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Cigarette smoking declining in fourth form girls but not in boys

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Surveys of fourth form (Year 10) students reported a 37% increase in daily smoking from 11.6% in 1992 to 15.5% in 1997. We report the results of two further surveys carried out in 1998 and 1999 to determine trends in smoking prevalence among fourth form students. Data from students attending the 72 schools in all four surveys were analysed. The proportion of girls smoking at least monthly declined from a peak of 31.7% in 1997 to 30.0% in 1999, and the trend was particularly marked among Maori girls. In contrast, the prevalence of smoking in boys remained unchanged, at 23.1% in 1997 and 24.1% in 1999. The decrease between 1997 and 1999 for both sexes combined is very small, equal to two in 1000 fewer students each year having smoked in the last month, despite current youth anti-smoking efforts. The role of cigarette design and ingredients, in those brands still gaining in popularity among adolescents, needs investigation and regulating. Further national monitoring of fourth form smoking is required to confirm sex- and ethnic-specific smoking trends. Medical practitioners should opportunistically ask adolescents about smoking behaviour and advise accordingly, and promote smokefree homes, schools and public places.

Daily smoking among fourth form (Year 10, predominantly 14 to 15 year old) students decreased by 2.3% per year from 1960 to 1992[1] and then increased by 3.5% per year during 1992-7.[2] Action on Smoking and Health (ASH) carried out national surveys of fourth form students in 1992, 1997 and 1998 to monitor smoking and cigarette purchasing behaviour. The 1992 survey found that the prevalence of smoking was higher in girls than in boys, and higher in Maori students than among non-Maori.[2] The 1997 survey reported that the prevalence of daily smoking had increased by 37%, from 11.6% in 1992 to 15.5% in 1997.[1] Surveys of fourth form students in Wellington observed a similar increase from 1991 to 1997.[3] Increasing prevalence of smoking among adolescents has also been reported in Canada,[4] Switzerland[5] and England.[6]

A further national survey in 1998 found that there had been small, statistically non-significant reductions in the prevalence of daily smoking among girls (16.5% to 15.4%) and boys (13.5% to 12.5%). This paper updates the report of the 1997 survey[1] with results from surveys in 1998 and 1999, and compares smoking trends over the 1992-99 period.

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Methods

Methods used in the 1992 and 1997 surveys have been reported previously.[1,2] In these surveys and in the 1998 survey, schools were selected non-randomly to ensure a representative sample of school types: single and coeducational, private and public, and rural and urban. In the 1999 survey, for the first time all New Zealand schools with fourth form students were invited to participate.

All fourth form classes at each school were invited to participate in the survey. Questionnaires were mailed to schools and disseminated among students by school staff. Students anonymously self-completed similar questionnaires in all four surveys. The

Contents

Cigarette smoking declining in fourth form girls but not in boys 33
Surveillance and control notes 36
Surveillance data 38
Public health abstracts 40
Travel health 40

questionnaires contained questions on age, sex, self-identified ethnicity, smoking behaviour (frequency of smoking, quantity of cigarettes per week, preferred brand(s) of cigarettes), cigarette sources and ease of access to cigarettes. The same questions were worded identically in all surveys, but more options were provided in later surveys for place of purchase and preferred brands. School socioeconomic status was based on the Ministry of Education decile ranking of the school population, ranging from low socioeconomic status in decile one to high socioeconomic status in decile ten.

The ethnicity question allowed only one choice in 1992, but more than one choice in 1997, 1998 and 1999. In the latter three surveys, ethnicity was classified using the following hierarchical sequence: students identifying as Maori solely or in combination with another ethnicity were included in the Maori ethnic group; students identifying with a Pacific Islands ethnicity solely or in combination with another ethnicity (other than Maori) were included in the Pacific Islands ethnic group; students identifying with an Asian ethnic group solely or in combination with another ethnicity (other than Maori or Pacific Islands) were included in the Asian ethnic group; and all remaining students were included in the European ethnic group unless identifying solely with a non-Maori, non-Pacific Islands, non-Asian and non-European ethnicity.

Consent for each survey was obtained from school principals. The North Health Ethics Committee gave permission to survey without formal referral to their committee. Statistical analyses were performed using SAS Version 6.12. The statistical significance of percentage changes between surveys was calculated using the Cochran-Mantel-Haenszel test statistic. All analyses are presented following adjustment for confounders.

Results

This report describes smoking and cigarette purchasing behaviour by fourth-form students at the 72 schools that participated in all four surveys. There were 10 boys' schools, 19 girls' schools and 43 coeducational schools. Sixty-eight schools were state run and four were private. Thirty-seven schools were urban (from cities with 100 000 population or more) and 35 were non-urban. The mean socioeconomic decile ranking for the 72 schools was 6.0 based on the 1991 census data and 6.6 based on the 1996 census data. The mean decile ranking in all secondary schools, based on the 1996 census, was 5.5.[7]

The 72 schools returned questionnaires from 10 841 students in 1992 (73% response based on the fourth form roll), from 10 390 in 1997 (69% response), from 11 319 in 1998 (72% response), and from 11 504 in 1999 (72% response). Analyses were restricted to questionnaires returned for 14 and 15 year old European, Maori, Pacific Islands or Asian students. Questionnaires were excluded from analysis if no information was provided about sex, if students were aged 13 or 16 years or if age was unknown, if ethnicity was recorded as 'other' or unknown, or if smoking status was not recorded. Analysis was therefore restricted to 10 364 responses for 1992, 9628 for 1997, 10 374 for 1998 and 10 916 for 1999.

The demography of students in the 72 schools changed over the period of the four surveys. The main changes in ethnic composition of survey participants between 1992 and 1999 were a decline in the proportion of European students (79.0 to 71.2%), and increases in the proportions of Asian (4.3 to 9.7%), Maori (11.7 to 13.7%) and Pacific Islands (5.1 to 5.5%) students. These changes were significant among girls ($p<0.001$) and among boys ($p<0.001$).

