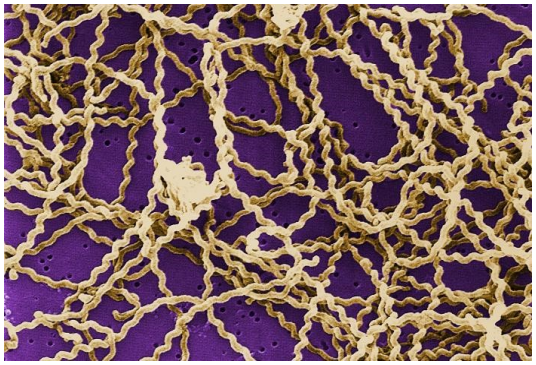
Leptospirosis notifications

HIGHLIGHTS:



- **In 2016, there were 79 leptospirosis notifications in New Zealand. Provisional data from 2017 showed a large increase to 142 leptospirosis notifications.**
- **Leptospirosis notification rates were generally higher for males, people aged 45–54 years, Māori, people of European/Other ethnicity, people living in NZDep2013 quintile 3, and people living in rural areas.**
- **In 2012–16, the highest leptospirosis notification rates were in Hawke's Bay, West Coast, Wairarapa, and Whanganui District Health Boards.**

How leptospirosis relates to environmental health

Leptospirosis is a serious bacterial infection that causes flu-like symptoms (eg fever, headache, muscle aches) that can last for months. In some people, it can cause kidney and liver damage, meningitis, and even death. Infection can go unrecognised if symptoms are mild, flu-like or absent.

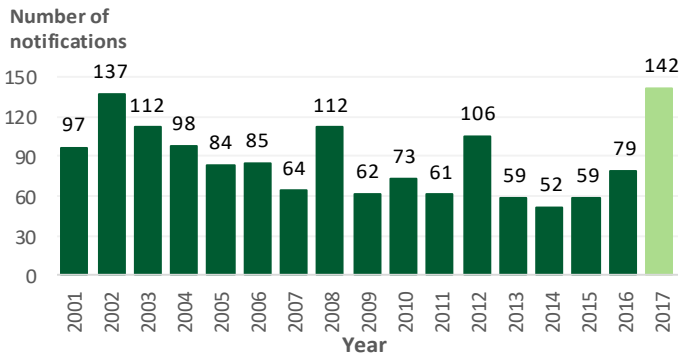
Leptospirosis can be transmitted to humans from animals, including possums, rats, mice and livestock infected with the bacteria. Human infection occurs through contact of damaged skin or mucous membranes (of the eyes, nose or mouth) with infected urine: directly (eg farm- or meat-workers), or indirectly, through contact with urine-contaminated water (eg during water-sports or from flood water) or food (eg handling animal feed exposed to rat urine). In New Zealand, control of leptospirosis has occurred through control of livestock infection by vaccination, rodent control, and work practices that minimise contact with animal urine (WorkSafe New Zealand 2015).

The extent to which infection is transmitted depends on many factors, including climate. *Leptospira* can survive for weeks to months in moist soil or water, and can spread rapidly after heavy rain or flooding. Outbreaks have been reported overseas following extended periods of hot dry weather and following flooding (Levett 2001). Flooding is expected to become more common in New Zealand due to climate change.

Large increase in notifications of leptospirosis from 2014 to 2017

In 2017, there were 142 notifications of leptospirosis, according to provisional numbers. This was a large increase from 2016 (79 notifications) and 2015 (59 notifications) (Figure 1). In part, this may be due to increased use of nucleic acid testing by laboratories or inclusion of cases likely acquired overseas in the provisional data.

