Notifications of waterborne diseases with recreational water as a risk factor

This surveillance report presents information on notifications of campylobacteriosis, giardiasis, and cryptosporidiosis, for which contact with recreational water (eg lakes, rivers or the sea) was recorded as a risk factor. The percentage of cases with risk factor information reported is also included.

Key facts

- In 2023, there were 103 notifications of campylobacteriosis, 26 notifications of cryptosporidiosis, and 35 notifications of giardiasis where contact with recreational water (eg lakes, rivers or the sea) was recorded as a risk factor. However, these figures are highly likely to be underestimates.
- In 2019–23, none of the twenty health districts had sufficient risk factor information for campylobacteriosis notifications to allow a reliable calculation of a crude rate of disease where recreational water contact was a risk factor. Five districts had enough data for both cryptosporidiosis and giardiasis.
- Notifications submitted for the Auckland Regional Public Health Service (covering Waitematā, Auckland and Counties Manukau districts) during 2019-23 contained very little risk factor information.

About waterborne diseases & risk factor information

Campylobacteriosis, cryptosporidiosis, and giardiasis are gastrointestinal diseases caused by infection with the *Campylobacter* bacteria, *Cryptosporidium* parasite, and *Giardia* parasite, respectively. Recreational water bodies (ie. lakes, rivers and seas) are common transmission routes for giardiasis and cryptosporidiosis, while most campylobacteriosis cases are contracted through food-borne infection - particularly raw chicken.

Notifications of these diseases submitted to ESR by public health services should also include risk factor information. This information includes details of possible sources from which the individual could have contracted the disease – but not the confirmed source. The percentage of notifications that had completed risk factor information (the 'completion rate') varies greatly across New Zealand. To account for the data quality issues this causes, EHINZ uses a completion rate of 70% as an acceptable value that should be matched or exceeded to allow sufficient data quality for use in our analyses.

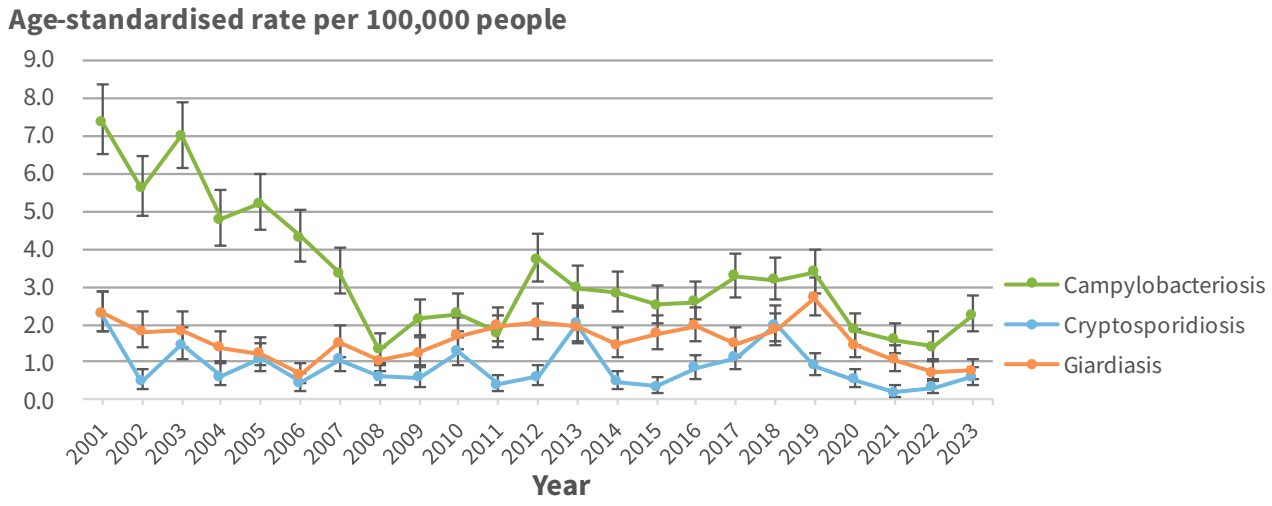
Declining rates of disease do not tell the whole story

In 2023, there were 103 notifications of campylobacteriosis, 26 notifications of cryptosporidiosis, and 35 notifications of giardiasis where contact with recreational water was recorded as a risk factor.

