

INDICATOR DATASHEET: NOTIFICATIONS OF CRYPTOSPORIDIOSIS, GIARDIASIS, SALMONELLOSIS

Type of Indicator	Health outcomes Climate change
Definition and units	Annual number of notifications of cases of cryptosporidiosis, giardiasis, and salmonellosis
Data source	Institute of Environmental Science and Research Ltd (ESR), which maintains the national database of notifiable diseases
Geographic Scope	New Zealand (NZ). Regional data are available at District Health Board level from our companion website, www.cphronline.massey.ac.nz .
Temporal Scope	Calendar year, from 1996 onwards.
Rationale	<p>Health is expected to change as a result of climate change; in many places, there is already evidence of health effects. One of the expectations is a changing incidence of some communicable diseases. Communicable diseases are those that are spread to humans by other people, vectors or by animals.</p> <p>There is a large number of communicable diseases that are linked to climate change. The Centre for Public Health Research (CPHR) has focused on those that are prevalent, and therefore likely to change, in NZ. We will continue to monitor ‘imported’ communicable diseases associated with climate change to ascertain whether they should be included as separate indicators.</p> <p>More information on the health effects of climate change is available on our website.</p>
Methodology	<p>Data was collected from publically available ESR reports, and ESR datasets that are used by CPHR for other purposes.</p> <p>The indicator used notification numbers rather than case rates because the indicator aims to provide a high-level summary of the national picture (i.e. comparison wasn’t required). Age-standardised rates (per 100,000 population for DHB regions) are available at www.cphronline.massey.ac.nz.</p>
Use of measure	<p>The indicator is best viewed in conjunction with a range of environmental health indicators, to see a more complete picture of environmental health in a changing climate.</p> <p>Notifications provide the national picture of disease incidence. We elected not to show regional level data for several reasons– it is available on the companion website, and small numbers of notifications in some regions resulted in what appeared to be (but was not) incomplete data.</p> <p>Monitoring will be useful on a regional scale, because climate changes and their health impacts are likely to show regional variation over time. Regional disease data are available at www.cphronline.massey.ac.nz. CPHROnline monitors age-standardised rates, meaning that comparisons between territorial authorities are possible.</p> <p>We plan to continue to measure this indicator over time, which will enable better conclusions about how these communicable diseases are changing with time.</p>

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<p>Limitations of the measure</p>	<p>The relationship between these diseases and climate is not fully determined. Associations have been made (particularly for salmonellosis and increasing ambient temperature) but the mechanisms by which climatic factors change disease incidence are not fully established.</p> <p>Notifications are an indirect measure of the burden of these diseases. Cases of all three diseases go unreported because medical attention is not sought. This is likely to be particularly true in rural regions, where the incidence is higher (due to untreated drinking water and increased animal exposure) and health services are less available.</p> <p>The indicator cannot currently show 'change'. This is because we could not robustly compare a 'baseline period' with the 1996-onwards data. A common baseline period in climate change science is 1960-1990¹; during this time, the effects of human-produced climate change are not thought to be apparent. The 1996-onwards data that we used did not have a sufficiently comparable 1960-1990 period, because the national notifiable diseases database was not in operation then.</p>
<p>Limitations of data sources</p>	<p>The data includes notified cases of disease only, and will be an underestimate of the total burden of these diseases. Most un-notified cases will be undiagnosed (i.e. the person who was ill did not see a doctor or the diagnostic test was not performed).</p> <p>The national notifiable disease database EpiSurv began in 1996. Notification rates for the first few years are lower than subsequent years. This is due to the time taken for notification to</p>
<p>Related Indicators</p>	<p>Number of days over 25°C Number of days in soil moisture deficit Vulnerable populations (particularly age <5 years)</p>
<p>Recommendations for future development of indicator</p>	<p>NZ and international studies have identified the relationship between monthly mean temperature and salmonellosis– this could be continued on an on-going basis as an indicator.</p> <p>Similar relationships between cryptosporidiosis and giardiasis and rainfall/drought are postulated, but studies have conflicting results about the direction of effect.</p>
<p>References</p>	<p>1. IPCC. Climate Scenario Development. In: Climate Change 2001: Working Group I: The Scientific Basis. GRID-Arendal, 2001. (Accessed June 4, 2014, at www.grida.no/publications/other/ipcc_tar.)</p>