Figure 1: Number of leptospirosis notifications, 2001–2017

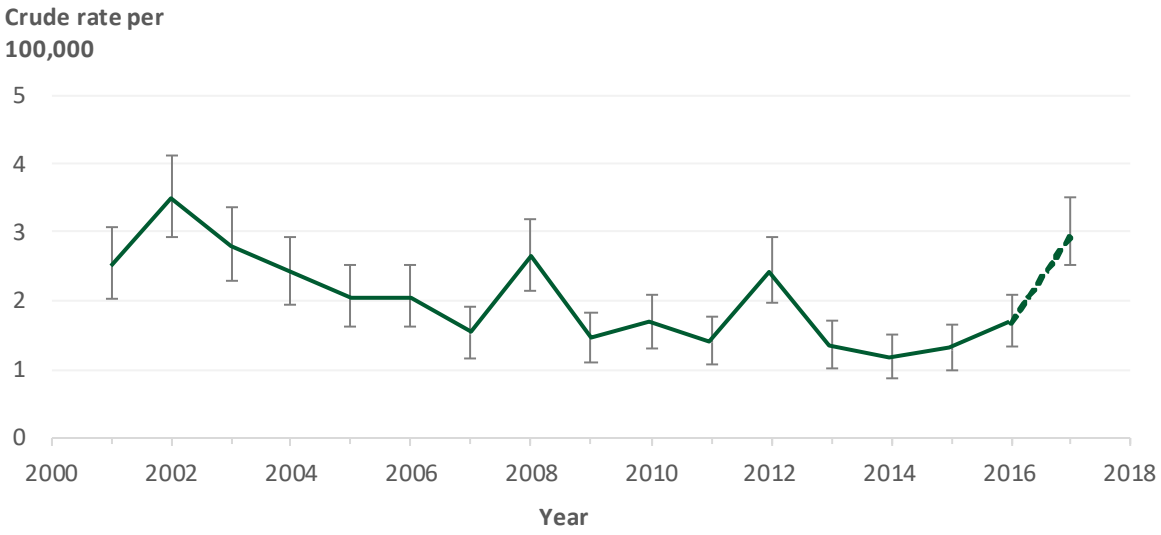


Note: The 2017 number is provisional. It is from published data and includes notification cases who were overseas during the incubation period. It may slightly overestimate notifications from New Zealand.
Source: EpiSurv data, ESR

Leptospirosis notifications

The notification rate of leptospirosis had decreased substantially from 2002 (3.5 per 100,000) to 2014 (1.2 per 100,000), but had increased to 1.7 per 100,000 in 2016, and 3.0 per 100,000 in 2017 (Figure 2).

Figure 2: Leptospirosis notification rate, 2001–2017 (crude rate per 100,000)



Note: The 2017 rate is provisional. It is from published data and includes cases who were overseas during the incubation period. It may slightly overestimate cases from New Zealand.
Source: EpiSurv data, ESR

Some jobs increase the risk of leptospirosis

People working directly with animals and/or involved in their slaughter (in particular cattle, sheep, deer, pigs and possums) are at increased risk of becoming infected with leptospirosis.

Of the 79 notified cases in 2016, 74 cases recorded an occupation, with 62 of these people working in at-risk occupations where they may have been in contact with animals or animal urine-contaminated water. These at-risk occupations included farmers, stockyard workers, abattoir workers, butchers, veterinarians, people working in the bush or with animal pelts, plumbers, waste water workers, fencers, truck drivers and people working in horticulture, forestry or mills.

The remaining 12 leptospirosis cases had occupations that would be less likely to bring them into contact with animals or animal urine-contaminated water.

Table 1: Number of leptospirosis notifications, by occupation type, 2010–2016

	Number of leptospirosis notifications, by occupation type				
Year	At-risk occupations	Other	Total (stated)	Total	% of cases in at-risk occupations (among total stated)
2010	60	12	72	73	83%
2011	46	10	56	61	82%
2012	86	14	100	106	86%
2013	45	12	57	59	79%
2014	43	7	50	52	86%
2015	46	10	56	59	82%
2016	62	12	74	79	84%

