

# Leptospirosis notifications

This factsheet presents information on notifications of leptospirosis, a bacterial infection originating in animals.

## Key facts

- There were 77 leptospirosis notifications in New Zealand in 2021, a rate of 1.5 per 100,000 people.
- Most (59.7%) leptospirosis notifications in 2021 were of people with at-risk occupations, such as farmers and meat workers.
- Rural area residents had a leptospirosis notification rate over 32 times as high as residents in major urban areas.
- Males had a leptospirosis notification rate about 5 times as high as females.

## Leptospirosis and 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 2019).

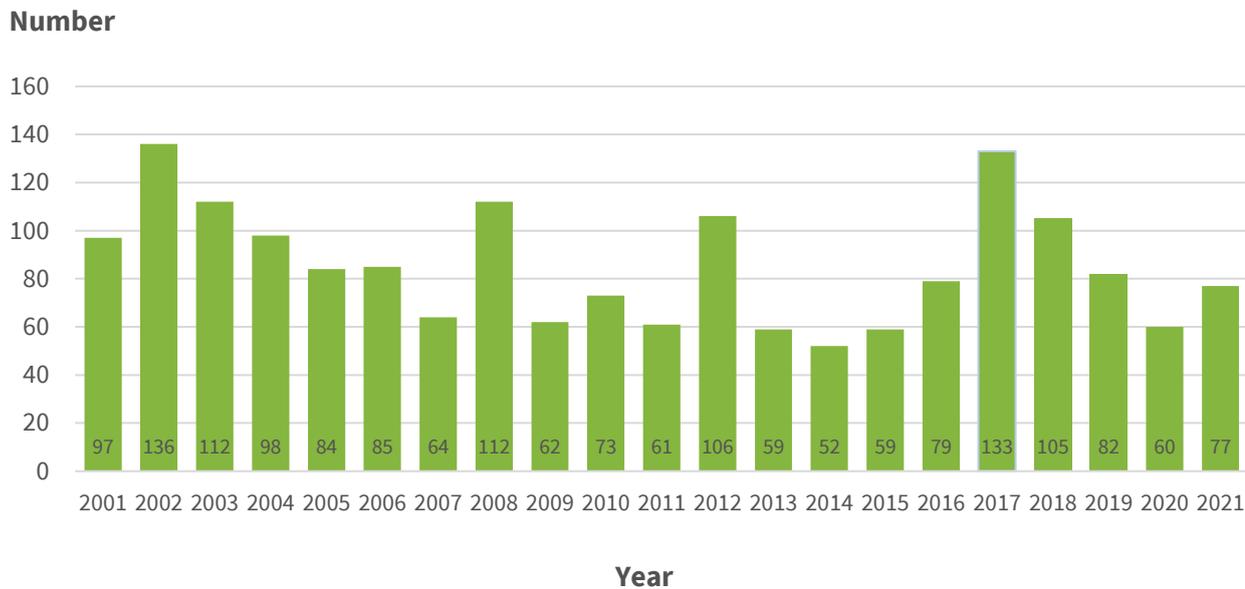
The extent to which infection is transmitted depends on many factors, including climate. *Leptospira* can survive for weeks to months in moist soil or water and spread rapidly after heavy rain or flooding. Outbreaks have been reported overseas following extended periods of hot, dry weather and following flooding (Levett 2001). Flooding is expected to become more common in New Zealand due to climate change. With flooding as a more common transmission route, leptospirosis may start to occur in different groups of people such as women, the young and old, and those living in more urban areas.

## Slight increase in number of notifications

In 2021, there were 77 cases of leptospirosis in New Zealand (excluding cases known to be overseas during the incubation period for infection) (Figure 1). The crude rate in the population was 1.5 cases per 100,000 people. This was a slight increase from the number of cases reported in 2020 (60 cases), but still lower than previous years.

There was an increase in the number of leptospirosis cases from 2015 to 2017 but this has not continued (Figure 1). There was public health concern that higher than usual leptospirosis notifications in 2017 were linked to wet weather and flooding (Cook 2017). Although national data for 2022 and 2023 are not yet available, higher notifications were also reported in the Hawkes Bay following Cyclone Gabrielle in February 2023 (ESR 2023).

