

Notifications of campylobacteriosis, giardiasis and cryptosporidiosis with recreational water as a risk factor, 2001–2016

HIGHLIGHTS

- In 2016, there were 104 campylobacteriosis notifications, 78 giardiasis notifications and 30 cryptosporidiosis notifications with a reported risk factor of contact with recreational water.
- Since 2001, completion rates for risk factor information for potentially water-borne diseases have generally been low, particularly for campylobacteriosis. In 2012–16, only 4 of the 20 District Health Boards (DHBs) had risk factor information on recreational water contact for at least 70% of notifications of campylobacteriosis. For giardiasis, this standard was met by 13 DHBs, while for cryptosporidiosis, this standard was met by 15 DHBs.
- In 2012–16, the following District Health Boards (DHBs) had high rates of campylobacteriosis, giardiasis and/or cryptosporidiosis with a risk factor of contact with recreational water: West Coast, Tairāwhiti, Lakes and Hawke’s Bay.



How water-borne diseases relate to environmental health

Water-borne diseases are, by definition, transmitted by ingesting contaminated water. Campylobacteriosis, giardiasis and cryptosporidiosis are gastrointestinal diseases caused by infection with the *Campylobacter* bacteria, *Giardia* parasite and *Cryptosporidium* parasite respectively. Contact with contaminated recreational water contact is one source of transmission of these diseases. Other sources of transmission include contact with drinking water, farm animals, sick animals, faecal matter, or other symptomatic people; and eating contaminated food.

This factsheet presents data on notifications for campylobacteriosis, giardiasis and cryptosporidiosis with a reported risk factor of contact with recreational water during the incubation period. Additional data is available in the Appendices. The following factsheets are also available: all notifications of these diseases, and for notifications with a risk factor of consuming untreated drinking water.

Data for this indicator

Data for this indicator are for 2001–2016, and come from the EpiSurv surveillance database from ESR. Risk factor information, about whether the case came in contact with recreational water (river, lake or sea) during the incubation period, was collected by Public Health Units (PHUs). Notifications have excluded cases where the person was overseas during the incubation period.

The data in this factsheet should be interpreted with caution, for several reasons. Firstly, the completion rates for the risk factor information tend to be lower than a minimum quality standard of 70% of cases, which limits analysis of notification rates. Information is therefore presented about completion rates of risk factor information, as well as notification rates for cases coming in contact with recreational water during the incubation period. Secondly, even if someone reported contact with recreational water during the incubation period, it does not mean that contaminated recreational water was the confirmed source of infection. Thirdly, notifications only include those people who visited a GP or hospital for treatment, and notification rates are therefore likely to underestimate the true rate of disease in the population. 95% confidence intervals show the imprecision due to random variation, but not due to underreporting.

Over 200 notifications of potentially water-borne diseases reported contact with recreational water in 2016

In 2016, there were 212 notifications of campylobacteriosis, giardiasis and cryptosporidiosis that reported contact with recreational water during the incubation period (Table 1). This comprised:

- 104 campylobacteriosis notifications
- 78 giardiasis notifications
- 30 cryptosporidiosis notifications.

This represented 4–5% of campylobacteriosis and cryptosporidiosis notifications where risk factor information was reported, and 12% of giardiasis notifications. However, risk factor information was collected for only 30% of campylobacteriosis notifications, 47% of giardiasis notifications, and 69% of cryptosporidiosis notifications. Risk factor completion rates varied substantially by DHB.