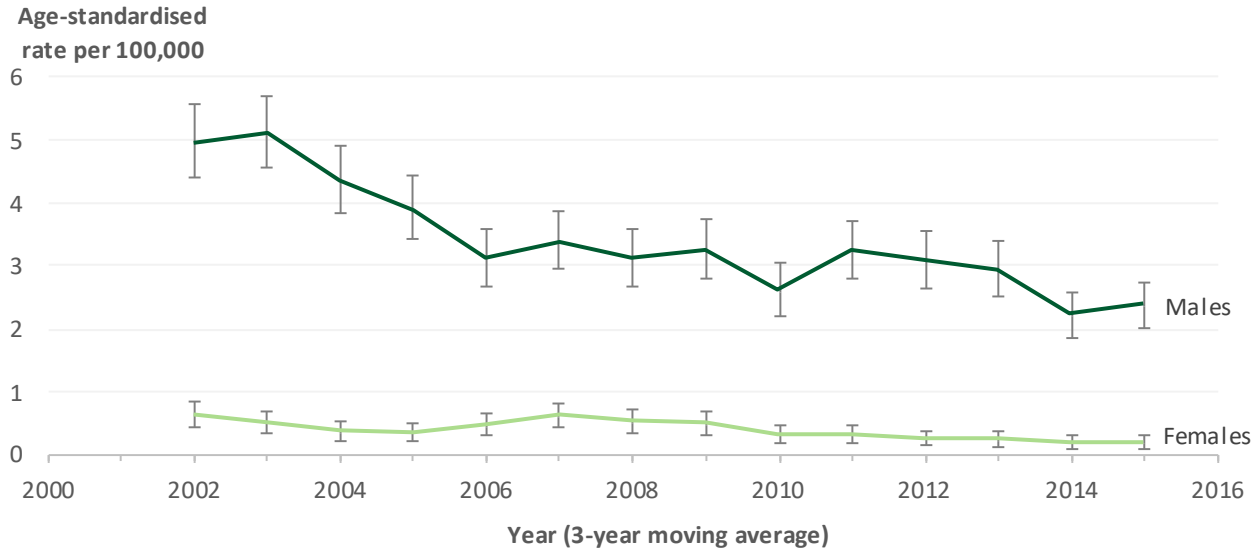
Note: At-risk occupations were defined as farmers, stockyard workers, veterinarians, abattoir workers, butchers, people working in the bush or with pelts, fencers, people working in horticulture, forestry or mills, truck drivers (including stock trucks), and plumbers/waste-water workers (WorkSafe New Zealand 2015). 'Total stated' excludes unknowns.
Source: EpiSurv data, ESR

Males have much higher leptospirosis notification rates than females

In 2016, the majority of leptospirosis notifications were in males (71 notifications), compared with females (8 notifications). In 2014–16, the leptospirosis notification rate was much higher for males (2.4 per 100,000) than for females (0.2 per 100,000), standardising for age (Figure 3).

Over time, the leptospirosis rate for males has decreased substantially, from 5.1 per 100,000 in 2002–04, to 2.2 per 100,000 in 2013-2015. For females, the rate has decreased from 0.6 per 100,000 in 2006–08, to 0.2 in 2014–16.

Figure 3: Leptospirosis notification rates, by sex, 2001–2016 (3-year moving average) (age-standardised rate per 100,000)

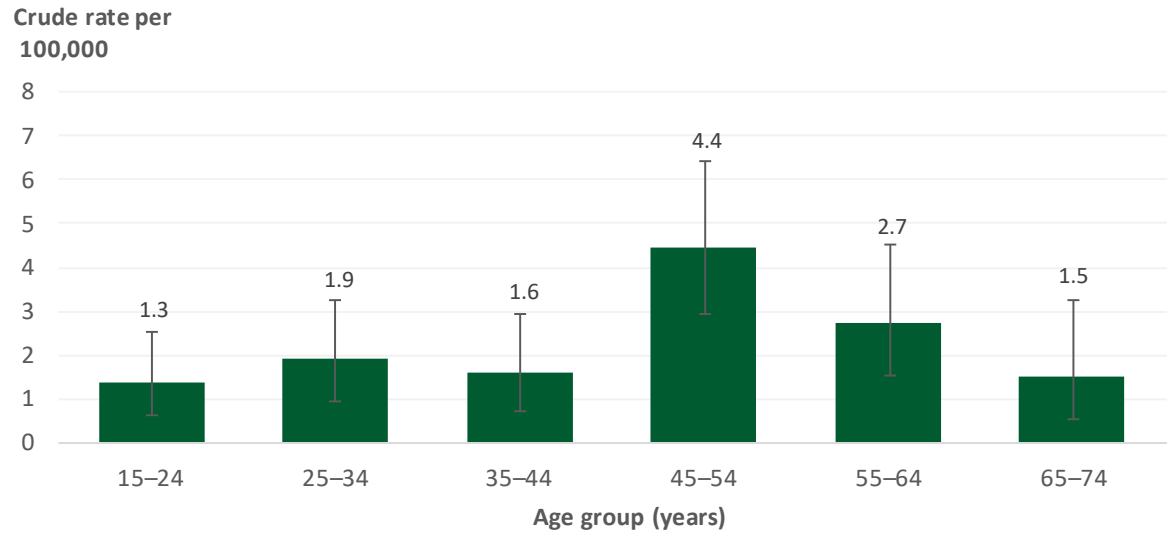


Source: EpiSurv data, ESR

People aged 45–54 years have the highest notification rate

In 2016, the highest leptospirosis notification rate was among people aged 45–54 years (28 cases, 4.4 per 100,000) (Figure 4).