**Figure 1: Number of leptospirosis notifications, 2001–21**

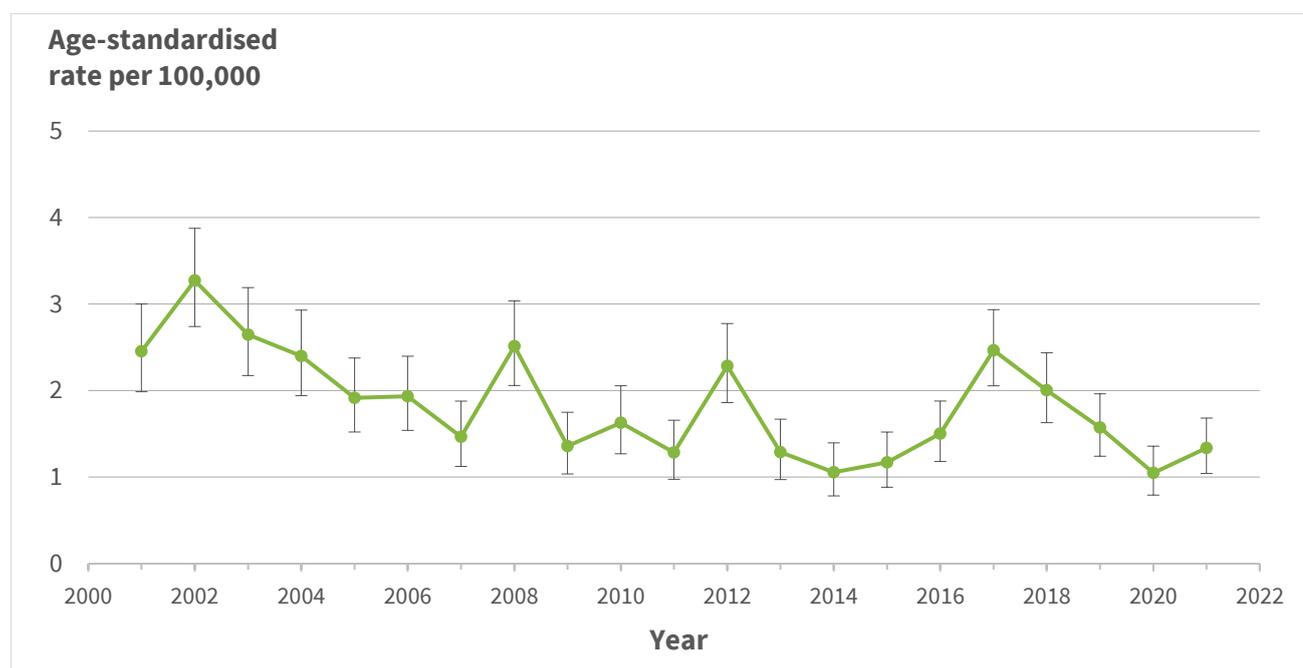


Source: Episurv, ESR 2023

## Age-standardised rates of leptospirosis show a similar pattern to number of notifications

Since 2001, the age-standardised rate of leptospirosis notifications has fluctuated (Figure 2). There was a consistent yearly increase in the rate from 2014 to 2017, with the higher rate in 2017 possibly being due to flooding (Cook 2017). However, this increase in the rate of leptospirosis notifications has now declined, with an all-time low being recorded in 2020 (1.04 per 100,000).

**Figure 2: Leptospirosis notifications, 2010–21 (age-standardised rate per 100,000)**



Note: 95% confidence intervals have been presented as error bars.

