Climate change and human wellbeing: implications for health promoters

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Abstract

This article provides an introduction to climate change, describes the likely consequences of climate change for wellbeing and social equity in New Zealand and the Pacific, and discusses what part health promoters can play in responding to the threat of climate change, helping communities build resilience to change, and preparing them for the adaptations that will be needed.

What is climate change?

We all know that the weather changes day by day and these changes are difficult to predict. But the weather varies within the limits of a much more predictable climate that has been stable for the past twelve thousand years. Over the last century, though, human activities have altered the makeup of the atmosphere. Almost all climate scientists agree that the world has begun to warm as a result of increasing greenhouse gas emissions (mainly carbon dioxide and methane) from industry and changes in land use such as deforestation. Although the overall trend is for warming, we will still have varied weather, and we are more likely to experience extremes in weather. These are the conclusions of the Intergovernmental Panel on Climate Change – the expert body set up by the United Nations, and these conclusions are not changed or threatened by recent media debates.

The evidence is strong enough for us to be concerned about the impacts of climate change on the world, the Pacific and on New Zealand. (Intergovernmental Panel on Climate Change, 2007) In particular, we need to be concerned about the impacts on human wellbeing and social equity. Although we can now say with high levels of certainty that climate change is happening as a result of human activities, the impacts on wellbeing are more difficult to predict because there are different paths society can take in response to climate change, and because social and natural systems will respond unpredictably as thresholds are reached. All the same, it is becoming clear that...
climate change poses many important health risks – in fact, climate change has been described by the Lancet as ‘the biggest global health threat of the 21st century’. (Costello et al, 2009)

We describe below the main risks of climate change for wellbeing in Aotearoa and the Pacific, the actions needed to address climate change, and opportunities to simultaneously promote health and address climate change. We end with some suggested ways that health promoters can contribute to tackling climate change.

**Risks of climate change to health**

**Extreme weather events**

Extreme weather events include storms, flooding, droughts and heat waves. All are predicted to become more frequent and severe as a result of climate change. (Intergovernmental Panel on Climate Change, 2007)

Storms and flooding affect health through interruptions to basic services such as water and electricity supplies, and indirectly through damage to property or crops. When severe, they threaten people’s safety, with children likely to be particularly vulnerable. (Bunyavanich et al., 2003; Hosking et al., 2010) Flooding and erosion will be an increasing threat to settlements on the west coast of New Zealand, particularly in Northland and the East Cape, with Māori land, coastal settlements and economies particularly vulnerable. (Packman et al., 2001) Flooding and rising sea levels also threaten the supply of fresh water to coastal settlements. (Costello et al., 2009)

Droughts also have health implications. Safe and sufficient water supplies are a basic requirement for drinking, cooking and hygiene, and droughts also threaten crops and the farming incomes. As average temperatures rise, extreme heat events become more common, and deaths due to cold weather less common. In 2003, heat waves in Europe killed an estimated 70,000 people. Although such events are not predicted for New Zealand, some groups, such as outdoor workers, are likely to become vulnerable to heat stress from rising temperatures. (Philippa Howden-Chapman et al., 2010)

**Infectious diseases**

As average temperatures warm, there are likely to be changes to food- and mosquito-borne illnesses. A warmer climate is likely to create more favourable conditions for food-borne illness, as diseases which are already a problem, such as those caused by campylobacter and salmonella, occur more commonly in warmer weather. (Philippa Howden-Chapman et al., 2010)

Aotearoa is not yet warm enough to be a suitable home for the mosquitoes that carry dengue fever; but climate change increases the likelihood of these mosquitoes becoming established in the north of the North Island. This would greatly increase the risk of dengue fever and other mosquito-borne illnesses, particularly in Auckland.

**Food supplies**

Climate change threatens the security of food supplies in the context of ongoing rapid population growth and increasing food consumption per person. (Costello et al., 2009) Unpredictable fresh water supplies and energy costs involved with both growing and transporting food will decrease both availability and affordability. Preventing deforestation to maximise the carbon dioxide removed from the atmosphere by forests reduces the land available for food production, which could increase food scarcity and food prices. Storms, floods and droughts also interfere with food production. Climate-related factors contributed to a dramatic spike in food prices in 2008. Food price spikes globally result in more families being pushed into food insecurity. (Costello et al., 2009) The ocean acidifies as it absorbs more carbon dioxide, further stressing marine environments and threatening fish stocks that many Pacific communities rely on for food and livelihoods. (McMichael, 2008)