Figure 4: Leptospirosis notification rates, by age group, 2016 (crude rate per 100,000)



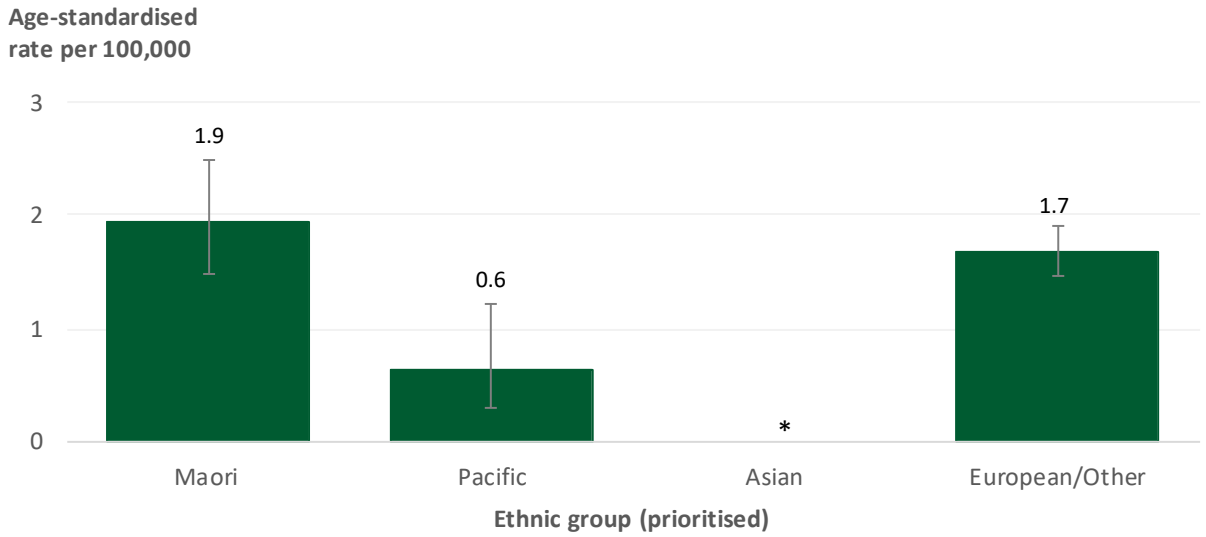
Note: The rates for other age groups have not been presented due to small numbers.
Source: EpiSurv data, ESR

Highest notification rates for Māori and European/Others

In 2016, almost all notifications of leptospirosis were in people of European/Other ethnicity (61 notifications) or Māori ethnicity (12 notifications). There were 3 notifications for people of Pacific ethnicity, and no notifications for people of Asian ethnicity.

In the five-year period 2012–16, the highest leptospirosis notification rates were among Māori (1.9 per 100,000) and European/Others (1.7 per 100,000), standardising for age (Figure 5).

Figure 5: Leptospirosis notification rates, by ethnic group (prioritised), 2012–16 (age-standardised rate per 100,000)