Source: EpiSurv, ESR 2023

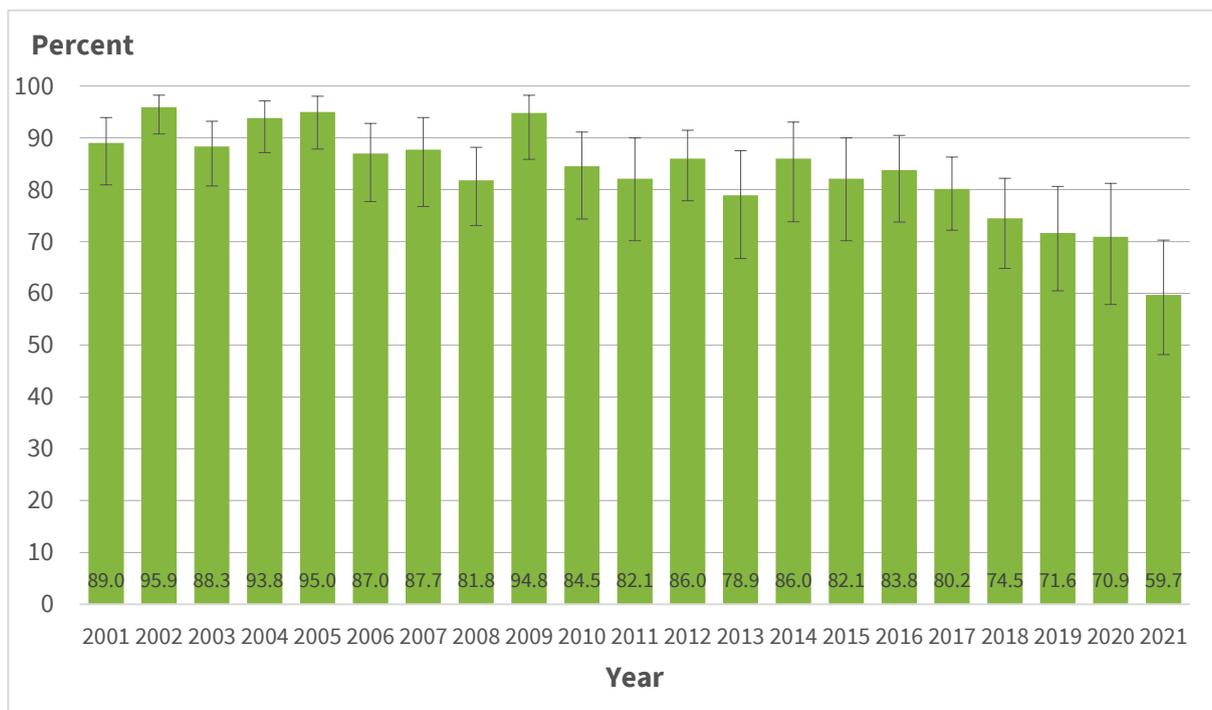
## Some jobs increase the risk of leptospirosis

People working directly with animals and/or involved in their slaughter (particularly cattle, sheep, deer, pigs, and possums) are at increased risk of becoming infected with leptospirosis. These at-risk occupations include 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 (WorkSafe New Zealand 2019). Farmers and farmworkers are now also at a higher risk of infection from increases in flooding.

Of the 77 leptospirosis notifications in 2021, 93.5% recorded an occupation, with 43 (59.7%) people working in at-risk occupations (Figure 3). The remaining leptospirosis cases were people with occupations less likely to bring them into contact with animals or animal urine-contaminated water.

The percentage of notifications with at-risk occupations appears to be decreasing over time; however, most cases still occur in people with high-risk occupations (Figure 3).

**Figure 3: Percentage of leptospirosis notifications with at-risk occupations, 2001–21**



Note: At-risk occupations are defined as 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, based on WorkSafe guidelines (WorkSafe New Zealand 2019). Excludes notifications with an unknown occupation. Low-risk occupations include retirees, office workers, and tradespeople. 95% confidence intervals have been presented as error bars.

Source: EpiSurv, ESR 2023

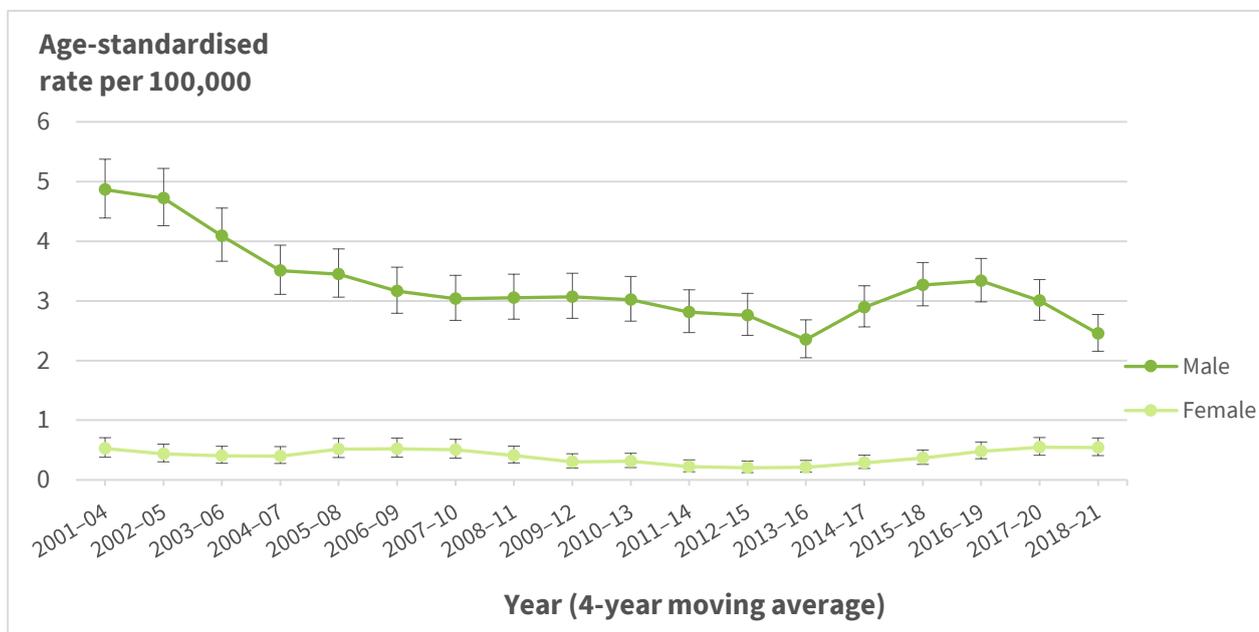
## Males have much higher rates than females