Rates of campylobacteriosis involving recreational water initially declined from 2001 to 2008 and stayed relatively low through the 2010s and beyond (Figure 1). This reflects the introduction of new food safety standards for poultry. Meanwhile, notification rates of cryptosporidiosis and giardiasis mainly remained unchanged.

The COVID-19 pandemic appears to have had a dampening effect on notification rates, possibly caused by fewer people venturing into the outdoors to swim. However, other factors are likely to have been contributing to the low rates (for example, the limited collection of risk factor information in a stressed public health system).

Figure 1: Notification rates of potentially waterborne diseases with recreational water as a risk factor, 2001–23



Source: ESR 2024

Notifications involving recreational water are rare

In 2023, notifications of gastrointestinal infection where contact with recreational water was listed as a risk factor comprised less than 5% of all notifications of the three diseases reported here (Table 1). However, only one-third of notifications overall (36.8%) provided risk factor information.

If the cases where no risk factor information was recorded are divided up using the same proportions as in the 'yes/no' columns in the table below, there would be an additional 215 cases of campylobacteriosis, 20 of cryptosporidiosis and 48 of giardiasis with a potential connection to recreational water.

Though these are still low numbers in the context of the total number of gastrointestinal infections recorded, substantially more cases with potential links to recreational water may have passed through the health system than were counted.

Table 1: Breakdown of notifications by risk factor status, 2023

Disease	Notifications with recreational water as a risk factor					Risk factor completion		
	Yes	No	Total stated	Unknown/ missing	Total cases	Completion rate (%)*	Percentage with reported recreational water contact (among total stated)	Percentage with reported recreational water contact (among total cases)
Campylobacteriosis	100	1,799	1,899	3,876	5,775	32.9%	5.3%	1.7%
Cryptosporidiosis	25	418	443	327	770	57.5%	5.6%	3.2%
Giardiasis	35	327	362	447	809	44.7%	9.7%	4.3%
Total	**160**	**2,544**	**2,704**	**4,650**	**7,354**	**36.8%**	**5.9%**	**2.2%**

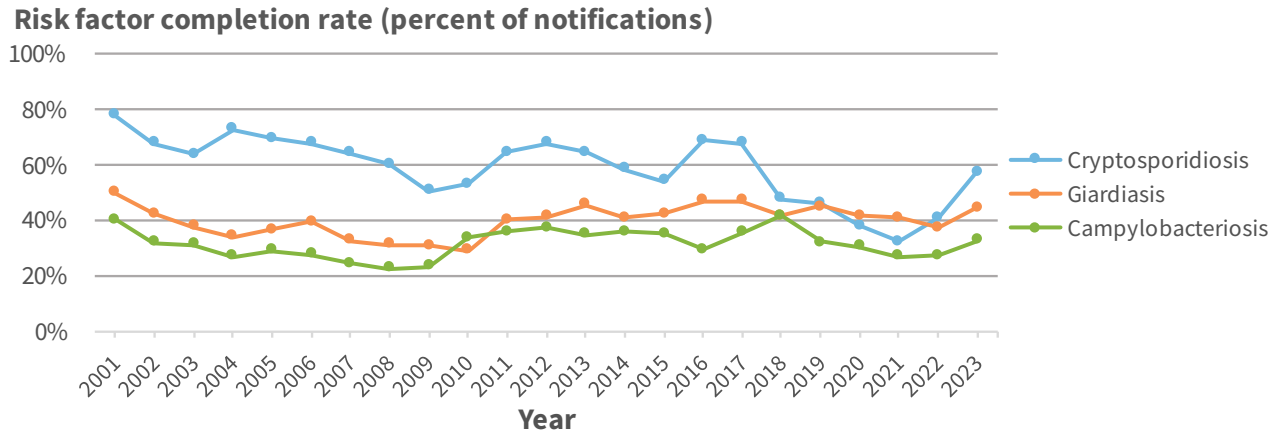
Note: * Completion rate = percentage of notifications with risk factor information provided.