Overall smoking behaviour: Changes in smoking behaviour over the period of the four surveys are shown separately for girls (*Figure 1*) and boys (*Figure 2*). Daily smoking by girls increased from 12.0% in 1992 to a peak of 16.3% in 1997 ($p<0.01$), followed by progressive declines to 15.7% in 1998 and 15.2% in 1999. The latter percentage was significantly lower than the peak value in 1997 ($p<0.05$), adjusted for age and ethnicity, suggesting that a real decline in daily smoking by fourth form girls is occurring. The proportion of girls smoking weekly increased from 6.2% in 1992 to 8.7% in 1998 and was followed by a decline to 7.7% in 1999, although the 1999 level is still significantly higher than in 1992 ($p<0.01$). The proportion of girls smoking monthly remained unchanged at about 7%, and the proportion smoking less than monthly increased from 12.4% in 1992 to 14.3% in 1999 ($p<0.01$). These changes have been accompanied by a decrease in the proportion of girls smoking previously from 28.4% in 1992 to 22.6% in 1999 ($p<0.01$) and an increase in the proportion of girls who had never smoked from 30.4% in 1997 to 33.1% in 1999 ($p<0.01$), similar to the 1992 level of 33.8%. The total smoking prevalence (smoking at least monthly) among girls increased from 25.2% in 1992 to 31.7% in 1997, then declined to 31.6% in 1998 and 30.0% in 1999 ($p<0.01$ compared with 1992). Thus, the overall pattern suggests that levels of smoking among girls decreased during 1998 and 1999 from the peak in 1997.

Among boys (*Figure* 2), the proportion smoking daily increased from 11.1% in 1992 to 13.5% in 1999 ($p<0.01$), the proportion smoking weekly remained stable at about 5%, and the proportion smoking monthly increased from 4.1% in 1992 to 5.5% in 1999 ($p<0.01$). The total smoking prevalence among boys increased from 20.4% in 1992 to 23.1% in 1997, 22.8% in 1998 and 24.1% in 1999 ($p<0.01$ compared with 1992). The proportion of fourth form boys in 1999 who had never smoked (35.8%) was lower than in 1992 (38.3%, $p<0.01$) and unchanged from 1997 (35.7%). The overall pattern among boys suggests that the increase in smoking predominantly occurred between 1992 and 1997, but in contrast with girls there has been no obvious trend in smoking prevalence between 1997 and1999. Further monitoring is required to determine whether male smoking prevalence has reached a plateau or is increasing slowly. Despite the different direction in smoking trends between the sexes, in 1999 the total smoking prevalence remained lower among boys than among girls. The decrease in smoking between 1997 and 1999 for both sexes combined is very small, equal to two in 1000 fewer students each year having smoked in the last month.

Ethnic-specific trends in smoking behaviour: Ethnic-specific trends in prevalence of daily smoking are shown separately for girls (*Figure 3*) and boys (*Figure 4*). The steepest decline in

Figure 1: Distribution of fourth form girls by smoking frequency, 1992-99

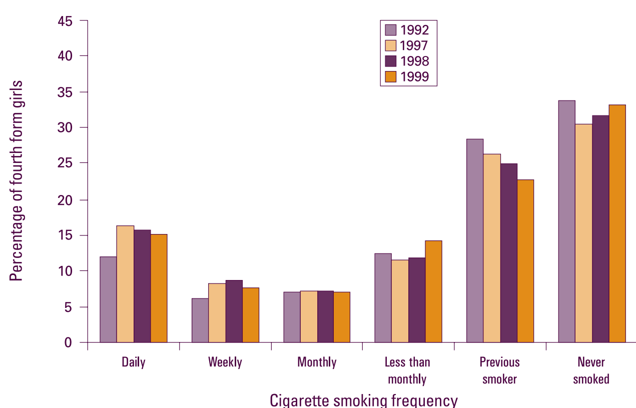


Figure 2: Distribution of fourth form boys by smoking frequency, 1992-99

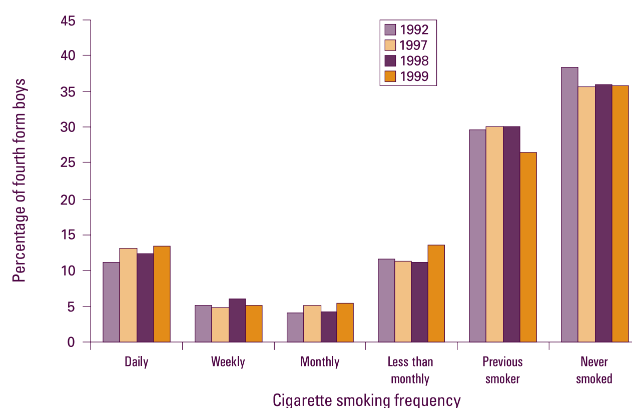


Figure 3: Ethnic distribution of fourth form girls smoking daily, 1992-99

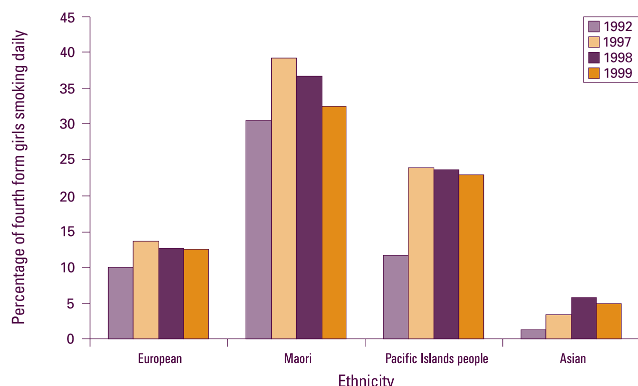
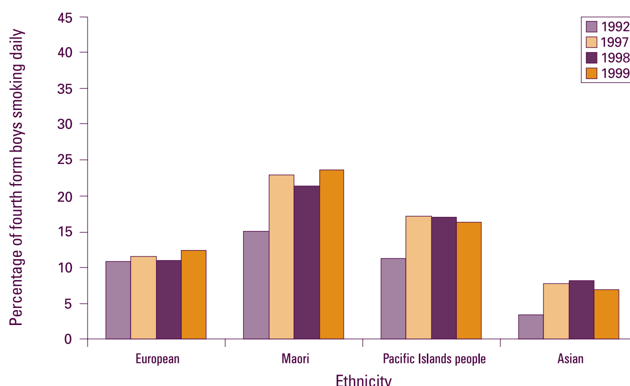