In 2021, males had more leptospirosis cases (61 notifications), compared with females (16 notifications).

Males consistently have much higher rates of leptospirosis than females (Figure 4). In the four-year period 2018–21, the leptospirosis notification rate was approximately five times as high for males (2.5 per 100,000) as for females (0.5 per 100,000), standardising for age.

Following a decline in male leptospirosis notification rates from 2001–04 to 2013–16, there has been a recent increase in 4-year rates, reflecting the higher number of notifications in 2017 and 2018. The rate of notifications in males has declined in recent years. Conversely, leptospirosis rates for females have been relatively stable over this same time period.

**Figure 4: Leptospirosis notifications, by sex, 2001–21 (age-standardised rate per 100,000) (4-year moving average)**



Note: 95% confidence intervals have been presented as error bars.

Source: EpiSurv, ESR 2023

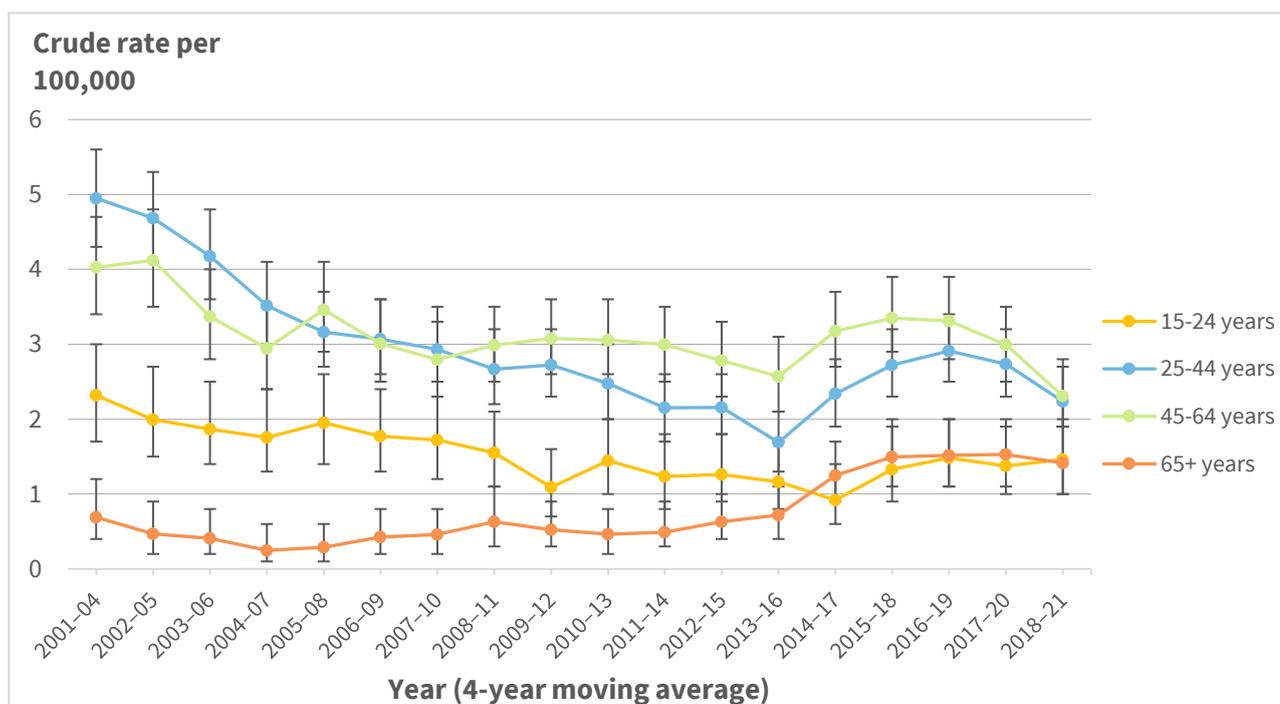
## Working-aged people have the highest leptospirosis rates