**Social disruption**

Vulnerability to climate change depends on the likelihood of climate related impacts in a given country (e.g. sea level rise, or increasing scarcity of water), and the resources available to adapt, with poorer countries more at risk than rich countries. Pacific Island nations are recognised as being especially vulnerable because of poverty, the impact of sea level rises and tropical storms on low lying islands, and a heavy reliance on fragile fish stocks. (Mimura et al., 2007)

These factors are already leading to forced migration from some islands. This has major social and health implications for those displaced, including the need to find new livelihoods and housing, and the mental health effects of losing homeland. The forced migration of whole island populations, such as that of the Tuulun people of the Carteret Islands near Papua New Guinea is already underway, with timely relocation planning needed to prevent the worst impacts of displacement. (Rakova, 2008) The three most vulnerable Pacific Islands (Kiribati, Tuvalu and Tokelau) have a combined population of more than 250,000 people. Families forced to migrate are likely to move into overcrowded houses with family members already living in wealthy nations, with New Zealand being a main destination. An influx of climate refugees puts particular pressure on the health systems of destination countries.

**Equity**

The worst effects of climate change are predicted to be felt in low- and middle-income countries. These countries are responsible for only a small part of the emissions that have caused climate change to date, and have also seen little of the associated wealth created. This makes climate change a major global justice issue. (Hosking et al., 2010) Countries like New Zealand (which has among the highest per-capita emissions in the world) therefore have responsibilities to reduce the threat of climate change. (Metcalfe et al., 2009) Globally, indigenous peoples have also made little contribution to emissions, but may lack the financial resources needed to adapt, and be more heavily dependent on threatened fisheries and coastal ecosystems. Climate change will therefore become an increasingly important barrier to achieving core health promotion related to social justice, and Tiriti-based practice.

**What action is required to address climate change?**

Three kinds of actions are needed to address climate change. First, we need to act now to reduce greenhouse gas emissions and prevent runaway climate change. Second, we need to find ways of adapting society to the changes that are now unavoidable. Third, we need to build resilience to change within communities, and ensure that both the benefits and costs of these changes are felt fairly across society. Preventing runaway climate change involves reducing overall greenhouse gas (GHG) emissions. This means both reducing the amount of GHGs emitted, and increasing the amount of carbon
dioxide taken up by forests. Global co-operation is needed to reduce global emissions to an acceptable level, i.e. reductions of 40% below 1990 levels by 2020, and by 80-95% by 2050 (Metz et al., 2007). New Zealand needs to commit to strong, responsible emissions reduction measures if it hopes to be effective in persuading other countries to follow suit. Because our GHG emissions have been increasing, this means halving our GHG emissions by 2020 (Metcalf et al., 2009).

Not all of the effects of climate change can now be avoided. New Zealand needs to strive to prevent climate change to the greatest extent possible, but also prepare to adapt to those climate change effects that are now unavoidable, and assist Pacific nations to adapt.

In choosing strategies to reduce emissions, and to adapt to climate change effects, we should prioritise actions that also improve other aspects of social wellbeing and equity. In other words, we need to build community resilience to multiple challenges, not just climate change. Fortunately, several of these ‘win-win’ actions have already been identified, and these are discussed below. Many of these actions are the same as those discussed in the previous paper about broader issues of sustainability and health. While we focus on climate change it is vital we identify actions that contribute to broader sustainability goals. This means that technical fixes are less likely to be useful than shifts in underlying behaviours and social norms.

**Health ‘win-wins’ of climate change action**

**Housing and heating**

Housing improvements offer several opportunities to simultaneously reduce GHG emissions and improve health. Improved home insulation increases the energy efficiency of heating, so less energy is required to heat a home to a healthy temperature. This can lead to warmer homes and lower heating costs for occupants, both of which are positive for wellbeing. (P. Howden-Chapman et al., 2007)

Changing the way homes are heated can also lower GHG emissions and improve health. Changing from unflued gas heaters (which emit GHGs and are also associated with asthma and respiratory illness) to more efficient options like heat pumps or high efficiency wood burners can reduce GHG emissions as well as improve respiratory health, since unflued gas heaters are linked with increased asthma and respiratory illness. (P. Howden-Chapman et al., 2008)

Ensuring that insulation and heating improvements reach low-income families requires government support. Initiatives are underway to improve insulation and heating in Housing New Zealand houses, however greater attention is required to ensure equity in insulation provision in privately owned rental housing and for low income households to ensure those families most at risk from housing-related illness.