Figure 4: Ethnic distribution of fourth form boys smoking daily, 1992-99



prevalence of daily smoking among girls between 1997 and 1999 occurred among Maori, from 39.2% to 32.4% ($p<0.01$), and the 1999 prevalence of daily smoking by Maori girls was not significantly different from that in 1992 (30.5%). Daily smoking prevalence may also be declining in girls of European ethnicity (from 13.7% in 1997 to 12.5% in 1999) and Pacific Islands ethnicity (from 23.8% in 1997 to 22.8% in 1999), although the prevalence of daily smoking among each of these ethnic groups remained significantly higher than that in 1992 ($p<0.01$) and further surveys are required to determine any downward trend. The earlier increase in prevalence of daily smoking among Asian girls (from 1.2% in 1992 to 5.8% in 1998) and among Asian boys (from 3.4% in 1992 to 8.2% in 1998) appears to have reached a plateau in 1999. The prevalence of daily smoking among boys of European, Maori and Pacific Islands ethnicity remained unchanged from 1997 to 1999 and was higher in 1999 than in 1992 ($p<0.05$).

Cigarette brand preference: Three cigarette brands became increasingly popular between 1992 and 1999: Holiday, introduced in 1991, was preferred by 19.0% of fourth form smokers in 1997 and by 28.0% in 1999; preference for Benson and Hedges increased from 12.1% in 1992 and 21.1% in 1997 to 26.2% in 1999; preference for Marlboro increased from 1.7% in 1992 and 6.4% in 1997 to 7.0% in 1999. Preference for Marlboro was higher among Asian students than among other ethnic groups (26% among Asian boys and 22% among Asian girls in 1999).

Cigarette sources and ease of purchase: The proportion of fourth form students who self-purchased cigarettes progressively decreased from 60.6% in 1992 to 34.0% in 1999, while the proportion obtaining cigarettes from friends increased from 51.3% in 1992 to 65.0% in 1999 (*Table 1*). The proportion obtaining cigarettes through family members remained unchanged after 1997, while the proportion obtaining cigarettes from other people decreased from a peak of 46.2% in 1997 to 40.5% in 1999. The proportion of students who had experienced difficulty in buying or been refused sale of cigarettes decreased significantly from 1997 to 1999 (*Table 2*), suggesting that students perceived purchasing to be somewhat easier in 1999 than in 1997, although still much more difficult than in 1992.

Table 1: Sources of cigarettes obtained by fourth form student smokers, 1992-99

Cigarette source	Percentage of fourth form student smokers			
	1992 n=3521	1997 n=3719	1998 n=4014	1999 n=4419
Self-purchased	60.6	36.2[1]	35.0[1]	34.0[1,2]
Obtained from friends	51.3	58.3[1]	58.8[1]	65.0[1,3,4]
Obtained from family	14.3	26.5[1]	24.9[1]	26.2[1]
Obtained from other source	14.6	46.2[1]	41.0[1,3]	40.5[1,3]

Notes: 1 significant difference ($p<0.01$) compared with 1992
2 significant difference ($p<0.05$) compared with 1997
3 significant difference ($p<0.01$) compared with 1997
4 significant difference ($p<0.01$) compared with 1998

Table 2: Proportion of fourth form student smokers who experienced difficulty purchasing cigarettes in past year, 1992-99

Statement	Fourth form student smokers who purchased cigarettes in past year: percentage agreeing with statement			
	1992 n=3521	1997 n=3719	1998 n=4014	1999 n=4419
Cigarettes difficult to buy	5.7	28.3[1]	21.6[1,3]	18.5[1,3,4]
Refused sale of cigarettes	24.9	61.9[1]	59.8[1]	58.9[1,2]

Notes: 1 significant difference ($p<0.01$) compared with 1992
2 significant difference ($p<0.05$) compared with 1997
3 significant difference ($p<0.01$) compared with 1997
4 significant difference ($p<0.01$) compared with 1998

Discussion

The 1999 fourth form smoking survey suggests that the prevalence of cigarette smoking among fourth form girls, particularly among Maori girls, has declined since 1997 (*Figure 3*). This decline may reflect greater responsiveness of these groups to tobacco control measures implemented during 1997-9, and discussed below. In contrast, the results suggest that smoking prevalence among boys has not changed since 1997, and may be increasing (*Figure 2*).

The schools in the four surveys were not randomly selected. The 72 schools included in each survey had a slightly higher mean socioeconomic decile ranking than all New Zealand schools. The prevalence of daily smoking among fourth form students in these 72 schools (14.5%) was significantly lower ($p<0.01$) than that of other schools that had been included in the 1999 survey but were absent from one or more previous surveys (16.4%). However, the relatively large size of the student numbers in each survey suggests that national trends in smoking prevalence are likely to be similar to those reported for the 72 schools. Repeated surveys of all schools are required to determine national trends with certainty and to provide timely information.

Tobacco control efforts between 1996 and 1999 directed at youth have included the 'Why Start' media campaign, increased school health and health sponsorship funding for adolescent programmes, enforcement of the under-age no-sales law, elevation of the minimum age for purchasing cigarettes from 16 to 18 years, a phase out of packets of 10 cigarettes, cessation of point-of-sale advertising, and an increase in cigarette prices (which were already the third most costly among OECD countries[8]) by 20%. In 1999, Government also funded the first Quit campaign, highlighting the health damage from smoking. Despite these efforts, the prevalence of smoking among fourth formers in 1999 had not decreased to 1992 levels and fewer fourth formers reported difficulty in purchasing cigarettes in 1999 than had done so previously (*Table 2*).