Most leptospirosis cases were in people aged 25–44 years, with 30 notifications (39.0%), and 45–64 years, with 24 notifications (31.2%) in 2021. There were 15 notifications in people aged 65+ years and 7 notifications in people aged 15–24 years.

There were consistently higher rates in people aged 25–44 years and 45–64 years from 2001–04 to 2018–21, than in people aged 15–24 years and 65+ years (Figure 5). This age group pattern is consistent with the high percentage of notifications in people working in at-risk occupations.

The difference in rates between people aged 15-24 years and people aged 65+ years has decreased over time from 2001–04 to 2018–2021. The rate of notifications in people aged 15–24 (1.4 per 100,000) is only slightly lower than the rate in people aged 65+ years (1.5 per 100,000) in 2018–21.

**Figure 5: Leptospirosis notifications, by age group ≥ 15 years, 2001–21 (crude rate per 100,000) (4-year moving average)**



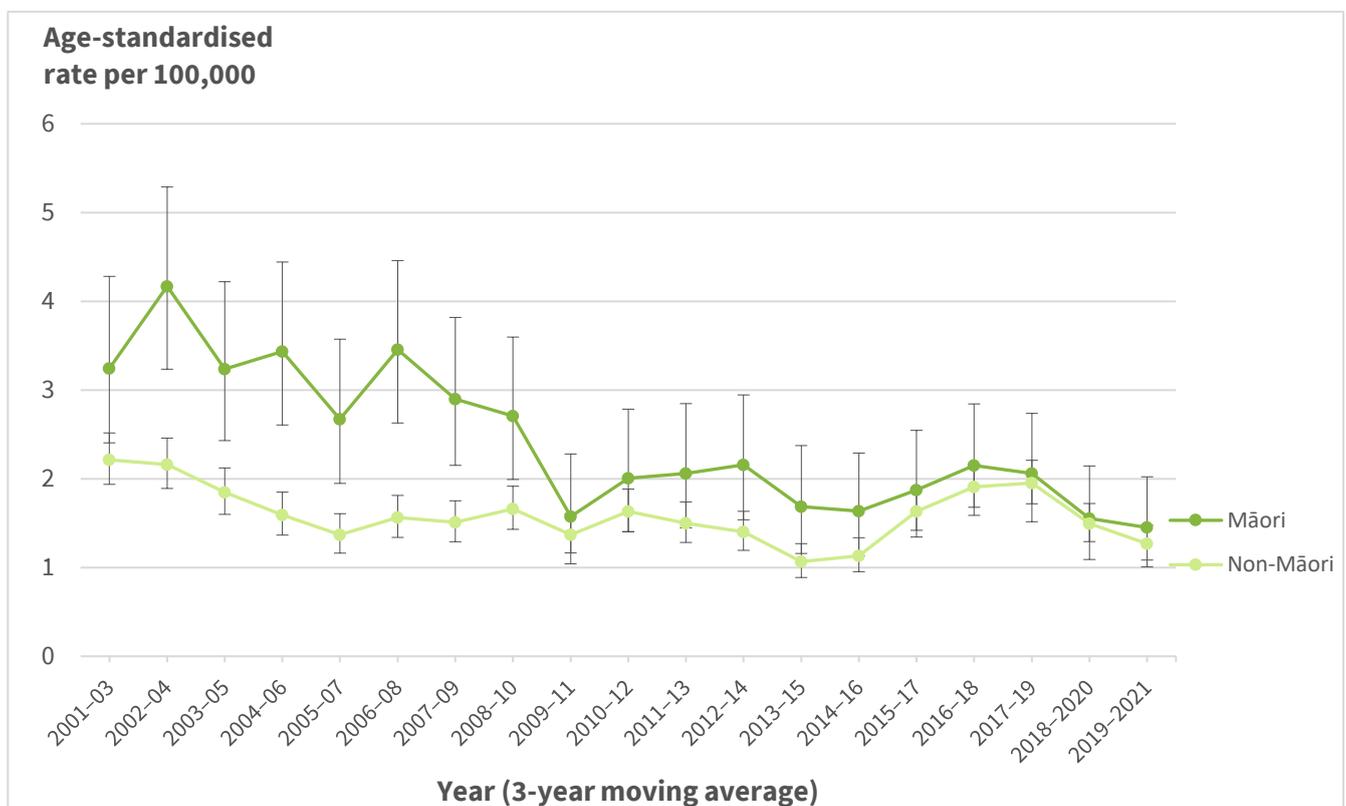
Note: Children aged 0-14 years are no longer included within this indicator. 95% confidence intervals have been presented as error bars.  
Source: EpiSurv, ESR 2023