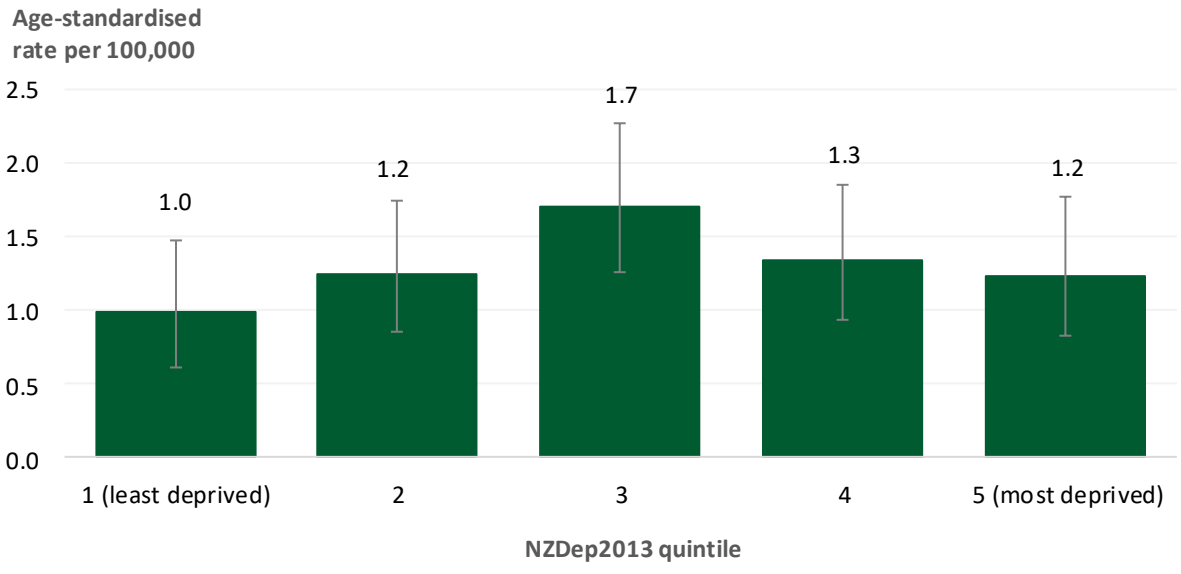


Note: An asterisk (*) shows that the rate was suppressed due to counts less than five.
Source: EpiSurv data, ESR

No major trend by socioeconomic deprivation

In 2014–16, people living in NZDep2013 quintile 3 had a somewhat higher leptospirosis notification rate, standardising for age (Figure 6).

Figure 6: Leptospirosis notification rates, by NZDep2013 quintile, 2014–16 (age-standardised rate per 100,000)



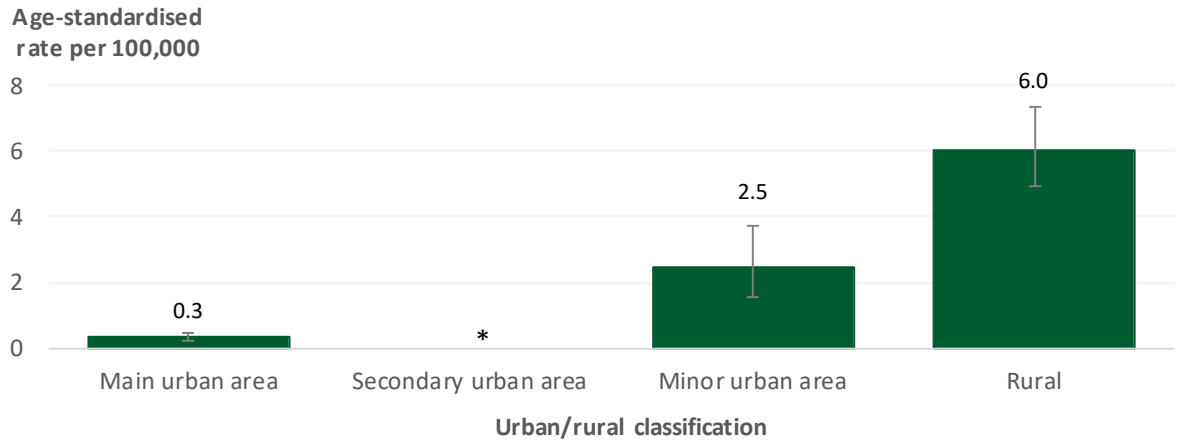
Source: EpiSurv data, ESR

People living in rural areas have the highest notification rates of leptospirosis

In 2016, most leptospirosis notifications were in people living in rural areas (54 out of 79 notifications). A further 12 notifications were for people living in main urban areas, 1 notification for someone living in secondary urban areas, and 10 for people living in minor urban areas.

In 2014–16, people living in rural areas had the highest leptospirosis notification rates, standardising for age (Figure 7). In particular, the leptospirosis notification rate was almost 20 times as high in rural areas than in main urban areas (standardised rate ratio = 19.2, 13.0–28.3).