Expenditure on tobacco control in New Zealand is consistent with that of the United States. Expenditure on all tobacco control programmes for youth in 1996-7 was $2.21 per capita (US$ 1.50 at 1996 exchange rates), equalling the per capita media and schools expenditure of the Californian state campaign in 1988-90.[9,10] Expenditure on the total tobacco control programme was estimated at $3.28 per capita in 1996-7, and increased to $7.37 by 2001, comparable to the US$4.02 (NZ$9.56 at June 2001 exchange rates) per capita average for five leading American state programmes.[11]

The government campaign in 1996-99 has begun to neutralise, but has not reversed, the trends of the early 1990s. It lacks media prominence (in contrast to the road safety campaign), and it is undermined by:

- Tobacco retailers, who continue to sell to a third of adolescent smokers despite the risk of prosecution.
- The families of the 26% of adolescent smokers who are supplied with cigarettes by family-members (*Table 1*).
- Increased screen portrayals of smoking in film coupled with increased adolescent cinema attendance, tripling adolescent exposure to 'smoky' films in the 1990s compared with the 1980s.[1] Smoking scenes are perceived as adding excitement and pleasure. Anti-smoking cinema advertising before the film can neutralise this effect.[12]
- Cigarette manufacturers, who have made New Zealand cigarettes smoother and sweeter, making initiation easier and smoking more addictive.[13] Tobacco industry reports show that 16 of 20 top-selling Canadian cigarettes are designed to provide increased nicotine with little effort from the smoker (elasticity), a feature absent in the least popular brands.[14] Increases in the popularity among fourth form students of three New Zealand brands alone are equal to twice the increase in fourth form smoking between 1992 and 1997. These three brands further increased their popularity between 1997 and 1999, despite the ban on advertising.
- The presence of second-hand tobacco smoke. Over one-third of fourth formers live in a smoky home,[2] and young adult leisure venues are often smoky. Adolescents with smokefree homes, schools and public places are less likely to smoke.[15]

In conclusion, national efforts have not been sufficiently powerful to overcome opposing influences and return adolescent smoking prevalence to 1992 levels. Policies and programmes need to be broadened in scope and strengthened. We recommend more public education on the health damage from smoking and second hand smoke, stronger legislation for smokefree schools and youth leisure venues, advertising in cinemas to neutralise the effect of 'smoky' film portrayals, and investigation of the role of certain cigarette brands in increasing or maintaining New Zealand adolescent smoking rates during the 1990s. This last measure would mean regulating to obtain full disclosure of cigarette design and ingredients, thereby opening the way to regulation of the cigarette itself in order to limit its addictiveness and palatability to young smokers. Medical practitioners should opportunistically ask adolescents about smoking behaviour; discourage uptake; encourage smoking cessation; and promote smokefree homes, schools and public places as a way of reducing adolescent smoking rates.

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Surveillance and control notes

Leptospirosis fatality

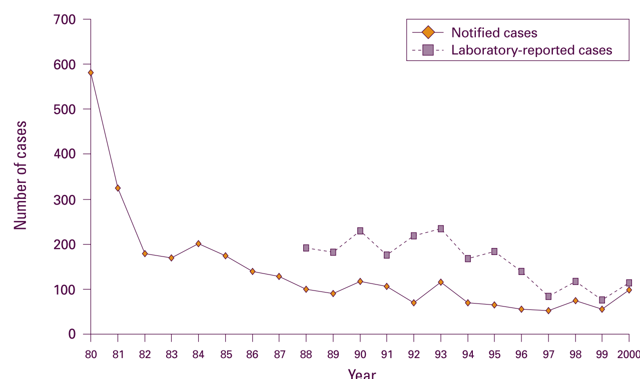
A 48 year old man died three days after admission to Auckland Hospital with a febrile illness. *Leptospira interrogans* was later identified by polymerase chain reaction (PCR) examination of specimens collected at post-mortem. This is the first confirmed leptospirosis fatality in New Zealand in recent years.

The man was a fisheries worker, lived north of Auckland, and had no history of contact with farm animals or of recent overseas travel. He had experienced a four day history of fever, headache, myalgia and oliguria prior to admission, and was found to be dehydrated, hypotensive and to have marked conjunctivitis on examination. Preliminary investigations showed marked renal impairment, leucocytosis, thrombocytopaenia, liver dysfunction and pyuria. Blood cultures and baseline leptospiral and rickettsial serological studies were negative. He later developed a gastrointestinal haemorrhage, and died following pulmonary haemorrhage. *L interrogans* was identified from PCR of blood and hepatic and splenic tissue, but further serotyping could not be performed due to the acute phase of the illness. Based on the *Leptospira* species, the source of the infection is most likely to have been either rats or pigs. Contact with rat urine was strongly suspected.

In 2000, a total of 98 cases of leptospirosis were notified (2.7 cases per 100 000), a significant ($p<0.001$) increase on the 55 cases notified in 1999 (1.5 per 100 000) and the highest annual number of notified cases since 1993 (*Figure 1*). The increased incidence of notified leptospirosis reflects an increased sensitivity to notification: 89.5% (102/114) of cases identified by laboratories in 2000 could be matched to a notified case, an increase from 68.4% (52/76) in 1999. The increased sensitivity to notification means that descriptive epidemiological analyses based on notified cases in 2000 are likely to be more robust than in previous years.

Gender was recorded for 97 of the 98 notified cases. Of these, 90 cases (92.8%) were male and seven (7.2%) were female. Of the 73 cases for whom hospitalisation status was recorded, 33 (45.2%) were hospitalised. The rate of leptospirosis varied throughout the country: rates higher than the national average were recorded in South Canterbury (16.3 per 100 000), Ruapehu (11.9), Gisborne (10.9), West Coast (9.3), Nelson Marlborough (7.7), Hawkes Bay

Figure 1: Leptospirosis cases by year, 1980-2000



(7.0), Northland (4.4), Tauranga (4.4), Waikato (4.3), Taranaki (3.7), Southland (3.6), Wanganui (3.3) and Otago (2.9) Health Districts.

