

# Notifications of potentially waterborne diseases

This report presents information on how New Zealanders' health is affected by three potentially waterborne diseases (PWD): campylobacteriosis, giardiasis and cryptosporidiosis.

## Key facts

- Children aged under four years experienced much higher notification rates for all waterborne diseases covered in this surveillance report.
- The age-standardised rate of campylobacteriosis notifications was 106.2 per 100,000 people in 2023, continuing a steady decline post-2008.
- The notification rate for cryptosporidiosis was 17.2 per 100,000 people, one of the lowest reported rates since 2001.
- The notification rate for giardiasis was 16.4 per 100,000 people, the second-lowest reported rate since 2001

## Waterborne diseases and the environment

Campylobacteriosis is one of the most common infections caused by bacteria in humans, and whilst it is most notably a foodborne disease, evidence shows that outbreaks can also be attributed to water contamination (Wilson et al 2008). *Campylobacter* normally inhabit the intestine of warm-blooded animals but can cause waterborne infections resulting from water contamination from fecal run-off from farms.

Other important waterborne enteric pathogens that can be transmitted via wastewater include *Cryptosporidium* and *Giardia* (Pitkänen 2013). Cryptosporidiosis and giardiasis are infections caused by protozoal parasites and can also contaminate waterways and result in waterborne transmission of disease (Carmena 2010).

Waterborne diseases are often causative agents of gastroenteritis in humans. Although the infection can be self-limiting in most people, it can be lethal for immunocompromised individuals. Waterborne diseases can often remain in waterways outside of a human host for extended periods, making transmission through drinking and recreational water an increased risk.

#### Potentially waterborne disease notification rates

The campylobacteriosis notification rate in 2023 was 106.2 per 100,000 people (5,775 notifications), a slight decrease from the previous year, continuing a declining trend from 2008 onwards (Figure 1). The minor elevation in the rate for 2016 was due to a campylobacteriosis outbreak in Havelock North.

The large decrease in the campylobacteriosis rate leading up to 2008 has been attributed to the introduction

of food safety regulations for poultry production in 2007 and 2008 (Duncan 2014). Consequently, the decline represents a drop in the number of food-related cases. It is unlikely to represent a change in the pattern of cases contracted through contact with contaminated water.



#### Figure 1: Campylobacteriosis notification rate, 2001–2023

Note: The 95% confidence intervals for this graph are displayed as vertical bars. Source: ESR 2024

In 2023, the age-standardised notification rate for cryptosporidiosis was 17.2 per 100,000 people (770 notifications). The rate for cryptosporidiosis has been fairly volatile, currently at one of the lowest levels since 2001. A few years previously, the rate in 2018 was the highest in the last 20 years of data (Figure 2).

There was a notable drop in the rate of giardiasis between 2019 and 2020 after a period of no real change, leading to the lowest rate this century in 2022: 13.9 per 100,000 people. In 2023, the rates of giardiasis rose slightly to 16.4 per 100,000 (based on 89 cases), bringing an end to the consecutive years of decreases.

#### Figure 2: Cryptosporidiosis and giardiasis notification rates, 2001–2023



Note: The 95% confidence intervals for this graph are displayed as vertical bars. Source: ESR 2024

#### Young children have the highest notified rates of all waterborne diseases

In 2023, the highest notification rates for campylobacteriosis, giardiasis and cryptosporidiosis occurred in children aged 0-4 years (Figures 3a-c). This is in keeping with results for previous years. Young children often have higher levels of risk exposure for potentially waterborne disease (PWD) through being less disciplined in managing their hand and food hygiene practices (e.g. handwashing) and by having less developed immune systems (Sinclair, Jones and Gerba 2009).



Figure 3a: Notification rates for campylobacteriosis, by age group, 2023

Note: The 95% confidence intervals for this graph are displayed as vertical bars. Source: ESR 2024





Crude rate (per 100,000)

Note: The 95% confidence intervals for this graph are displayed as vertical bars. The rate for the 85+ age group is suppressed due to insufficient numbers of cases to calculate a rate (<5). Source: ESR 2024

#### Figure 3c: Notification rates for giardiasis, by age group, 2023



Crude rate (per 100,000)

Note: The 95% confidence intervals for this graph are displayed as vertical bars. The rate for the 85+ age group is suppressed due to insufficient numbers of cases to calculate a rate (<5). Source: ESR 2024

#### Campylobacteriosis notifications are higher in males

In 2023, the age-standardised notification rate for campylobacteriosis was notably higher for males (119.1 per 100,000) than females (93.1 per 100,000). There were differences by sex for giardiasis (for which males were higher) and cryptosporidiosis (females higher) as well, but these were much smaller (Figure 4).