Health promotion practitioners, a good number of whom are involved in healthy housing programmes, are well-placed to contribute to the further development of these programmes to maximise gains for health, climate and equity.

**Transport**

Motorised transport is a major and fast-growing contributor to GHG emissions in New Zealand. (Ministry for the Environment, 2009) Substantial reductions in emissions would result from a shift from car use to low-emissions public transport, or to walking and cycling, which are “zero-emission” travel modes. These changes in travel would have several health co-benefits, such as increasing physical activity, reducing air pollution and potentially improving road safety. (Woodcock et al., 2009)

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To ensure these shifts in travel behaviour occur equitably, public transport will need to be more affordable and accessible to all communities. Good urban planning will be needed to ensure the accessibility of appropriate goods, services and employment. This kind of linked, equity-focused urban and transport planning will also help reduce car dependence and reduce the vulnerability of low-income families to fuel price rises. Promoting physical activity is already an important area of practice for the health promoters. Promoting active transport, along with the infrastructure needed to support it, is an opportunity for health promoters to achieve benefits for both climate and health.

### Food and Nutrition

Agriculture is a major contributor to GHG emissions, both from the methane emissions of cows (and other animals), and changes in land use. At the same time, health promoters are working to increase fruit and vegetable intake, and reduce people’s intake of saturated fat. A shift to consumption of less meat and dairy products, and more fruit and vegetables, would have both nutritional and climate benefits. (Friel et al., 2009)

With increasing food prices a likely result of climate change low-income families are at risk of being pushed into food insecurity. To avoid increases in nutrition inequities, we will need to develop strategies that make low-cost fruit and vegetables widely available. Innovative health promotion approaches such as community gardening, along with promoting gardening at schools and at home, may be one solution. Gardening can increase access to healthy food at low cost, promote physical activity and improve social networks, as well as reduce fuel use from transporting food. Such programmes can also help to spread the costs of climate change more fairly if they are targeted at low income communities.

### Conclusion: what can health promoters do?

As well as identifying ways that health promotion programmes can be reoriented to respond and adapt to climate change and contribute to broader environmental sustainability goals, there are a number of other suggested actions for all health professionals. The suggestions summarised below bring the ‘win-wins’ described above with other actions health promoters can take, and are adapted from the work of Griffiths and colleagues. (Griffiths et al., 2008)

1. Inform ourselves and each other about the health and social effects of climate change
2. Reorient health promotion programmes to contribute to climate change objectives
   a. “green” Green Prescriptions
   b. Healthy and sustainable Kai
   c. Equity focused housing insulation programmes
3. Promote energy efficiency at work
4. Drive and fly less, walk and cycle more
5. Influence food menus for local food with less meat
6. Be a champion – join with others to advocate for central and local government to respond responsibly to climate change

### References


SECOND ARTICLE

Environmental sustainability and health promotion

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Together Alex and Rhys are developing Māori environmental health teaching and research at the School of Population Health.

Abstract
This paper reviews the links between health promotion and environmental sustainability, emphasising the importance of these links to today’s health promotion practice. We propose a definition of sustainability in health building on Māori models of wellbeing, review the current state of the earth’s ability to sustain human wellbeing, discuss issues of equity and give examples of how health promotion practitioners can incorporate understandings of environmental sustainability and health into practice.

Introduction
The reliance of human wellbeing on the integrity of environmental systems has been well known for centuries, and continues to be recognised in the health models of indigenous peoples throughout the world. Urbanisation, advances in disease treatment and the structure of economies have all moved Western models of human health away from connections with environmental wellbeing. It has become vital to bring this link back into practice.

Urbanisation in particular has allowed us to divorce our understanding of wellbeing from our use of natural resources. Most of the world’s population now live in cities, relying on goods and services produced at a distance from where we live. This allows us to consume without seeing directly how things are produced or how that production impacts on the natural environment. Rapid population growth and rapid growth in consumption per person has meant that globally humans have moved beyond the Earth’s ability to provide adequate resources and still regenerate or renew those resources (this is known as the Earth’s carrying capacity).