Of the 84 notified cases with recorded occupation, 33 (39.3%) were farmers (dairy, pig, deer) or farm workers, 38 (45.2%) were meat workers (freezing workers or butchers), two (2.4%) were forestry workers and one was a pest control operator (1.2%). The occupations of the remaining 10 cases did not appear to involve exposure to leptospires. The rate for meat workers in 2000 (191.7 per 100 000) was significantly higher (p<0.001) than in 1999 (60.5), although this may be partly related to increased sensitivity to notification. The rate among farmers and farm workers in 2000 was 51.6 cases per 100 000. Sources of exposure among notified cases in 2000 that had not previously been reported in New Zealand included a case in a triathlete with a history of travel in Brazil and six cases among meat workers from processing plants exclusively involved in processing sheep meat.

The infecting *Leptospira* species and serovar was identified in 112 of the laboratory-reported cases in 2000. Failure to identify species and serovar in two cases was due to cross-reactions between serovars. After decreasing between 1995 and 1999, the annual number of laboratory-reported cases diagnosed with *L borgpetersenii* serovar hardjo (hardjobovis) increased in 2000 (*Table 1*).

Table 1: Laboratory-reported leptospirosis cases by year, 1995-2000

Leptospira species / serovar	Animal reservoirs	Year					
		1995	1996	1997	1998	1999	2000
L borgpetersenii sv hardjo[1]	Cattle, sheep, deer	87	57	32	32	21	50
L interrogans sv pomona	Pigs, cattle, sheep, deer	29	21	22	20	11	27
L borgpetersenii sv ballum	Hedgehogs, rodents, pigs	25	28	12	27	17	22
L borgpetersenii sv tarassovi	Pigs	10	4	7	12	9	8
L interrogans sv australis	Cattle[2]	0	0	0	2	1	2
L interrogans sv copenhageni	Rodents, dogs	6	3	4	8	7	2
L interrogans sv canicola	Dogs,[2] cattle[2]	1	0	1	0	0	1
L interrogans sv bratislava	Pigs,[2] cattle[2]	17	13	0	5	0	0
Unidentified *Leptospira* species		17	10	6	11	10	2
Total[3]		**183**	**136**	**84**	**117**	**76**	**114**

Notes: 1 Previously denoted as *L interrogans* serovar hardjo
2 Possible animal reservoir: never isolated from animals in New Zealand
3 More than one serovar is recorded for some cases

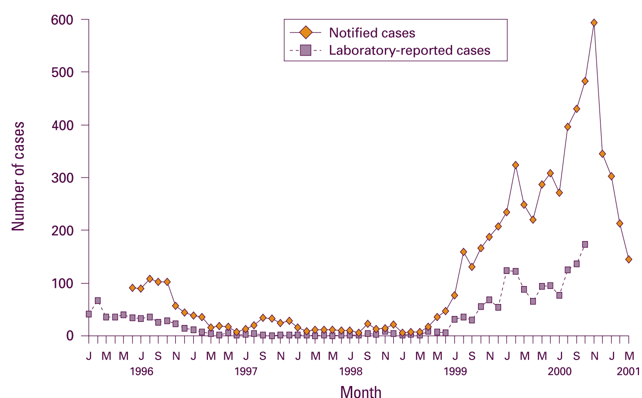
Patients with leptospirosis commonly present with fever, headache, chills, myalgia or conjunctival suffusion. A variety of other manifestations are possible, including meningitis, rash, haemolytic anaemia, jaundice, hepatorenal failure, mental confusion, myocarditis, and pulmonary involvement with or without haemoptysis. Cases may report a history of skin or mucous membrane contact with animal urine 4-19 days prior to onset of symptoms. Urine exposure may be direct, for example while milking cows, or indirect, for example while swimming or wading through surface water contaminated by rats. Animals identified as important reservoirs of leptospires infecting humans in New Zealand are cows, pigs, sheep, deer, dogs and rats. Appropriate investigation of leptospirosis should include collection of two blood specimens for estimation of leptospiral titres: one specimen should be taken on presentation and the second should be taken after an interval of four weeks. Treatment with antibiotics (eg, penicillin or doxycycline) is effective if commenced in the first week of illness.

The Occupational Safety and Health Service (OSH) of the Department of Labour recenthly published *Guidelines for the control of occupationally acquired leptospirosis*. Leptospirosis is defined as a ‘significant hazard’ by the Health and Safety in Employment Act 1992. The guidelines include identified risk situations and occupations, suggested preventive measures and actions, checklists of occupations by risk, case studies of people who have contracted leptospirosis, and pointers to further information (Clinical details reported by Dr Ian Dittmer, Auckland Hospital).

Pertussis epidemic declining

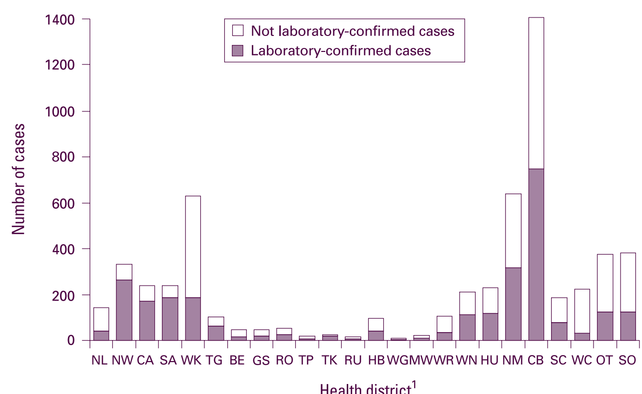
The pertussis epidemic appears to have peaked in November 2000, with the number of cases declining each month since then (*Figure 2*). By the end of March 2001, a total of 5781 cases had been notified since the start of the epidemic in June 1999. Of these cases 2737 (47.3%) were laboratory confirmed. There have been 412 hospitalisations (7.9% of cases for whom this information was recorded) and one death reported.