Table 1: Number of notifications by reported contact with recreational water, 2016

Disease	Contact with recreational water						Percent of notifications with risk factor information collected
	Yes	No	Total (stated)	Percent with risk factor (among total stated)	Unknown	Total	
Campylobacteriosis	104	2019	2123	4.9%	5050	7173	30%
Giardiasis	78	573	651	12.0%	728	1379	47%
Cryptosporidiosis	30	634	664	4.5%	298	962	69%
Total	212	3226	3438	6.2%	6076	9514	45%

Source: EpiSurv data, ESR

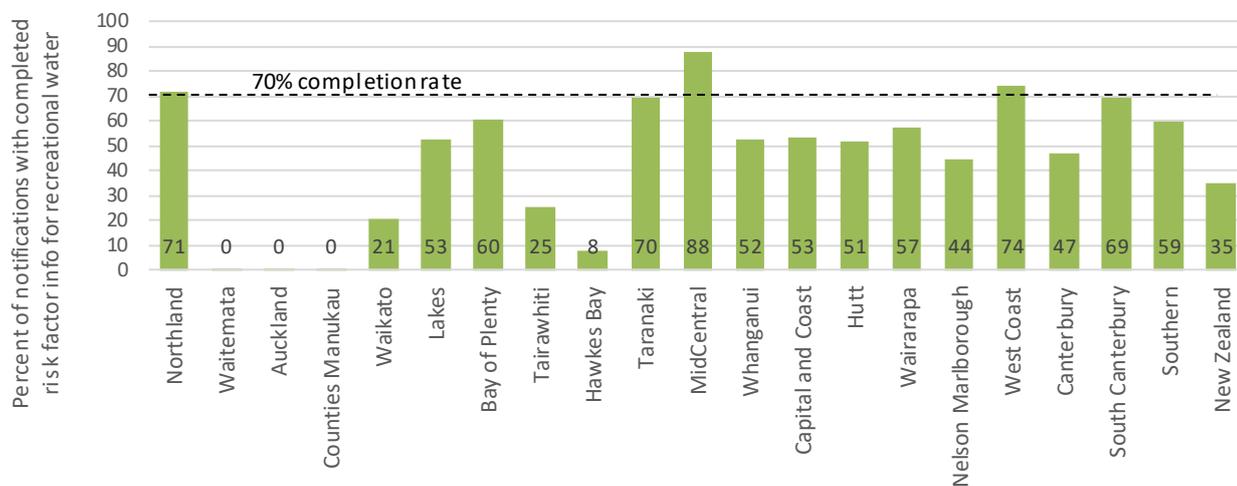
Contact with recreational water as a risk factor

This section presents notification data by disease and District Health Board, for the risk factor of contact with recreational water. Some DHBs have reasonable data quality levels, which enables relatively robust notification rates to be calculated by DHB.

Campylobacteriosis notifications had reasonable completion rates for recreational water information for a few DHBs

Completion rates for risk factor information for campylobacteriosis notifications were good for a few DHBs in 2012–16. In particular, completion rates were highest in MidCentral (88%), West Coast (74%), Northland (71%), Taranaki (70%) and South Canterbury (69%) DHBs (Figure 1).

Figure 1: Completion rate for campylobacteriosis notifications (percent of notifications with completed risk factor information about contact with recreational water, %), by DHB, 2012–16