Source: ESR 2024

Risk factor completion rates remain low

Risk factor completion rates for all three diseases reported here have always been low, typically less than 50% in the case of campylobacteriosis and giardiasis. (Figure 2). The COVID-19 pandemic appears to have had little effect on completion rates, as the rates in 2020 are not much different to the previous year. There is some indication of a post-COVID rebound in 2022–23, though more time is needed to see whether this will translate into a longer-term trend.

Figure 2: Recreational water risk factor completion rates for potentially waterborne disease, 2001–23



Note: Completion rate = percentage of notifications with risk factor information provided.
Source: ESR 2024

Completion rates vary by health district

In 2019-23, most districts produced fewer complete notifications than during the pre-COVID period EHINZ last reported on (2015–19). Table 2 below sets out the completion rate for each period, arranged by public health service (PHS) and health district.

Public health services are responsible for reporting risk factor information to ESR. The three districts covered by the Auckland Regional Public Health Service (ARPHS) – Waitematā, Auckland, and Counties Manukau - all had much less risk factor information in their notifications than any other district. The public health service associated with each district is included in the table below.

Table 2: Risk factor completion rates in 2015–19 and 2019–23, by PHS and district

Primary PHS	District	Campylobacteriosis		Cryptosporidiosis		Giardiasis	
		2015–19	2019-23	2015–19	2019-23	2015–19	2019-23
Ngā Tai Ora – Public Health Northland	Northland	77.3%	63.0%	84.9%	76.2%	72.9%	74.3%
Auckland Regional Public Health Service	Waitematā	7.0%	1.6%	17.3%	1.1%	0.1%	0.2%
	Auckland	5.6%	1.8%	15.1%	1.8%	0.4%	0.5%
	Counties Manukau*	7.0%	1.3%	18.9%	1.2%	0.6%	0.2%
Waikato Public Health	Waikato	26.0%	37.0%	84.7%	50.5%	62.8%	58.3%
Toi Te Ora Public Health	Lakes	51.8%	46.6%	94.0%	83.6%	85.0%	87.5%
	Bay of Plenty	50.5%	41.6%	90.1%	81.4%	87.9%	80.9%
Hauora Tairāwhiti	Tairāwhiti	38.0%	41.9%	68.2%	48.6%	21.4%	61.5%
Hawke's Bay Public Health	Hawke's Bay	23.6%	49.7%	59.8%	52.5%	8.8%	55.3%
Taranaki Public Health	Taranaki	26.8%	14.5%	86.6%	86.6%	93.4%	84.5%
MidCentral Public Health Service	MidCentral	84.7%	62.7%	90.0%	71.0%	81.8%	71.2%
	Whanganui	54.3%	44.5%	85.1%	55.6%	77.9%	47.2%
Regional Public Health	Capital and Coast**	56.1%	54.3%	79.2%	62.2%	60.1%	58.9%
	Hutt Valley	58.3%	54.6%	79.3%	55.6%	65.9%	56.7%
	Wairarapa	53.3%	54.1%	84.7%	75.0%	65.4%	58.8%
Nelson Marlborough Public Health Service	Nelson Marlborough	49.7%	34.4%	91.5%	66.2%	79.3%	65.1%
Community and Public Health	West Coast	83.8%	56.5%	91.7%	57.7%	45.8%	63.2%
	Canterbury	42.3%	36.0%	42.3%	39.6%	45.4%	39.9%
	South Canterbury	46.6%	29.6%	50.0%	28.9%	78.4%	26.6%
Public Health South	Southern	49.2%	35.8%	66.2%	50.2%	84.9%	44.8%
New Zealand		**34.9%**	**34.9%**	**30.2%**	**56.4%**	**43.6%**	**39.2%**