In Aotearoa, we have a number of powerful indigenous models and concepts that can be used as a foundation for our understanding of wellbeing and sustainability. For example, Mason Durie’s model of health promotion, Te Pae Mahutonga (Durie, 1999), includes waiora, which he describes as “a spiritual element that connects human wellness with cosmic, terrestrial and water environments”. He calls upon health promoters to consider the “nature and quality of the interaction between people and the surrounding environment”, balancing economic development with environmental protection. Closely related is the traditional Māori concept of ka tikatanga, a guardianship responsibility over biodiversity and natural resources to ensure a plentiful supply for future generations (whakatipuranga). This obligation overlaps with Eurocentric notions of conservation, but is conferred by whakapapa, with a particular inherited and legal stewardship meaning for Māori in their ancestral land, tribal rohe or tūrangawaewae. The history of iwi management of local natural resources also suggests a model for achieving effective governance of shared resources to prevent resource degradation and collapse (Dietz T et al., 2003).

What is sustainability?
The concept of sustainability implies that for the existing life-support system to remain fully functional in order to nurture future generations, it must be able to regenerate itself fully in response to “drawing down” on resources, as well as in response to any crisis or disaster. Given this underlying requirement, AtKisson (Atkisson A, 1999) provides three commonsense but necessary conditions for survival:

1. Not using up natural resources (such as fish stocks, freshwater) faster than they can replenish themselves

2. Investing ahead to develop replacements for depleted non-renewable resources (fossil fuels, fertile soils) while we still have the wealth from using those resources

3. Not producing wastes faster than natural processes can absorb them

These conditions could be met unethically by allowing populations in developing countries and poor populations within wealthy countries to collapse as a direct result of resource exploitation by wealthy nations. However, these conditions need to be met in alignment with internationally agreed social equity goals (United Nations General Assembly, 2000). Social equity and environmental sustainability are therefore intertwined, and one cannot be meaningfully achieved...Continued on page VI
without the other. The next section shows that it doesn’t matter which indicators we use to help us measure ecological sustainability; we are not yet achieving the conditions just described.

**State of the world’s ecosystems**

There is a great deal of public debate currently about climate change as a threat to global environmental stability, however climate change is only one symptom of wider ecological crisis. Although focusing on climate change is appropriate and timely, we risk ignoring other important signs that require us to respond with broader, more fundamental changes.

At a global level, the United Nations commissioned an assessment of ecosystems in 2000 — the Millennium Ecosystem Assessment (Millennium Ecosystem Assessment, 2005), which took a very human-centred approach to ecosystems, looking at services that the Earth provides for us, and undertaking a “health check” of 24 of these services. Services were grouped into provisioning services (e.g. food, fresh water, genetic resources), regulating services (e.g. air and water quality, climate regulation), and cultural services (e.g. spiritual values, recreation and tourism). Of the 24 indicators only four were in positive balance. These related mainly to crop and livestock production, with enhancements being very unevenly distributed across the world. Damage to ecosystems has a more direct influence on the wellbeing of poor communities than wealthy ones, and improvements in social equity can buffer communities from ecological change, although even the wealthiest communities cannot be insulated from the long term effects of environmental degradation.

In 2009 Rockstrom and colleagues (Rockstrom J et al., 2009) proposed nine thresholds or planetary boundaries that we need to stay within to maintain a stable environment for human wellbeing and development. The current state of these boundaries is shown in Figure 1 below. The boundaries in three of the nine systems (rate of biodiversity loss, climate change and human interference with the nitrogen cycle), have already been exceeded, while two have not yet been quantified.

In 2008 Statistics New Zealand published a report monitoring our progress towards “sustainable development” — Measuring New Zealand’s Progress Using a Sustainable Development Approach:2008 (Statistics New Zealand, 2009). This snapshot of progress towards sustainable development used key indicators about how well we live, how well resources are distributed, how efficiently we use resources and what we are leaving behind for our children. Although trends about how well we live and how efficiently we use resources were heading in the right direction, trends were heading in the wrong direction when it came to social equity and what natural and cultural resources we are leaving our children. Of concern were New Zealand’s high per capita greenhouse gas emissions compared with other countries, increasingly degraded rivers and groundwater, the increasing degradation of soils, and an ongoing loss of biodiversity through species extinctions.

Although New Zealand is a small country, we are a developed nation and we consume a lot of energy and manufactured goods per person. The impacts of our lifestyles and economy reach beyond our shores to affect global environmental sustainability. Our neighbours and whanaunga in Pacific Island nations are directly experiencing threats to livelihood and habitat, for example because of the increasing fragility of fish stocks and the contamination of drinking water by seawater as sea levels rise because of climate change.

**How can we meet the necessary conditions for sustainability?**

Meeting the three conditions for sustainability described above will require a mixture of the following: limiting overall population growth, limiting the amount of resources we use per person, particularly in the developed world, and changing the type of resources we use to be more renewable (Meadows D et al., 2004).