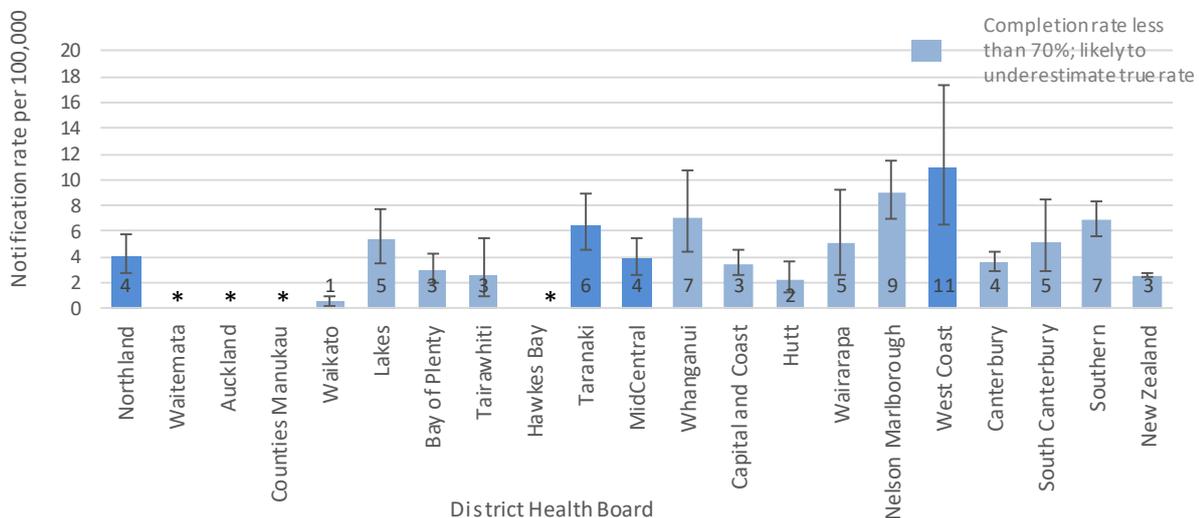


Source: EpiSurv data, ESR

West Coast DHB had the highest rate of campylobacteriosis with recreational water exposure

In 2012–16, West Coast DHB had the highest notification rate for campylobacteriosis with a risk factor of recreational water contact (Figure 2). Nelson Marlborough DHB also had a somewhat higher notification rate over this time period; this DHB also had a relatively low completion rate (44%), meaning the notification rate is likely to be underestimated.

Figure 2: Notification rate of campylobacteriosis with contact with recreational water, by DHB, 2012–16 (crude rate per 100,000)



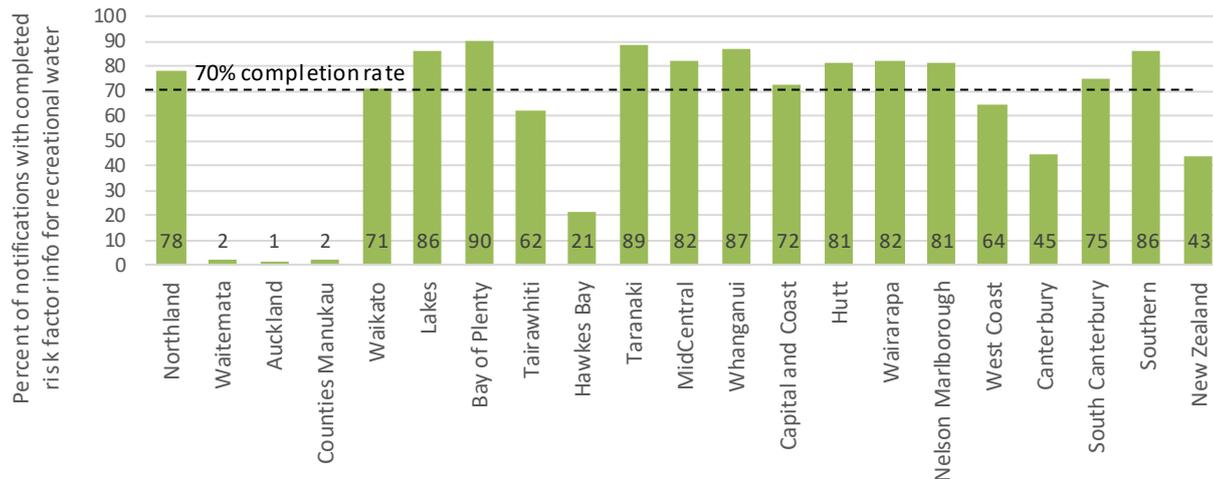
Source: EpiSurv data, ESR

Contact with recreational water as a risk factor

Giardiasis notifications had reasonable completion rates in many DHBs

Completion rates for risk factor information for giardiasis notifications were relatively good for most DHBs in 2012–16 (Figure 3). Over half of the DHBs (13 out of 20) had risk factor information about contact with recreational water for at least 70% of giardiasis notifications.