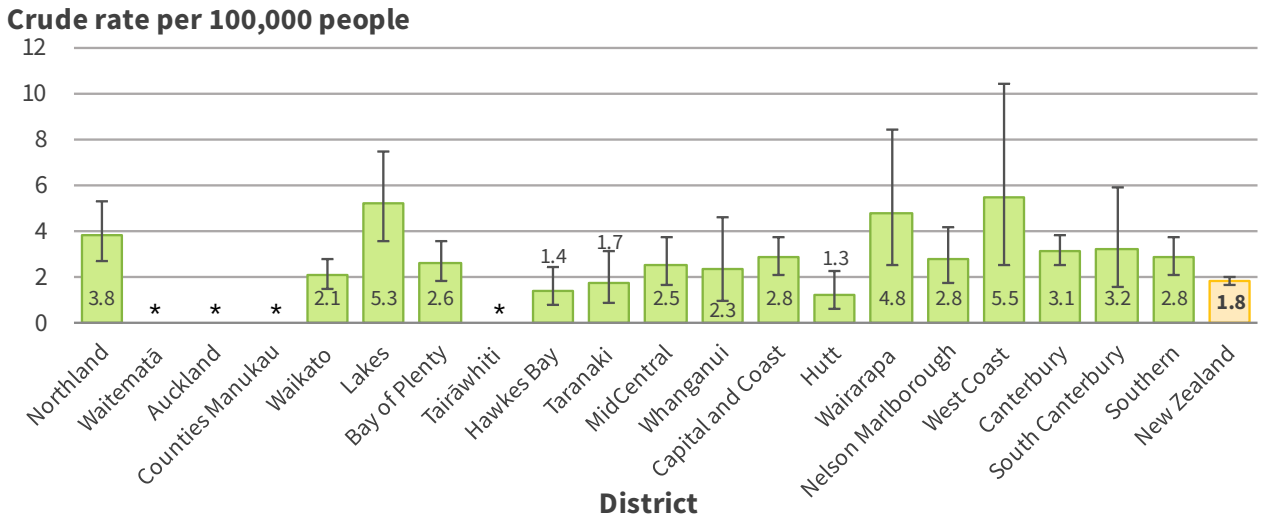
Notes: * and **: these districts have very small geographical overlaps between two PHS. Counties Manukau district is partially within the area of Waikato PHS, and Capital and Coast district has a small element within the region of MidCentral PHS.

Source: ESR 2024

Campylobacteriosis notification and completion rates

Crude notification rates for campylobacteriosis where recreational water contact was reported were fairly consistent across the country. West Coast, Lakes, and Wairarapa districts had high rates, although there were wide confidence intervals which indicates potential large variability in the rate due to the small number of cases.

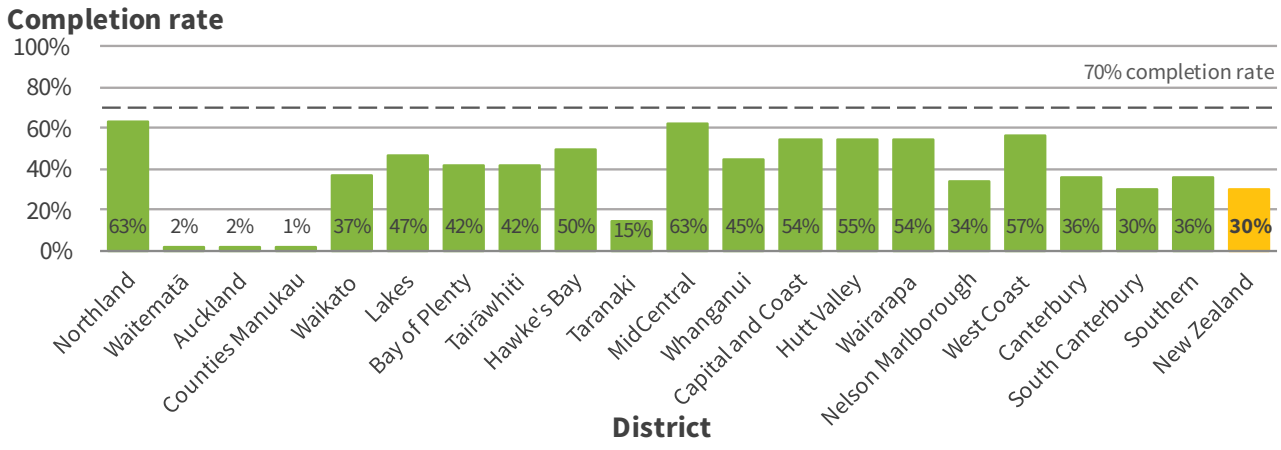
Figure 3: Notification rates of campylobacteriosis with recreational water as a risk factor, by district, 2019-23



