HEALTH EFFECTS OF CLIMATE CHANGE

This factsheet explains how climate changes affect health, and shows relevant New Zealand data.

RELATED FACTSHEETS

Temperature, Climate Change and Health
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New Zealand's climate is changing

There is now clear evidence that the world's climate is changing.

Between 1880 and 2012, the world warmed by an average of 0.85°C. In addition to warmer average temperatures, there is evidence of sea level rise, melting of Northern Hemisphere snow and ice, and a change in ocean temperatures.[1]

Over the period 1910-2010, the mean annual temperature in New Zealand (NZ) rose by 0.96°C.[2] Climate scientists predict that NZ will continue to warm by 2°C by the year 2090, and that there will be changes in rainfall, drought, fire risk and wind patterns in different parts of NZ.[3,4]

Climate changes have effects on our health

Health leaders have called climate change 'the biggest global health threat of the 21st century'.[5]

Climate changes can affect health in different ways[6]:

- Direct health effects include injuries or deaths caused by weather itself- like drowning from a flood, or 'heat stroke'.
- Indirect health effects happen when a changing climate changes biological processes- like making mosquito-borne diseases capable of breeding in new regions (see side bar).
- Diffuse health consequences result when people need to substantially change their lives as a result of climate changes- like moving off a farm because of on-going drought.

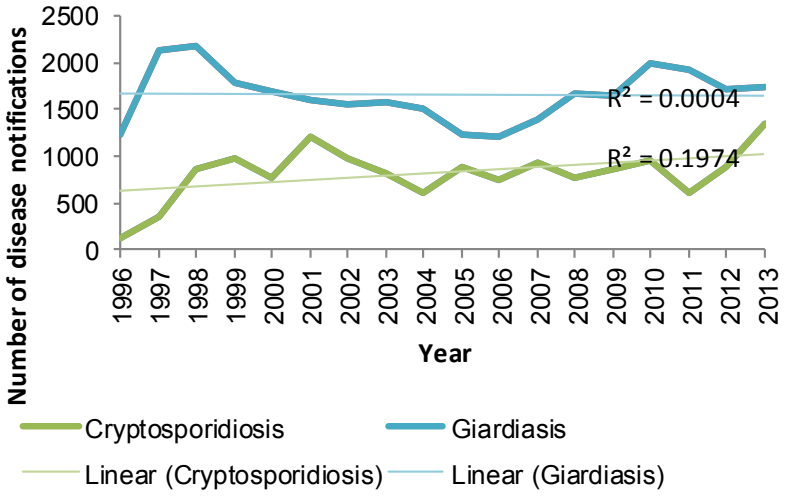

Figure 1
National notifications of cryptosporidiosis and giardiasis, 1996-2013
Data Source: Institute of Environmental Science and Research Ltd (ESR)

Indirect health effects of climate change

Globally, there is concern that numbers of many diseases may increase as a result of climate change. These include dengue fever, malaria, West Nile virus, chikungunya fever, salmonellosis, cryptosporidiosis, Lyme disease, and cholera. Often, this is the result of an increasing number of 'host' species that carry these diseases (like rats and mosquitoes). Sometimes an extreme weather event can increase disease- like a floodzone increasing the water-borne disease cholera.

NZ's comparative isolation, temperate climate, and low population density make it relatively protected from many of these diseases. However, NZ's incidence of climate-sensitive diseases may start to increase. This could occur if disease incidence increases in neighbouring countries, or if our climate changes enough that host species (like mosquitoes that carry dengue fever) are able to survive in NZ. Dengue fever and chikungunya fever are examples of climate-sensitive diseases that are a threat in the Pacific (including Australia), but that cannot be acquired in NZ.[7]

HEALTH EFFECTS OF CLIMATE CHANGE continued

Longer term data needed before health effects of climate change can be conclusively shown

Health effects of climate change have not been conclusively observed in NZ to date.

Climate change trends occur over many years, so we must use correspondingly long term health data to conclusively show changes in disease incidence due to climate change. However, the way that health information is collected has changed with time, which means it is difficult to compare data prior to about 1990.

We reviewed 1996-2013 notifications of cryptosporidiosis and giardiasis (Figure 1), which are believed to be related to rainfall patterns.[8] Although the results appear to show an increasing number of cryptosporidiosis cases over time (R^2 for trend=0.19), this is largely due to an increase in notifications in the first few years of the national surveillance notification system and EpiSurv database (for the years 2000-2013 only, R^2=0.01). Longer-term data are required before conclusive trends are shown. Giardiasis case numbers did not show an increasing or decreasing trend (1996-2013 R^2=0.0004, 2000-2013 R^2=0.18).

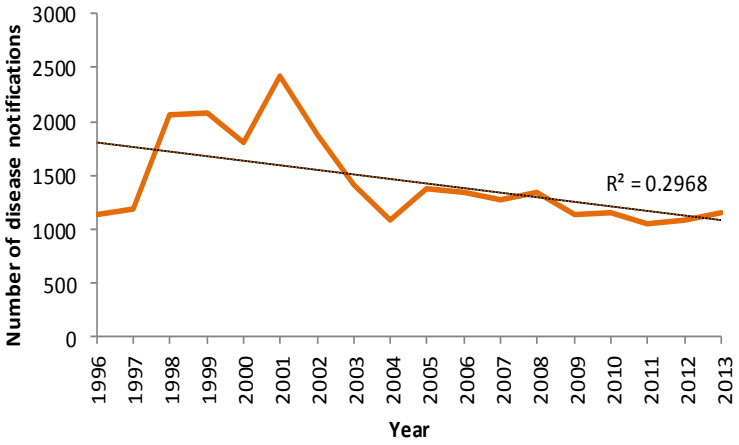

Figure 2
National notifications of salmonellosis, 1996-2013
Data Source: Institute of Environmental Science and Research Ltd (ESR)

Salmonellosis is another climate-sensitive disease. A 1°C increase in monthly average temperature was associated with a 15% increase in salmonellosis notifications in one study.[9] In NZ, the data show a decrease in salmonellosis since 1996 (Figure 2) which is thought to be primarily due to improved food safety.

'Direct' and 'diffuse' health effects of climate changes may be monitored by CPHR in the future depending on dataset availability and robustness.

References

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For more information, please contact Fei Xu on f.xu@massey.ac.nz