Figure 3: Completion rate for giardiasis notifications (percent of notifications with completed risk factor information about contact with recreational water, %) by DHB, 2012–16

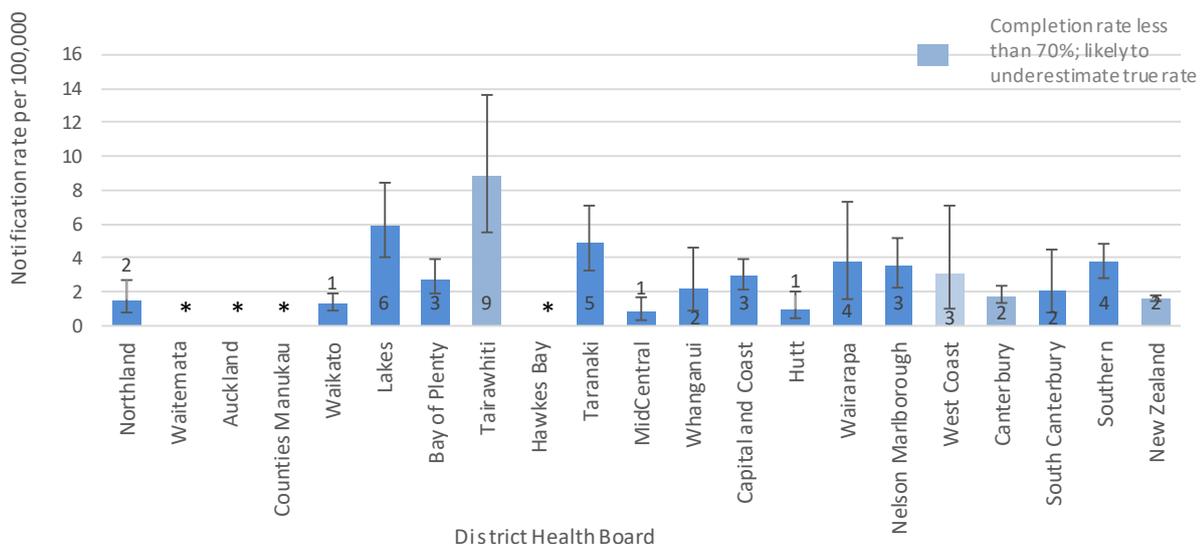


Source: EpiSurv data, ESR

Tairāwhiti DHB had the highest giardiasis notification rate with recreational water contact

Notification rates for giardiasis with a risk factor of recreational water contact were highest in Tairāwhiti DHB in 2012–16 (Figure 4). The Tairāwhiti DHB estimate, although based on a relatively low completion rate (62%), was higher than usual due to likely ascertainment bias.

Figure 4: Notification rate of giardiasis with contact with recreational water, by DHB, 2012–16 (crude rate per 100,000)



Note: An asterisk (*) shows the rate has been suppressed due to counts less than five.

