Information topic	Details
Factsheet name	**Gastrointestinal diseases linked to climate change**
Domain and topic	Climate change: Health effects related to climate change
Indicator definition and units	Number of notifications of cases of salmonellosis, cryptosporidiosis giardiasis and campylobacteriosis, excluding cases that were overseas during the incubation period
Data source	- Institute of Environmental Science and Research Ltd. (ESR). National Database of notifiable diseases (EpiSurv). - Annual resident population estimates. Statistics New Zealand. Available from http://nzdotstat.stats.govt.nz/wbos/index.aspx
Numerator	Number of confirmed notifications of the indicator diseases (confirmed notifications meet specific case definition criteria, indicator also excludes people who were overseas during the incubation period)
Denominator	Estimated resident population, by Territorial Authority (TA)
Methodology	**Data collection** Campylobacteriosis, cryptosporidiosis and giardiasis are notifiable diseases in New Zealand. All cases diagnosed by doctors and/or laboratories are required to be notified to the medical officer of health in the region, who notifies the case to the national data collection (EpiSurv) administered by ESR, or directly to EpiSurv for further investigation. Cases that had been overseas at some point during the incubation period were excluded from the analysis, as they were unlikely to have contracted the disease within New Zealand **Confidence interval** 95% confidence intervals were calculated based on the methodology outlined in APHO (2008). Confidence intervals are presented as error bars on graphs. Age-standardised rates were calculated using the WHO Standard Population
Time period and time scale	Annual; from 2001 onwards
Population coverage	National
Spatial Coverage	National and by Territorial Authority (TA)

Measures of frequency	- Age-standardised rate of indicator disease notifications per 100,000 population - Age-standardised rate of indicator disease notifications per 100,000 population, by TA
Confidence interval methodology	Byar's approximations for calculating the 95% confidence interval for rates of events were used (Eayres 2008)
Limitations of indicator	- The relationship between the indicator diseases and climate is not fully determined. Associations have been made (particularly with increasing ambient temperature) but the mechanisms by which climatic factors change disease incidence are not fully established. - The indicator cannot currently show 'change' from the effects of climate. This is because we could not robustly compare a 'baseline period' with the 2001-onwards data. A common baseline period in climate change science is 1960-1990 (Mearns et al 2001). The 2001-onwards data that is used does not have a sufficiently comparable 1960-1990 period, because the national notifiable diseases database was not in operation then.
Limitations of data source	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. Most unnotified cases will be undiagnosed (i.e. the person who was ill neither saw a doctor nor visited a hospital, or the diagnostic test was not performed).
Related indicators	• Number of days below 0°C • Number of days over 25°C • Number of days with soil moisture deficit
For more information	ESR. Annual Surveillance Summary. Available from https://surv.esr.cri.nz/surveillance/annual_surveillance.php
References	Eayres D. 2008. *Technical Briefing 3: Commonly used public health statistics and their confidence intervals*. York: Association of Public Health Observatories. Mearns LO, Hulme M, Carter TR, et al. 2001. Climate Scenario Development. In: Houghton JT, Ding Y, Griggs M, et al. (eds). *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 739-768). Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.