Note: * - The rate for these districts is suppressed due to a lack of notifications that declared recreational water contact as a risk factor (<5 over the five-year period). Due to varying risk factor completion rates, readers should not compare district rates. Bars with a light fill indicate districts where completion rates were lower than 70%.
Source: ESR 2024

No health district had enough risk factor information for a reliable calculation of the disease notification rate where contact with recreational water was a risk factor. The MidCentral and Northland districts came closest, with 63% of all notifications containing risk factor information (Figure 4).

Figure 4: Risk factor completion rates for notifications of campylobacteriosis, 2019–23

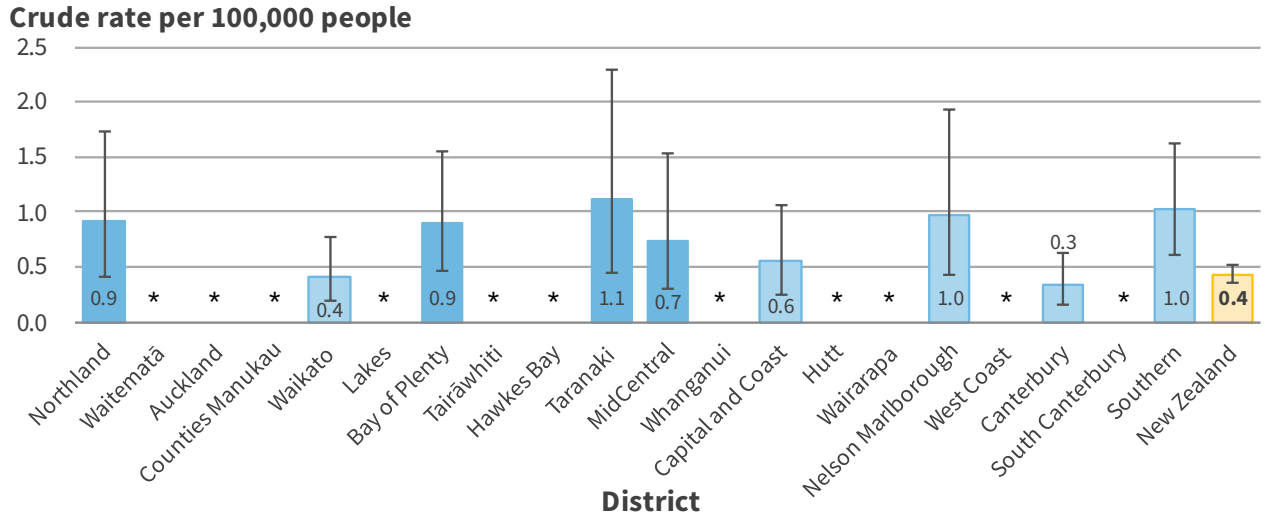


Source: ESR 2024

Cryptosporidiosis notification and completion rates

Small numbers of cryptosporidiosis notifications with risk factor information in 2019–23 led to suppressed rates for most districts. Of those where rates could be calculated, there was no clear pattern.

Figure 5: Notification rates of cryptosporidiosis with recreational water as a risk factor, by district, 2019–23