Figure 2: Pertussis laboratory-reported and notified cases by month, Jan 1996 to March 2001



During the 22 month period between June 1999 and March 2001, the greatest number of pertussis cases have been notified from Canterbury (1406), Nelson Marlborough (639), Waikato (630), Southland (382), Otago (375), and North West Auckland (331) Health Districts (*Figure 3*). In line with the overall decline in notifications since November 2000, by March 2001 notifications were relatively low in all health districts.

Figure 3: Pertussis notifications by health district, June 1999 to March 2001



Note: 1 See health district surveillance data table (page 39) for a full description of health district names

Surveillance data

National surveillance data - March 2001

Disease[1]	Current year - 2001[2]: Mar 2001 cases	Current year - 2001[2]: Cumulative total year-to-date	Current year - 2001[2]: Current rate[3]	Previous year - 2000: Mar 2000 cases	Previous year - 2000: Cumulative total year-to-date	Previous year - 2000: Previous rate[3]	Trends - March 2001: Percentage change[7] (significance)
AIDS	3	7	0.8	2	6	0.8	
Campylobacteriosis	596	2488	225.7	826	2752	239.7	***
Cholera	0	0	0	0	0	0	
Creutzfeldt-Jakob disease	0	0	0.1	0	0	0.1	
Cryptosporidiosis	155	243	26.4	30	62	21.0	***
Dengue fever	1	1	0.2	1	1	0.1	*** → 133
Gastroenteritis[4]	51	207	20.6	104	195	17.7	**
Giardiasis	149	377	44.3	169	458	46.6	
H influenzae type b disease	0	2	0.3	2	3	0.3	
Hepatitis A	8	16	3.0	8	15	2.5	
Hepatitis B (acute)[5]	6	19	2.0	4	24	2.5	
Hepatitis C (acute)[5]	5	13	2.1	5	21	2.5	
Hydatid disease	0	1	0.1	0	0	0.1	
Influenza[6]	7	13	7.1	0	4	22.0	***
Lead absorption	6	33	3.5	12	31	4.0	
Legionellosis[6]	6	19	2.0	4	16	2.0	
Leprosy	0	0	0.1	0	1	0.2	
Leptospirosis	6	24	2.5	15	32	2.2	
Listeriosis	2	5	0.5	2	9	0.7	
Malaria	11	22	3.2	3	17	1.3	*** → 141
Measles	8	17	1.5	8	25	3.1	***
Meningococcal disease	45	110	14.4	21	67	13.9	
Mumps	2	13	1.4	3	13	1.5	
Paratyphoid	2	5	0.7	1	2	0.4	
Pertussis	144	666	110.5	248	807	50.7	*** → 118
Rheumatic fever	1	6	2.7	7	17	1.7	***
Rubella	8	9	0.9	1	3	0.9	
Salmonellosis	222	663	54.9	215	474	47.4	***
Shigellosis	24	57	3.7	11	37	3.6	
Tetanus	0	0	0	0	0	0.1	
Tuberculosis	35	107	10.2	36	93	11.8	*
Typhoid	2	7	0.6	2	8	0.4	
VTEC/STEC infection	7	18	1.6	16	26	2.0	
Yersiniosis	46	130	10.3	43	154	13.0	***

Percentage change axis: -100% -75% -50% -25% 0% 25% 50% 75% 100%

Significance of difference:
* p<0.05
** p<0.01
*** p<0.001

Notes:
1 Other notifiable infectious diseases reported in March: Nil
2 These data are provisional
3 Rate is based on the cumulative total for the current year (12 months up to and including March 2001) or the previous year (12 months up to and including March 2000), expressed as cases per 100 000
4 Cases of gastroenteritis from a common source or foodborne intoxication (eg, staphylococcal intoxication or toxic shellfish poisoning)
5 Only acute cases of this disease are currently notifiable
6 Surveillance data based on laboratory-reported cases only
7 Percentage change is the difference between the number of cases in the current year (12 months up to and including March 2001) and the previous year (12 months up to and including March 2000). This difference is expressed as a percentage of the number of cases in the previous year.