## Notification rates for campylobacteriosis, cryptosporidiosis, and giardiasis, by

Note: The 95% confidence intervals for this graph are displayed as vertical bars. Source: ESR 2024

## People of European/Other ethnicity have the highest notification rates

People of European/Other ethnicity had the highest age-standardised notification rate for all three potentially waterborne diseases in 2021 (Figure 5).



#### Notification rates of potentially waterborne disease, by ethnic group, 2023 Figure 5:

Note: The 95% confidence intervals for this graph are displayed as vertical bars. Source: ESR 2024

#### Campylobacteriosis rates appear higher in less deprived areas

In 2023, people living in less socioeconomically deprived areas (quintile 1) had higher notification rates of campylobacteriosis compared to those living in more deprived areas (quintile 5) (Figure 6). This may be due to people living in more deprived areas finding it more challenging to access healthcare than people in less deprived areas, resulting in greater under-reporting of cases among the former group (Ministry of Health 2023). Cryptosporidiosis and giardiasis notification rates did not appear to vary greatly between the different deprivation quintiles.



Note: The 95% confidence intervals for this graph are displayed as vertical bars. Source: ESR 2024

#### People living in rural areas have higher notification rates of PWD

For all three diseases, people living in rural areas continued to have higher notification rates of PWDs than people living in more urbanised areas during 2023 (Figure 7). In particular, the cryptosporidiosis notification rate was almost five times as high in major urban areas (standardised rate ratio 4.7; 95%CI 3.8–5.6). The campylobacteriosis notification rate in rural areas was more than double that of major urban areas (standardized rate ratio 2.3; 95%CI 2.2–2.5).



Note: The 95% confidence intervals for this graph are displayed as vertical bars. Source: ESR 2024  $\,$ 

#### Rates of waterborne disease by district

In 2023, high rates could be found in South Canterbury (246.0 per 100,000 people), Wairarapa (219.6 per 100,000 people), West Coast (206.7 per 100,000 people), and Taranaki (199.1 per 100,000) districts. Lower rates of campylobacteriosis notifications were in the Auckland (85.6 per 100,000 people), Counties Manukau (79.0 per 100,000 people), and Capital & Coast (80.6 per 100,000 people) districts (Figure 8).

Taranaki (49.8 per 100,000 people) and South Canterbury (38.6 per 100,000 people) districts had the highest rates of cryptosporidiosis, while the Counties Manukau (6.3 per 100,000 people) and Nelson/Marlborough districts (6.1 per 100,000 people) had the lowest rates (Figure 9).

Giardiasis rates were also broadly similar across most districts, with some elevated rates occurring across the central North Island and the Wairarapa districts (Figure 10). The Tairāwhiti district had the most elevated rate of notifications at 52.1 per 100,000 people.

The distribution of rates for all diseases and districts is broadly consistent with previous years. See earlier editions of this report (linked at the end of the document) for more information.

Figure 8: Notification rates of campylobacteriosis, by district, 2023



Crude rate (per 100,000)

Note: The 95% confidence intervals for this graph are displayed as vertical bars. Source: ESR 2024

#### Figure 9: Notification rates of cryptosporidiosis, by district, 2023



Crude rate (per 100,000)

Note: The 95% confidence intervals for this graph are displayed as vertical bars. Rates for Tairāwhiti and Whanganui are suppressed due to a low count of cases (<5) Source: ESR 2024

Figure 10: Notification rates of giardiasis, by district, 2023



Note: The 95% confidence intervals for this graph are displayed as vertical bars. Rates for West Coast and South Canterbury are suppressed due to a low count of cases (<5) Source: ESR 2024

#### Data for this indicator

This indicator analyses the most recent EpiSurv notification data provided by the Institute for Environmental Science and Research (ESR) to EHINZ in October 2024.

Notifications exclude cases where the person was overseas during the incubation period. Notifications only cover those who visited a GP or hospital for treatment and are likely to underestimate the actual rate of disease in the population. Risk factor data for cases that reported contact with untreated drinking water or recreational water are available in separate surveillance reports.

'Crude rates' presented in this factsheet do not consider varying age distributions when comparing between populations, whilst 'Age-standardised' rates take into account the effect of varying age distributions. For additional information, see the <u>Metadata</u> sheet.

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#### Author

The author of this report is Patrick Hipgrave, ehinz@massey.ac.nz

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