Figure 7: Leptospirosis notification rates, by urban/rural classification, 2014–16 (age-standardised rate per 100,000)

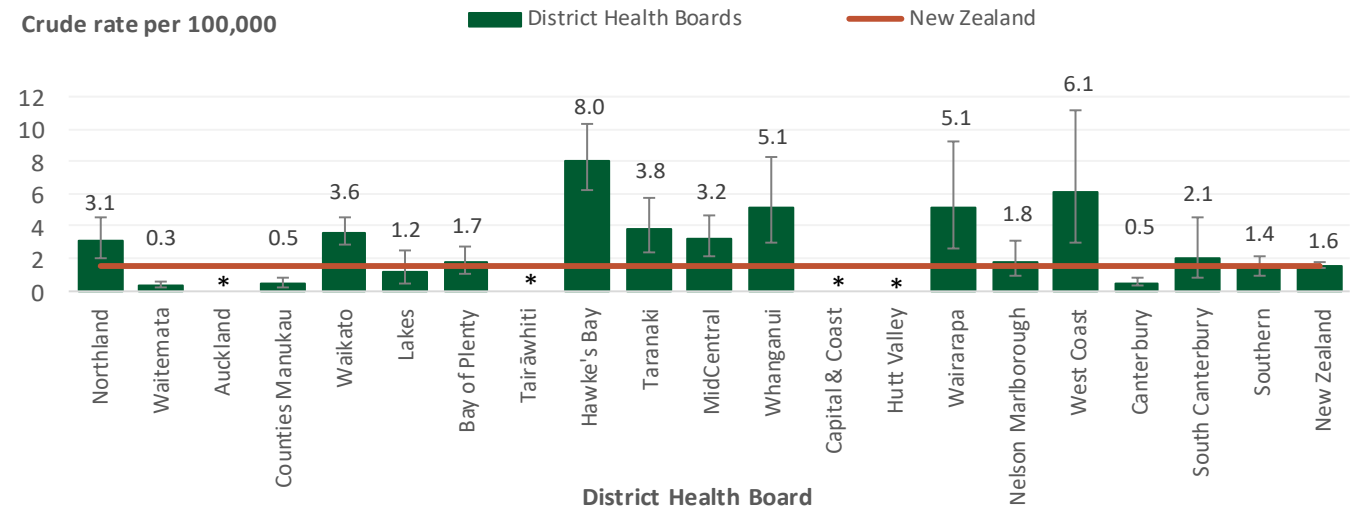


Notes: Urban/rural classification is for 2013. Main urban areas refers to major towns and cities with a population of 30,000 or more. Secondary urban areas are smaller towns with a population of 10,000-29,999 people. Minor urban areas are towns with a population of 1,000-9,999 people. Rural areas include rural centres and rural areas outside of these. An asterisk (*) shows that the rate was suppressed due to counts less than five.
Source: EpiSurv data, ESR

High leptospirosis notification rate in Hawke's Bay DHB in 2012–16

In the five-year period 2012–16, the highest leptospirosis notification rates were in Hawke's Bay, West Coast, Wairarapa and Whanganui District Health Boards (Figure 8).

Figure 8: Leptospirosis notification rates, by District Health Board, 2012–16 (crude rate per 100,000)



Note: An asterisk (*) shows that the rate was suppressed due to counts less than five.
Source: EpiSurv data, ESR

DATA FOR THIS INDICATOR

Data for this indicator for 2001–2016 come from the EpiSurv notifiable disease surveillance database, from Institute of Environmental Science Research (ESR). People who were overseas during the incubation period were excluded from analysis.

The 2017 data is of total leptospirosis notifications from the ESR website (ESR 2018), and includes cases who were overseas during the incubation period; however, this is unlikely to account for the large increase in numbers from 2016 to 2017.

Age-standardised rates have been presented where possible, to take into account the population age structures of different population groups. 95% confidence intervals have been presented as error bars on graphs. However, it should be noted that notifications only cover those people who visited a GP or hospital for treatment, and therefore may underestimate the true rate of disease in the population. Additional information for this indicator is available in the **Metadata sheet**.

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This work is part of the PAWS collaboration (people · animals · wellbeing · surveillance) between two Massey University research groups: the Environmental Health Indicators (EHI) team, and EpiCentre, Massey's veterinary epidemiology training and research centre.