## Māori and non-Māori have similar leptospirosis rates

In 2021, most leptospirosis notifications were people from the European/Other ethnic group with 60 cases (77.9% of all notifications) or Māori with 16 cases (20.8% of all notifications). There was only one notification for the Asian ethnic group and zero notifications for Pacific peoples.

The difference between Māori and non-Māori rates has decreased over time. In the three-year period 2019–21, Māori had a similar rate of leptospirosis notifications as non-Māori, standardising for age (standardised rate ratio 1.14, 95% CI 0.79–1.65). The rate for Māori has fallen over time from 3.3 per 100,000 in 2001–03 to 1.5 per 100,000 in 2019–21 (Figure 6).

**Figure 6:** Leptospirosis notifications, by ethnic group (Māori/non-Māori), 2001–21 (age-standardised rate per 100,000) (3-year moving average)



Note: 95% confidence intervals have been presented as error bars.

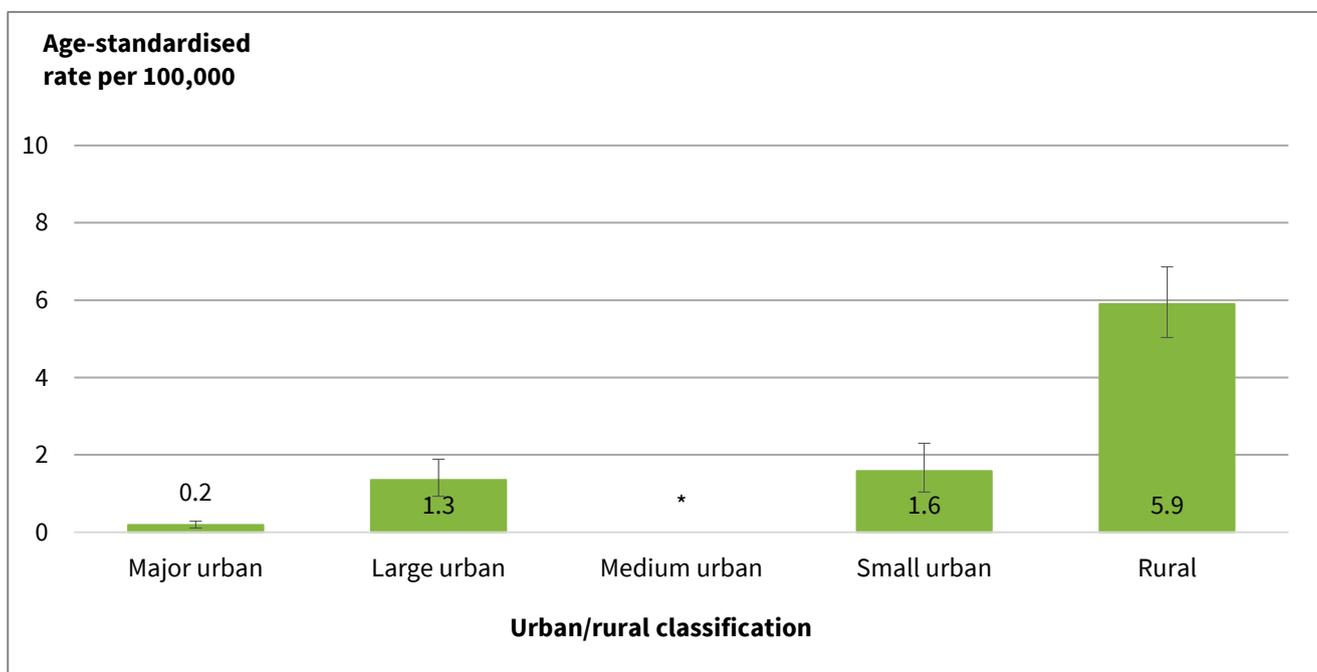
Source: EpiSurv, ESR 2023

## People living in rural areas have the highest leptospirosis rates

In 2021, most leptospirosis cases were people living in rural areas who accounted for 37 notifications (48.1%). A further 12 notifications (15.6%) were for people living in small urban areas, and 3 notifications (3.9%) for people living in major, large, and medium urban areas each.