Some principles about what is required for New Zealand to achieve a strong version of long-term sustainability come from Sustainable Aotearoa New Zealand (SANZ) (Sustainable Aotearoa New Zealand, 2009), a network of practitioners, academics, organisations and community members. As well as changing the way we think about quality of life and the economy, the following are six essential actions for New Zealand summarised from their work:

![Figure 1. Planetary boundaries. The inner green shading represents the proposed safe operating space for nine planetary systems. The red wedges represent an estimate of the current position for each variable.](Reprinted by permission from Macmillan Publishers Ltd: NATURE 461, copyright 2009)(Rockstrom J et al., 2009)
1. Limit our discharges or emissions to air, water and land to be within the capacity of the air, water and land to deal with them
2. Regenerate and grow our natural and social capital
3. Change to using renewable resources wherever possible, and use them efficiently. Recycle non-renewable resources
4. Educate ourselves and each other about our relationship with the Earth and its environmental systems
5. Embed this understanding in our social structures, including central and local government, legal, educational and economic structures
6. Only export goods that are made using sustainable processes and practices, and only import goods that have been produced sustainably.

In health practice, it will be vital to centre our understanding of wellbeing on our two way relationships with global as well as local environmental systems, building on the foundation that exists in indigenous models of wellbeing. Now that we are pushing up against the Earth’s ecological boundaries it is no longer sufficient to consider guardianship of discrete local ecosystems or rohe. We also need to consider how concepts such as kaitiakitanga and waiora can be extended to include the stewardship of global as well as local natural resources.

Understanding sustainability from a health promotion standpoint also means including new ways of thinking about equity issues. Health promotion deals daily with issues of socioeconomic and ethnic inequity, but we also need to consider equity across generations and between species (for example recognising the rights of nature to exist and thrive as has been done in the 2008 constitution of Ecuador).

**What does this mean for health promotion practice?**

*Knowing is not enough; we must apply. Willing is not enough; we must do.* Goethe

Although reports about the current state of the world’s ecological services are quite gloomy, if we can change our economy and society towards a strong version of sustainability, this can have important positive effects on health. But we need to get the interventions right to avoid creating tensions between environment, health and equity. For instance, encouraging more sustainable means of transport than car use has benefits that include reducing greenhouse gas emissions, reducing air pollution and increasing physical activity. However, if this is achieved by increasing the price of petrol without providing affordable alternatives, social inequities are likely to result as the costs are disproportionately felt by poorer households, and access to healthcare and employment become more difficult for those households. To achieve the potential benefits for wellbeing and social equity health practitioners need to have a voice in decision-making, as well as empowering communities to have a voice, for example by developing partnerships with local government and advocating for greater participation in democratic decision-making.

Community empowerment and community participation skills are already part of the health promotion toolkit. These skills are vital to increasing the capacity of communities and governments to make decisions that maximise the benefits for health, equity and the environment. Health promoters are in the business of changing social norms around health-related behaviours, and this experience lends itself well to changing social norms towards more sustainable lifestyles.
In some instances health promotion and environmental sustainability goals are already aligned. One example of this is in housing insulation programmes for low-income families. These programmes can improve wellbeing and social equity through warmer, drier houses and more affordable home heating, and they also lead to decreased electricity use by households, contributing to environmental sustainability objectives. These programmes could be extended to further meet social equity and sustainability objectives, for instance by building capacity for small scale renewable energy projects to serve the electricity needs of low income communities.

Some existing health promotion programmes could be changed slightly to align health and sustainability goals. For example Green Prescriptions could be made truly “green” by encouraging physical activity within people’s daily lives, such as walking or cycling to work. Nutrition programmes could be adapted to encourage people to buy food that is produced locally or to grow their own fruit and vegetables, increasing urban food production and reducing the energy needed to transport food over long distances.

As well as recognising and aligning health and environmental sustainability goals in our programmes, health promoters can play a part in re-orienting the organisations we work in to be more environmentally sustainable. Encouraging recycling, reducing electricity use at work, adopting active commuting habits and asking questions about where our workplaces buy goods and services from are all ways we can start changing the way our organisations do business towards greater sustainability.

It is clear that human induced environmental changes are creating unforeseen threats to human survival and wellbeing, as well as the survival of many other species. Health promoters already work on upstream social determinants of health, and are therefore well positioned to enable, advocate and mediate for wellbeing based on environmental sustainability.

References