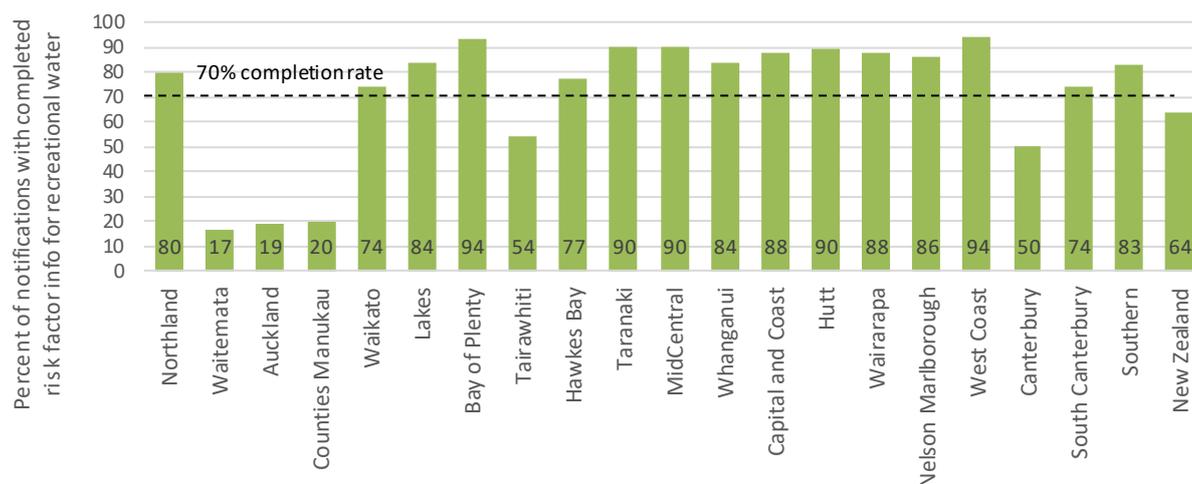
Source: EpiSurv data, ESR

Contact with recreational water as a risk factor

Cryptosporidiosis notifications had good completion rates for risk factor information in most DHBs

Completion rates for risk factor information for cryptosporidiosis notifications were good for most DHBs in 2012–16 (Figure 5). Many DHBs had risk factor information on contact with recreational water for 85–90% of cryptosporidiosis notifications. This improves the reliability of notification rate estimates in these DHBs.

Figure 5: Completion rate for cryptosporidiosis notifications (percent of notifications with completed risk factor information about contact with recreational water, %), by DHB, 2012–16

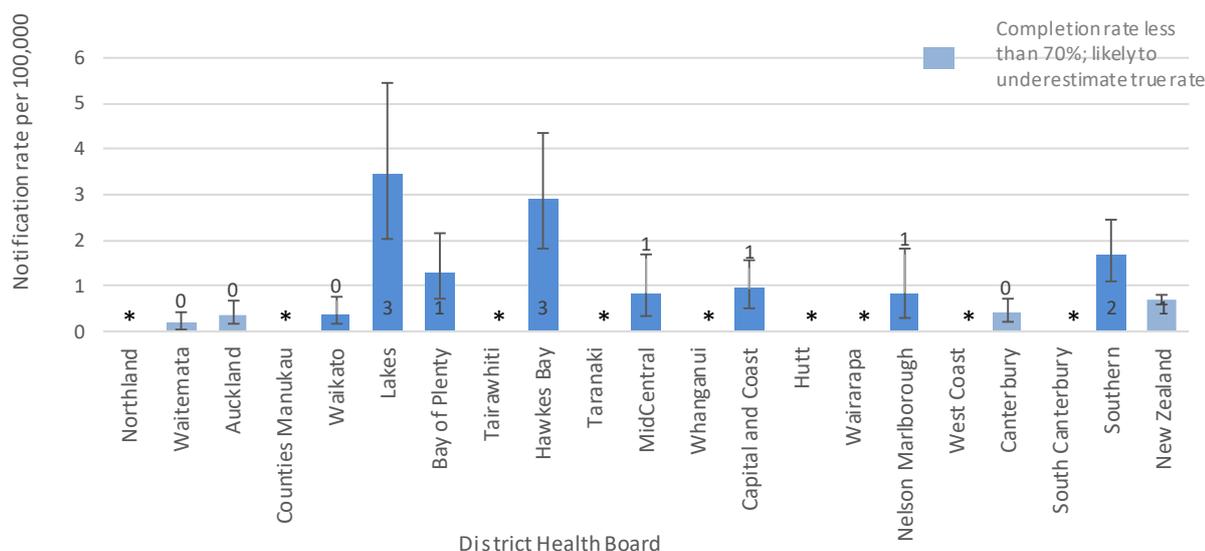


Source: EpiSurv data, ESR

Lakes and Hawke’s Bay DHBs had the highest cryptosporidiosis notification rates with contact with recreational water

The highest notification rate for cryptosporidiosis with a risk factor of contact with recreational water was in Lakes DHB, followed by Hawke’s Bay DHB (Figure 6).

Figure 6: Notification rate of cryptosporidiosis with contact with recreational water, by DHB, 2012–16 (crude rate per 100,000)



Note: An asterisk (*) shows the rate has been suppressed due to counts less than five.

Source: EpiSurv data, ESR

For more DHB data for 2016, and data for national trends over time, see the Appendices.

