
Rheumatic fever	10	8	36	27	9	1	8	1	0	1	0	1	2	2	0	1	3	1	0	0	0	0	0	0
	7.1	1.9	9.8	7.2	2.9	0.8	16.3	2.3	0	3.2	0	7.0	1.4	3.4	0	2.6	1.2	0.8	0	0	0	0	0	0
Rubella	0	3	0	2	0	0	0	0	0	0	1	0	10	0	0	0	4	1	0	0	7	0	0	2
	0	0.7	0	0.5	0	0	0	0	0	0	1.0	0	7.0	0	0	0	1.6	0.8	0	0	1.7	0	0	1.9
Salmonellosis	84	218	208	207	191	68	26	7	32	17	75	14	133	42	87	25	184	87	114	23	238	75	163	99
	59.9	50.7	56.6	55.1	61.9	52.7	53.0	15.9	49.6	53.9	72.7	98.0	92.6	71.9	59.1	65.3	72.5	66.0	93.2	75.8	59.3	96.0	98.1	91.6
Shigellosis	0	24	39	39	6	2	0	1	1	1	2	0	2	2	0	0	5	1	2	0	22	2	6	0
	0	5.6	10.6	10.4	1.9	1.5	0.0	2.3	1.6	3.2	1.9	0	1.4	3.4	0	0	2.0	0.8	1.6	0	5.5	2.6	3.6	0
Tetanus	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
	0.7	0	0	0	0	0	0	0	1.6	0	1.0	0	0	0	0	0	0	0	0.8	0	0	0	0	0
Tuberculosis	12	39	84	67	20	11	7	2	5	5	0	0	18	3	12	2	39	12	3	1	26	5	5	3
	8.6	9.1	22.8	17.8	6.5	8.5	14.3	4.6	7.8	15.9	0	0	12.5	5.1	8.2	5.2	15.4	9.1	2.5	3.3	6.5	6.4	3.0	2.8
Typhoid	0	4	6	8	0	0	0	0	1	0	2	0	0	0	1	0	1	0	0	0	2	0	1	0
	0	0.9	1.6	2.1	0	0	0	0	1.6	0	1.9	0	0	0	0.7	0	0.4	0	0	0	0.5	0	0.6	0
VTEC / STEC	1	4	2	1	22	7	3	3	2	0	1	1	3	1	2	0	1	0	1	0	8	0	8	5
	0.7	0.9	0.5	0.3	7.1	5.4	6.1	6.8	3.1	0	1.0	7.0	2.1	1.7	1.4	0	0.4	0	0.8	0	2.0	0	4.8	4.6
Yersiniosis	8	42	50	42	49	26	8	10	7	6	6	1	16	7	10	0	26	17	5	4	44	16	16	13
	5.7	9.8	13.6	11.2	15.9	20.1	16.3	22.8	10.9	19.0	5.8	7.0	11.1	12.0	6.8	0	10.2	12.9	4.1	13.2	11.0	20.5	9.6	12.0

Cases this year (unshaded cells) — Crude rate per 100 000 population based on 2001 census (shaded cells)

[1] AIDS data is reported for the greater Auckland and Wellington areas, rather than by health district

[2] Further data are available from the local medical officer of health

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