Surveillance data

Surveillance data by health district - March 2001

Cases this month ☐ Current rate[1] ☐

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
	Cases for March 2001,[2] and current rate[1,2] by health district[3,4]																							
AIDS[3]	0	2			0	0	0	0	0	0	0	0	0	0	0	0	1		0	0	0	0	0	0
	0.7	1.8			0	0	0	0	0	0	0	0	0	0	0	0	0.8		0.9	0	0.5	0	0.6	0
Campylobacteriosis	13	69	65	42	51	12	2	4	5	8	21	1	25	8	15	2	58	20	10	1	65	21	47	31
	152.5	211.8	216.9	176.5	270.7	164.0	109.4	135.5	131.7	195.4	187.2	89.5	231.4	133.5	101.1	197.6	303.8	200.6	116.6	197.4	345.1	345.8	273.9	322.5
Cholera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Creutzfeldt-Jakob disease	0	0	0	0	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	0	0	0	0	0	0	0	0	0.7	0	0	0	0	0	0	0	0.3	0	0	0
Cryptosporidiosis	1	13	32	18	11	1	0	3	1	1	1	0	58	1	0	0	8	1	0	0	1	0	2	2
	18.2	12.2	20.0	16.7	44.6	17.7	4.0	30.6	71.3	22.8	15.0	0	85.0	24.4	22.6	31.2	18.9	31.7	0.9	33.9	20.2	75.4	31.9	36.8
Dengue fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	0	0	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0.8	0	0	0	1.3	0	0
Gastroenteritis	3	9	9	1	1	0	0	3	0	0	1	0	0	0	2	2	0	0	1	0	10	1	6	2
	7.3	20.8	24.3	14.0	2.3	13.3	8.0	6.6	20.1	42.3	34.6	0	1.4	1.6	31.9	18.2	10.7	8.3	22.3	15.4	56.1	44.0	25.5	7.2
Giardiasis	2	10	22	13	20	3	4	2	4	0	2	0	17	3	0	1	17	1	3	0	14	1	6	4
	35.7	48.7	72.0	38.9	58.5	62.9	29.8	28.4	66.6	42.3	16.8	6.0	69.0	11.4	21.3	23.4	67.1	31.7	15.4	98.7	33.1	33.9	27.2	23.4
H influenzae type b disease	0	0	0	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	0.9	0.3	1.8	2.0	0	0	0	0	0	0	0	0	0	0	1.5	0	0	0.3	0	0	0
Hepatitis A	0	1	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	1.8	4.3	5.6	0.7	2.7	0	15.3	3.1	0	0	0	0	0	0	0	0.4	0.8	1.7	0	10.9	3.8	1.2	1.8
Hepatitis B	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
	1.5	2.0	2.0	1.5	4.0	1.8	2.0	2.2	1.5	3.3	0	0	4.9	0	1.3	5.2	1.2	0.8	1.7	3.1	2.6	1.3	1.2	1.8
Hepatitis C	0	0	0	0	0	2	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	0	0.8	0.3	0.6	1.0	16.0	8.0	4.4	12.4	0	0.9	0	3.5	0	0	0	1.6	3.0	2.6	3.1	2.6	2.5	1.7	0.9
Hydatids	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0.3	0.9	0	2.2	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0
Influenza[5]	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0
	0	0	20.0	0	10.9	0	0	0	0	0	0	0	0	0	0	0	8.2	0	0	0	34.1	0	2.3	0
Lead absorption	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	1	0
	2.2	0.8	1.4	0.9	4.6	2.7	0	8.7	1.5	3.3	0.9	23.9	3.5	9.8	4.7	2.6	3.7	0	6.0	3.1	7.2	11.3	6.4	0.9
Legionellosis[5]	0	1	0	0	4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	2.2	1.5	0.9	0.6	6.3	0	0	0	0	0	0.9	0	0	3.3	1.3	5.2	2.5	4.5	0	3.1	3.4	0	2.3	0.9
Leprosy	0	0	0	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	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0
Leptospirosis	1	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0
	2.2	1.0	0.6	0.6	5.0	5.3	0	13.1	0	0	3.7	6.0	6.3	1.6	2.7	2.6	0.4	0	5.1	6.2	1.3	15.1	2.9	1.8
Listeriosis	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	0	0.8	0.6	1.2	0.3	0	0	0	0	0	0	0	0	0	0	0	0.4	1.5	0	0	0.8	1.3	0	0.9
Malaria	0	0	2	1	3	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	2	0	0	0
	1.5	0.8	1.2	2.0	3.6	0	0	2.2	0	3.3	1.9	23.9	0.7	0	36.6	0	2.9	2.3	1.7	0	1.6	5.0	0.6	2.7
Measles	1	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0	1	0
	2.2	2.5	2.0	0.3	0	0	0	2.2	1.5	0	0	0	3.5	1.6	1.3	0	0.4	1.5	2.6	0	3.4	1.3	0.6	3.6
Meningococcal disease	3	1	6	11	6	0	1	0	1	0	1	0	0	0	0	1	2	0	2	0	2	0	8	0
	23.3	10.7	23.4	38.0	15.2	11.5	23.9	28.4	20.1	16.3	4.7	17.9	12.5	11.4	6.0	15.6	9.5	7.5	6.0	0	4.4	5.0	11.6	4.5
Mumps	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
	2.9	1.3	1.7	1.2	0	0	2.0	0	1.5	0	0	6.0	3.5	1.6	1.3	0	2.5	0.8	4.3	0	1.6	1.3	0.6	0
Paratyphoid	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	0	0.5	1.2	0.6	1.0	0	0	0	0	0	0.9	0	1.4	1.6	2.0	0	0.4	2.3	0	0	1.0	0	0	0
Pertussis	3	5	2	4	17	2	2	0	2	0	0	1	2	4	4	3	20	20	8	5	22	1	15	2
	83.2	39.1	50.6	40.7	178.8	72.7	93.5	96.2	80.6	58.6	6.6	89.5	54.4	13.0	10.0	265.2	62.2	142.5	381.6	672.3	252.5	104.4	164.5	56.6
Rheumatic fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	8.0	1.3	6.7	8.5	3.0	1.8	11.9	2.2	3.1	0	0	0	2.1	0	0	2.6	1.6	1.5	0	0	0	0	0	0
Rubella	0	1	0	0	0	0	0	0	0	0	1	0	4	0	0	0	0	1	0	0	1	0	0	0
	0	0.8	0.9	0	0	0	0	0	0	0	0.9	0	3.5	0	0	0	1.6	2.3	1.7	0	2.3	0	1.2	0
Salmonellosis	7	17	16	35	21	4	5	2	2	1	8	0	12	2	9	3	9	15	7	1	24	5	13	4
	38.7	41.6	37.3	31.6	48.3	39.0	37.8	37.2	29.4	48.9	46.8	11.9	50.9	47.2	73.8	145.6	46.9	46.8	72.0	30.8	69.3	104.4	108.3	130.3
Shigellosis	0	2	9	4	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	7	0	0	0
	2.2	4.1	10.7	9.7	2.3	0	0	2.2	1.5	0	0	0	2.1	0	0	0	2.5	3.8	0.9	0	4.4	3.8	1.2	0
Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	1.6	0	0	0	0	0	0	0	0	0	0
Tuberculosis	1	3	10	11	2	1	0	0	2	0	0	0	1	0	0	0	1	1	0	0	1	0	1	0
	5.8	8.9	24.3	20.5	6.3	5.3	13.9	6.6	4.6	6.5	1.9	11.9	8.4	1.6	10.0	7.8	20.2	15.1	1.7	0	2.8	1.3	5.2	3.6
Typhoid	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	0	0.8	1.7	1.8	0.3	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0	0.5	0	0.6	0
VTEC/STEC infection	0	0	0	0	3	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0
	0	0.5	0	1.2	5.0	3.5	2.0	0	4.6	3.3	5.6	6.0	2.1	3.3	0	0	0.4	0	0.9	0	0.5	5.0	4.1	1.8
Yersiniosis	1	3	7	4	11	2	1	3	0	0	1	0	2	0	0	0	4	2	0	0	4	0	1	0
	1.5	10.9	14.2	8.8	12.6	20.4	13.9	13.1	17.0	16.3	2.8	6.0	5.6	1.6	2.0	2.6	11.5	8.3	6.9	12.3	14.0	16.3	4.6	14.4