In the four-year period 2018–21, people living in rural areas had the highest leptospirosis notification rates, standardising for age (Figure 7). The leptospirosis notification rate in rural areas was over 32 times as high as in major urban areas (standardised rate ratio = 32.29, 95% CI 20.19–51.64).

**Figure 7: Leptospirosis notifications, by urban-rural indicator, 2018–21 (age-standardised rate per 100,000)**



Note: An asterisk (\*) shows that the rate was suppressed due to the number of notifications < 20. 95% confidence intervals have been presented as error bars. The urban-rural indicator is the 2018 classification. ‘Major urban’ refers to major towns and cities with a population of 100,000+ residents. ‘Large urban’ refers to larger towns and cities with a population between 30,000–99,999. ‘Medium urban’ is for towns with a population of 10,000–29,999 people. ‘Small urban’ is for towns with a population of 1,000–9,999 people. ‘Rural’ includes rural centres (less than 1,000 residents) and rural areas outside of these.

Source: EpiSurv, ESR 2023

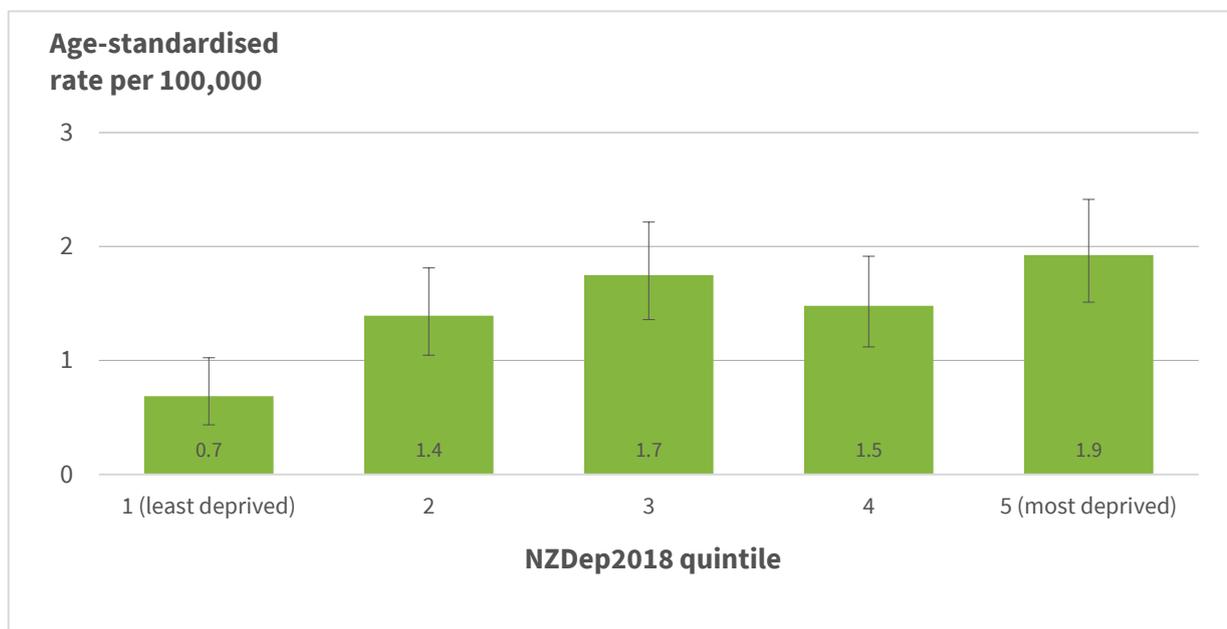
People living in rural areas are likely to be more exposed to *Leptospira* infection in several ways, such as contact with animals, soil, and bush, and working in at-risk occupations.

## Notifications by neighbourhood deprivation

In 2021, the highest number of leptospirosis cases were people living in NZDep2018 neighbourhood deprivation quintile 5 (18 notifications). Quintiles 2, 3, and 4 all had a similar number of notifications (10, 11, and 11 notifications respectively). The lowest number of notifications were in quintile 1 (8 notifications).