Contact with recreational water as a risk factor

DATA SOURCES

Data for this indicator come from the EpiSurv notifications surveillance database, from ESR. The following diseases were used: campylobacteriosis, giardiasis and cryptosporidiosis. People who were overseas during the incubation period were excluded from analysis. Notifications only cover those people who visited a GP or hospital for treatment, and are therefore likely to underestimate the true rate of disease in the population.

Risk factor information has been presented in factsheets, for the risk factors of untreated water and contact with recreational water. Public Health Units are responsible for collecting risk factor information for each case, including whether the person:

- consumed untreated surface water, bore water or rain water during the incubation period
- came in contact with recreational water (a river, lake or sea), during the incubation period.

This risk factor information does not necessarily identify the confirmed source of infection, only whether a risk factor was present. Multiple risk factors can be present for a single case.

In some DHBs, high notification numbers mean that risk factor information is not collected for all cases. For this reason, this factsheet presents DHB-level information on the completion rate for risk factor information (ie the percentage of notifications that had risk factor information), as well as the notification rate for diseases where the case reported the risk factor. Given that many of the 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.

Rates have been presented per 100,000 population (or 100,000 population per year, when multiple years of data have been combined). 95% confidence intervals have been presented as error bars on graphs. The confidence intervals represent the imprecision in the data due to random variation; however they do not take into account systematic errors such as under-reporting.

See the metadata for more information about this indicator.

RELATED INDICATORS

Related environmental health indicators for recreational water and drinking-water quality respectively, available from the EHINZ website (www.ehinz.ac.nz), include:

- Notifications of potentially water-borne diseases (campylobacteriosis, giardiasis and cryptosporidiosis)
- Notifications of campylobacteriosis, giardiasis and cryptosporidiosis with untreated drinking water as a risk factor
- Number and density of livestock in New Zealand
- Number and density of dairy cattle in New Zealand
- Suitability for swimming at coastal beaches
- Suitability for swimming at freshwater beaches
- Estimated number of people with access to safe drinking water supplies

REFERENCES

ESR. (2017). *Notifiable Diseases in New Zealand: Annual Report 2016*. Porirua: Institute of Environmental Science and Research. https://surv.esr.cri.nz/PDF_surveillance/AnnualRpt/AnnualSurv/2016/2016AnnualNDReportFinal.pdf (Accessed 18 April 2018)

For more information, please contact Kylie Mason on ehnz@massey.ac.nz

Contact with recreational water as a risk factor

APPENDIX A: NOTIFICATIONS BY RISK FACTOR INFORMATION, BY YEAR

Campylobacteriosis notifications, 2001–2016

Table A1: Campylobacteriosis notifications with risk factor information about contact with recreational water, 2001–2016

Year	Number of campylobacteriosis notifications by risk factor (contact with recreational water)					Percent of notifications reporting contact with recreational water (among total stated)	Percent of notifications with completed risk factor information
	Yes	No	Total (stated)	Unknown	Total		
2001	260	3,680	3,940	5,823	9,763	6.6%	40%
2002	200	3,716	3,916	8,217	12,133	5.1%	32%
2003	263	4,265	4,528	9,907	14,435	5.8%	31%
2004	178	3,059	3,237	8,691	11,928	5.5%	27%
2005	196	3,789	3,985	9,572	13,557	4.9%	29%
2006	162	4,141	4,303	11,265	15,568	3.8%	28%
2007	126	2,952	3,078	9,417	12,495	4.1%	25%
2008	47	1,434	1,481	5,036	6,517	3.2%	23%
2009	78	1,583	1,661	5,361	7,022	4.7%	24%
2010	89	2,332	2,421	4,740	7,161	3.7%	34%
2011	68	2,265	2,333	4,138	6,471	2.9%	36%
2012	143	2,403	2,546	4,255	6,801	5.6%	37%
2013	112	2,195	2,307	4,318	6,625	4.9%	35%
2014	113	2,252	2,365	4,187	6,552	4.8%	36%
2015	98	2,011	2,109	3,869	5,978	4.6%	35%
2016	104	2,019	2,123	5,050	7,173	4.9%	30%