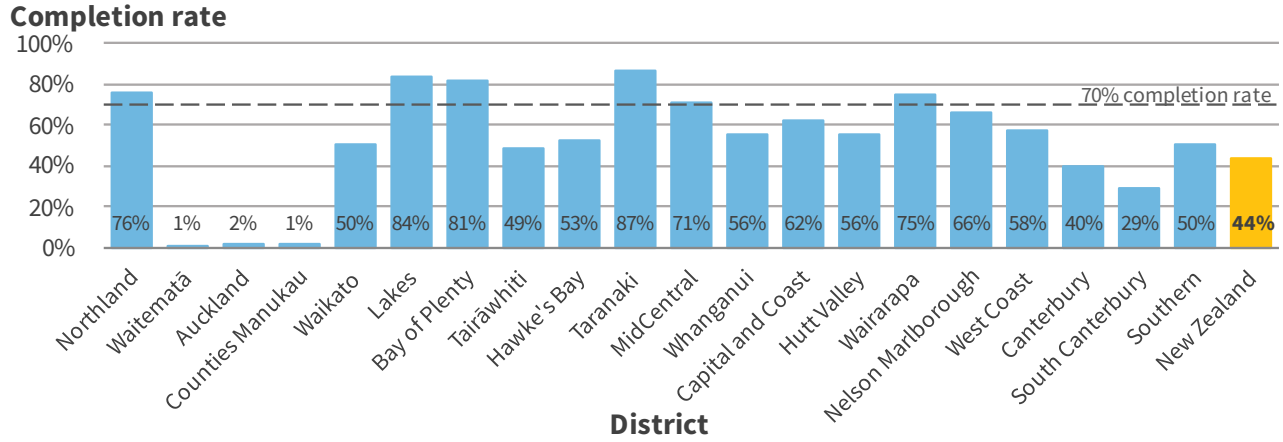


Note: * - The rate for these districts is suppressed due to a lack of notifications that declared recreational water contact as a risk factor (<5 over the five-year period). Due to varying risk factor completion rates, readers should not compare district rates. Bars with a light fill indicate districts where completion rates were lower than 70%

Source: ESR 2024

Risk factor completion rates for cryptosporidiosis notifications were marginally better than for campylobacteriosis, with 5 out of 20 DHBs exceeding a completion rate of 70% between 2019–23 (Figure 6). The Taranaki district had the highest completion rate by a small margin. As above, the districts in the Auckland region (ARPHS) once again had the lowest completion rates (1-2%).

Figure 6: Risk factor completion rates for notifications of cryptosporidiosis, 2019–23

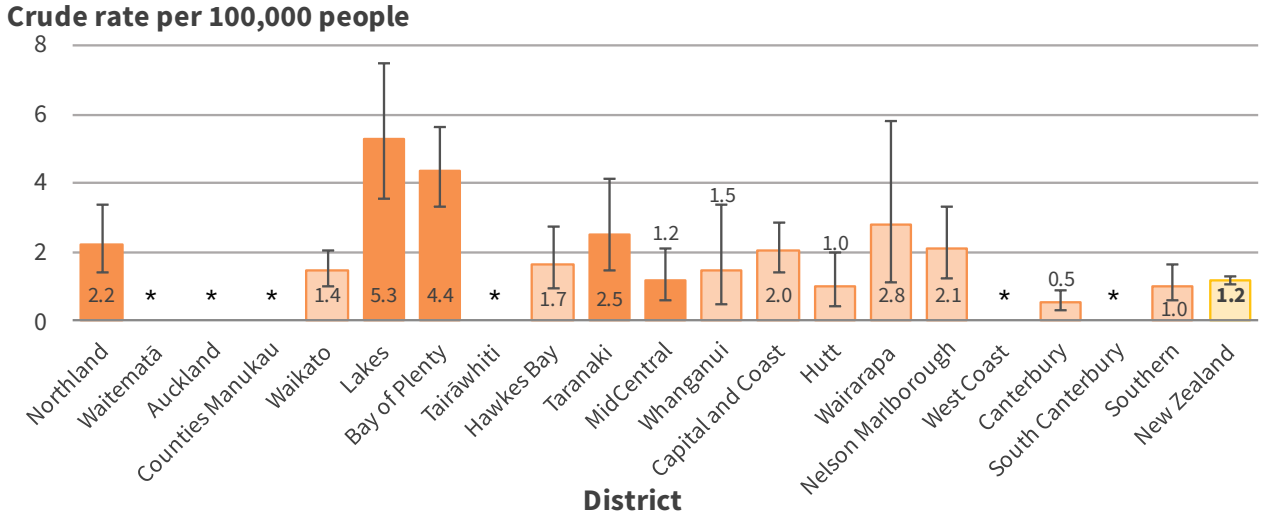


Source: ESR 2024

Giardiasis notification and completion rates

Lakes and Bay of Plenty districts had high giardiasis notification rates with recreational water as a risk factor (Figure 7), and also had acceptable risk factor completion rates (Figure 8).