In the four-year period 2018–21, people living in NZDep2018 quintile 5 had the highest leptospirosis notification rate (1.9 per 100,000), followed closely by quintile 3 (1.7 per 100,000), standardising for age (Figure 8). The rate in quintile 5 was nearly three times as high as the rate of notifications in quintile 1 (standardised rate ratio 2.80, 95% CI 1.76–4.45).

**Figure 8: Leptospirosis notifications, by neighbourhood deprivation (NZDep2018 quintile), 2018–21 (age-standardised rate per 100,000)**



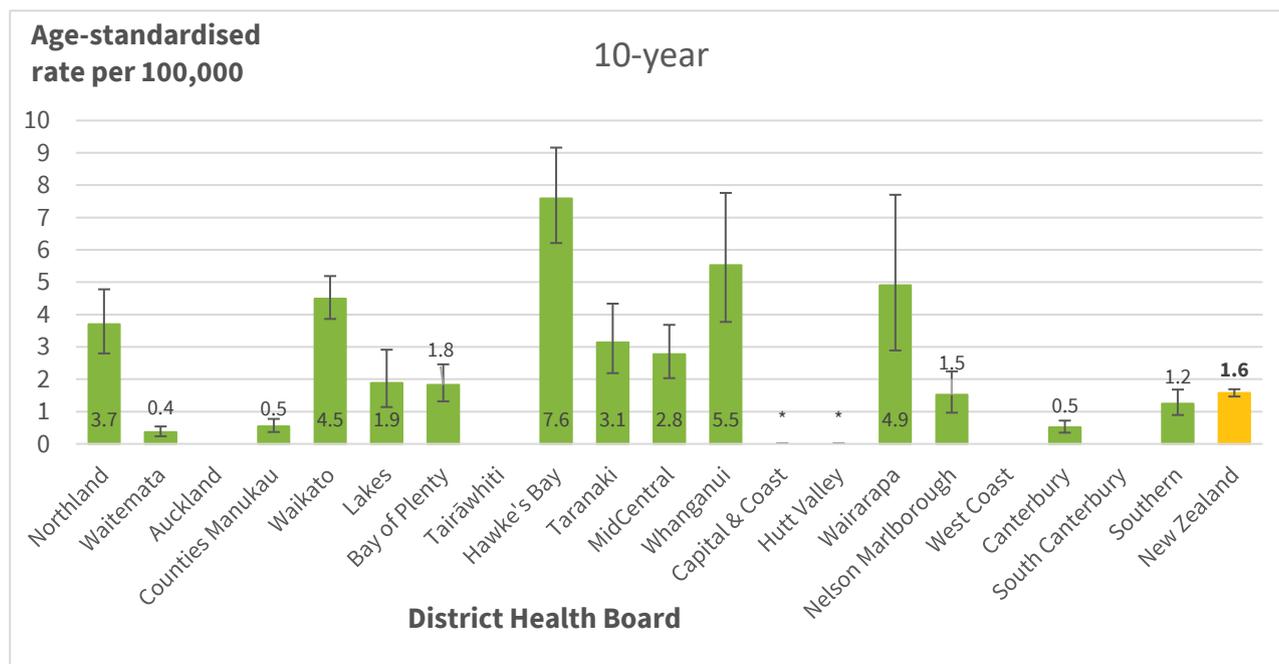
Note: 95% confidence intervals have been presented as error bars.

Source: EpiSurv, ESR 2023

## High leptospirosis rates in West Coast, Hawke’s Bay, and Whanganui districts

In the ten-year period 2012–21, the highest leptospirosis age-standardised rates were in Hawke’s Bay, Whanganui, and Wairarapa districts (Figure 9).

**Figure 9: Leptospirosis notifications, by district, 2012–21 (age-standardised rate per 100,000)**



Note: 95% confidence intervals have been presented as error bars. An asterisk (\*) shows that the rate was suppressed due to the number of notifications < 20.

Source: EpiSurv, ESR 2023

## Data for this indicator

Data come from the EpiSurv notifiable disease surveillance database, from the Institute of Environmental Science Research (ESR). This indicator is an analysis of the most recent data available from EpiSurv provided to EHINZ by ESR in April 2023.

There has been an increased use in nucleic acid testing by laboratories for leptospirosis infection since 2016. The use of this testing method may be improving the detection of leptospirosis.

All 95% confidence intervals have been presented as error bars on graphs. Age-standardised rates presented in this factsheet take into account varying age distributions when comparing between populations.

Children aged 0-14 years have been excluded from the analysis of this surveillance report.

For additional information, see the [Metadata](#) sheet.

## References

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