Giardiasis notifications, 2001–2016

Table A2: Giardiasis notifications with risk factor information about contact with recreational water, 2001–2016

Year	Number of giardiasis notifications by risk factor (contact with recreational water)					Percent of notifications reporting contact with recreational water (among total stated)	Percent of notifications with completed risk factor information
	Yes	No	Total (stated)	Unknown	Total		
2001	83	634	717	718	1,435	11.6%	50%
2002	62	540	602	810	1,412	10.3%	43%
2003	66	472	538	886	1,424	12.3%	38%
2004	52	407	459	875	1,334	11.3%	34%
2005	46	348	394	676	1,070	11.7%	37%
2006	24	396	420	636	1,056	5.7%	40%
2007	56	356	412	849	1,261	13.6%	33%
2008	38	430	468	1,021	1,489	8.1%	31%
2009	40	433	473	1,050	1,523	8.5%	31%
2010	64	471	535	1,287	1,822	12.0%	29%
2011	74	637	711	1,050	1,761	10.4%	40%
2012	80	558	638	906	1,544	12.5%	41%
2013	68	636	704	831	1,535	9.7%	46%
2014	58	572	630	911	1,541	9.2%	41%
2015	70	489	559	761	1,320	12.5%	42%
2016	78	573	651	728	1,379	12.0%	47%

Contact with recreational water as a risk factor

Cryptosporidiosis notifications, 2001–2016

Table A3: Cryptosporidiosis notifications with risk factor information about contact with recreational water, 2001–2016

Year	Number of cryptosporidiosis notifications by risk factor (contact with recreational water)					Percent of notifications reporting contact with recreational water (among total stated)	Percent of notifications with completed risk factor information
	Yes	No	Total (stated)	Unknown	Total		
2001	77	838	915	262	1,177	8.4%	78%
2002	17	609	626	297	923	2.7%	68%
2003	50	458	508	288	796	9.8%	64%
2004	21	394	415	154	569	5.1%	73%
2005	39	547	586	257	843	6.7%	70%
2006	15	455	470	224	694	3.2%	68%
2007	37	530	567	313	880	6.5%	64%
2008	21	417	438	288	726	4.8%	60%
2009	17	395	412	401	813	4.1%	51%
2010	49	432	481	420	901	10.2%	53%
2011	14	360	374	204	578	3.7%	65%
2012	22	533	555	262	817	4.0%	68%
2013	73	743	816	447	1,263	8.9%	65%
2014	16	302	318	224	542	5.0%	59%
2015	13	338	351	295	646	3.7%	54%
2016	30	634	664	298	962	4.5%	69%

Contact with recreational water as a risk factor

APPENDIX B: NOTIFICATIONS BY RISK FACTOR INFORMATION, BY DISTRICT HEALTH BOARD

Campylobacteriosis notifications, 2016

Table B1: Campylobacteriosis notifications with risk factor information about contact with recreational water, by District Health Board, 2016

District Health Board	Number of campylobacteriosis notifications by risk factor (contact with recreational water)					Percent of notifications reporting contact with recreational water (among total stated)	Percent of notifications with completed risk factor information
	Yes	No	Total (stated)	Unknown	Total		
Northland	6	189	195	74	269	3.1%	72%
Waitemata	0	1	1	752	753	0.0%	0%
Auckland	0	0	0	506	506	–	0%
Counties Manukau	0	0	0	490	490	–	0%
Waikato	5	108	113	443	556	4.4%	20%
Lakes	6	55	61	63	124	9.8%	49%
Bay of Plenty	3	108	111	117	228	2.7%	49%
Tairāwhiti	3	26	29	45	74	10.3%	39%
Hawkes Bay	1	140	141	1,182	1,323	0.7%	11%
Taranaki	6	21	27	206	233	22.2%	12%
MidCentral	2	251	253	34	287	0.8%	88%
Whanganui	5	42	47	55	102	10.6%	46%
Capital and Coast	10	206	216	146	362	4.6%	60%
Hutt	3	107	110	72	182	2.7%	60%
Wairarapa	1	30	31	37	68	3.2%	46%
Nelson Marlborough	9	71	80	81	161	11.3%	50%
West Coast	4	42	46	12	58	8.7%	79%
Canterbury	11	269	280	420	700	3.9%	40%
South Canterbury	3	75	78	70	148	3.8%	53%
Southern	26	278	304	245	549	8.6%	55%
New Zealand	104	2,019	2,123	5,050	7,173	4.9%	30%