Notes: 1 Current rate is based on the cumulative total for the 12 months up to and including March 2001, expressed as cases per 100 000
2 These data are provisional
3 AIDS data are reported for the greater Auckland and Wellington areas, rather than by health district
4 Further data are available from the local medical officer of health
5 Surveillance data based on laboratory-reported cases only

Public health abstracts

Trends in adult smoking prevalence reported from MONICA Project

The World Health Organization (WHO) MONICA Project is a multinational study to monitor the trends and determinants of cardiovascular disease, and involves collaborating centres in 21 countries including New Zealand. Trends in adult cigarette smoking prevalence over a 10-year study period in 36 populations of the WHO MONICA Project have been reported. Data were obtained from population-based surveys of smoking behaviour conducted between the early 1980s and mid-1990s, and included over 300 000 subjects aged 25 to 64 years. Smoking prevalence among men decreased by more than 5% in 16 of the 36 populations, remained static in most others, but increased significantly in Beijing. Smoking prevalence among women decreased by more than 5% in nine populations, but increased by more than 5% in six populations. For women, smoking tended to increase in populations with low prevalence and decrease in populations with high prevalence; for men, the reverse pattern was observed (Molarius A, Parsons RW, Dobson AJ, et al. Trends in cigarette smoking in 36 populations from the early 1980s to the mid-1990s: findings from the WHO MONICA Project. Am J Public Health 2001; 91: 206-12).

Editorial note: Since 1985, New Zealand has implemented a programme of tobacco control that has included increased tobacco taxation, regulation of tar yields, restricted adolescent access to tobacco products, expansion of smokefree environments, banning of tobacco advertising and tobacco sponsorships, mass media campaigns, smoking cessation services ('Quitline') and subsidies for smoking cessation therapies. Regular surveys of smoking behaviour have been commissioned by the Ministry of Health, and have shown that smoking prevalence among males and females aged 15 years and older decreased from 30% in 1986 to 25% in 2000. The decline in smoking prevalence among all age groups in the 1980s has slowed for those 35 years and older and appears to have discontinued for those less than 35 years of age in the 1990s. Further information is contained in *Tobacco facts*, published on the websites http:\\www.moh.govt.nz and http:\\www.ndp.govt.nz.

Room for improvement in preventing early-onset group B streptococcal disease

Surveillance of early-onset group B streptococcal (GBS) disease in the United States has shown a reduction in incidence from 0.55 cases per 1000 live births in 1998 to 0.39 in 1999. However, of the 1998-99 cases only 40% of 128 mothers with a positive screen or at least one risk factor and no GBS test result received prophylactic antibiotics (Early-onset group B streptococcal disease – United States, 1998-1999. MMWR 2000; 49: 793-6). A 1999 survey on the adoption of recommended prevention strategies is presented in a later report. Sixty percent (117/201) of hospitals had a formal policy, with 53% using a screening-based approach (swabs at 35-37 weeks gestation), 31% using a risk-based approach (GBS transmission risk factors), and 14% using a combination of the two (Hospital-based policies for prevention of perinatal group B streptococcal disease – United States, 1999. MMWR 2000; 49: 936-40).

Editorial note: From 1998 to 1999, a nationwide New Zealand study identified 56 cases of early-onset GBS disease from a birth cohort of 112 000, giving a rate of 0.5 cases per 1000 live births. Fifty-one mothers of these infants had not received prophylaxis, and 32 (58%) of these had risk factors for early-onset GBS disease. Fourteen (74%) of the 19 hospitals in the study had a stated prevention policy, and 41 cases (73%) were born in these centres. Five used risk assessment alone and nine recommended both screening and a risk-based approach. (Pediatr Res 2001; 49 Suppl 4: 225A). Currently no standard prevention guidelines for GBS have been published in New Zealand. Most centres follow the CDC/ACOG recommendations, but as in the United States there is scope for further improvement. Risk factors for early-onset GBS disease are intrapartum fever, prolonged rupture of membranes of more than 18 hours, premature labour or rupture of membranes at less than 37 weeks, previous baby with GBS disease, and presence of urinary tract infection due to GBS.

Travel health

Hepatitis E worse for pregnant women and those with chronic liver disease

Although hepatitis E is a major cause of epidemic hepatitis and acute sporadic hepatitis in developing countries, there is little data on the risk of this disease for travellers. This report reviewed published cases and seroconversion studies of acute hepatitis E among travellers. Of the total 161 infected travellers, 3.7% (6/161) were reported to have developed fulminant hepatitis. Two were women in their third trimester of pregnancy and two had chronic liver disease while two had no known underlying illness. Two of these people died, a case-fatality rate of 1.2% (included one person with chronic liver disease secondary to hepatitis C and one person with no underlying illness). The most common reported travel destinations were in South Asia (India, Nepal, Pakistan, Sri Lanka) (Piper-Jenks N, Horowitz HW, Schwartz E. Risk of hepatitis E infection to travelers. J Travel Med 2000; 7: 194-9).

Editorial note: Advice on the prevention of HEV infection is the same as for other enteric disease. There have not been any imported cases notified in New Zealand and the risk of infection is minimal for most travellers. However, travellers who are pregnant or have underlying liver disease need to be aware of the more severe consequences of such infection.

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