Figure 7: Notification rates of giardiasis with recreational water as a risk factor, by district, 2019–23

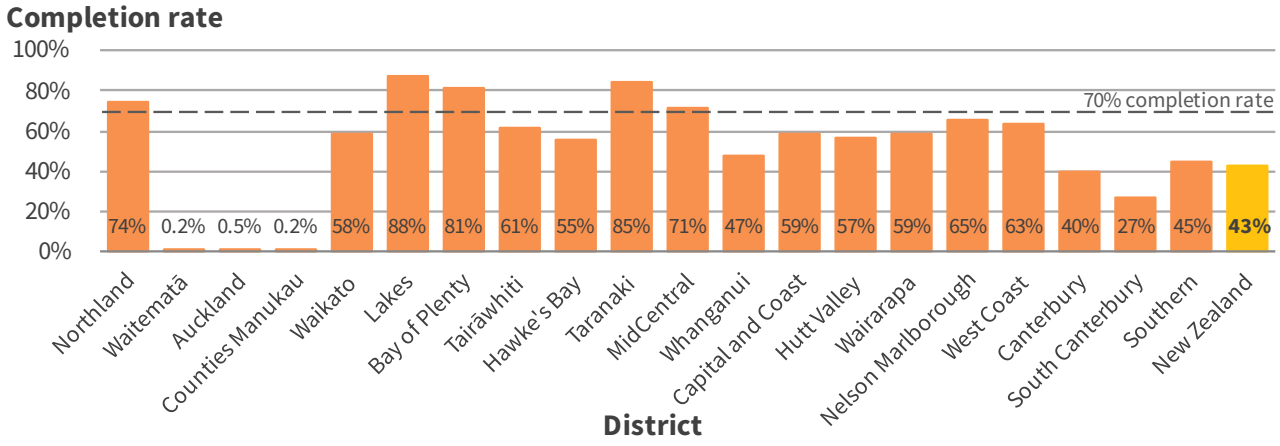


Note: * - The rate for these districts is suppressed due to a lack of notifications that declared recreational water contacts as a risk factor (<5 over the five-year period). Due to varying risk factor completion rates, readers should not compare district rates. Bars with a light fill indicate districts where completion rates were lower than 70%.

Source: ESR 2024

Risk factor completion rates for giardiasis were adequate in only five out of 20 districts, with the highest rate (88%) occurring in Lakes district (Figure 8). Once again, the Waitematā, Auckland, and Counties Manukau districts provided far less risk factor information than others, leading to suppressed disease rates in those districts.

Figure 8: Risk factor completion rates for notifications of giardiasis, 2019–23



Source: ESR 2024

Data for this indicator

This factsheet presents EpiSurv notifications from the Institute for Environmental Science and Research (ESR). 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 therefore likely to underestimate the true rate of disease in the population.

Public health services are responsible for reporting risk factor information for each case, including whether the affected person was in contact with 'recreational water' (i.e. a river, lake or sea) during the incubation period. Multiple risk factors can exist for a single case, and risk factor information is not always collected for every case. Given that many notification rates are based on incomplete information (low completion rates), the notification rates should be treated with caution and, in most cases, as an underestimate.

All 95% confidence intervals have been presented as error bars on graphs. However, confidence intervals do not account for the completion rates of risk factor information for cases in a given year or district. Notification rates and confidence intervals also do not account for under-ascertainment; that is, those cases in the community who did not visit a healthcare provider for treatment and, therefore did not get included in the notification statistics. Therefore, the notification rates and confidence intervals should also be interpreted with caution.

For additional information, see the Metadata sheet.

References

ESR. 2017. *Notifiable Diseases in New Zealand: Annual Report 2016*. Porirua: Institute of Environmental Science and Research. Porirua: Institute of Environmental Science and Research Limited

ESR. 2024. *Notifiable diseases EpiSurv data extraction*. Porirua: Institute of Environmental Science and Research Limited (Personal communication with ESR Senior Analysts).

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Author

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

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