Giardiasis notifications, 2016

Table B2: Giardiasis notifications with risk factor information about contact with recreational water, by District Health Board, 2016

District Health Board	Number of giardiasis notifications by risk factor (contact with recreational water)					Percent of notifications reporting contact with recreational water (among total stated)	Percent of notifications with completed risk factor information
	Yes	No	Total (stated)	Unknown	Total		
Northland	3	42	45	10	55	6.7%	82%
Waitemata	0	14	14	174	188	0.0%	7%
Auckland	2	7	9	160	169	22.2%	5%
Counties Manukau	1	10	11	172	183	9.1%	6%
Waikato	7	75	82	23	105	8.5%	78%
Lakes	5	27	32	6	38	15.6%	84%
Bay of Plenty	2	48	50	3	53	4.0%	94%
Tairāwhiti	18	46	64	8	72	28.1%	89%
Hawkes Bay	3	32	35	32	67	8.6%	52%
Taranaki	8	23	31	6	37	25.8%	84%
MidCentral	1	28	29	5	34	3.4%	85%
Whanganui	1	13	14	2	16	7.1%	88%
Capital and Coast	8	58	66	28	94	12.1%	70%
Hutt	0	21	21	7	28	0.0%	75%
Wairarapa	0	6	6	3	9	0.0%	67%
Nelson Marlborough	1	26	27	5	32	3.7%	84%
West Coast	4	1	5	1	6	80.0%	83%
Canterbury	7	44	51	61	112	13.7%	46%
South Canterbury	2	8	10	6	16	20.0%	63%
Southern	5	44	49	16	65	10.2%	75%
New Zealand	78	573	651	728	1379	12.0%	47%

Contact with recreational water as a risk factor

Cryptosporidiosis notifications, 2016

Table B3: Cryptosporidiosis notifications with risk factor information about contact with recreational water, by District Health Board, 2016

District Health Board	Number of cryptosporidiosis notifications by risk factor (contact with recreational water)					Percent of notifications reporting contact with recreational water (among total stated) (%)	Percent of notifications with completed risk factor information (%)
	Yes	No	Total (stated)	Unknown	Total		
Northland	2	88	90	16	106	2.2%	85%
Waitemata	4	59	63	67	130	6.3%	48%
Auckland	7	37	44	40	84	15.9%	52%
Counties Manukau	1	47	48	40	88	2.1%	55%
Waikato	1	84	85	30	115	1.2%	74%
Lakes	2	14	16	1	17	12.5%	94%
Bay of Plenty	0	14	14	0	14	0.0%	100%
Tairāwhiti	0	7	7	5	12	0.0%	58%
Hawkes Bay	1	13	14	9	23	7.1%	61%
Taranaki	0	39	39	4	43	0.0%	91%
MidCentral	0	47	47	6	53	0.0%	89%
Whanganui	1	15	16	4	20	6.3%	80%
Capital and Coast	2	50	52	4	56	3.8%	93%
Hutt	0	10	10	1	11	0.0%	91%
Wairarapa	0	14	14	4	18	0.0%	78%
Nelson Marlborough	1	17	18	3	21	5.6%	86%
West Coast	0	2	2	0	2	0.0%	100%
Canterbury	3	40	43	44	87	7.0%	49%
South Canterbury	0	9	9	6	15	0.0%	60%
Southern	5	28	33	14	47	15.2%	70%
New Zealand	30	634	664	298	962	4.5%	69%