NZMA
New Zealand Medical Association

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Climate Change Consultation Contribution
Ministry for the Environment
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New Zealand's Climate Change Target

"The evidence is overwhelming: climate change endangers human health. Solutions exist and we need to act decisively to change this trajectory." – Dr Margaret Chan, WHO Director-General.[1]

Dear Sir/Madam

The New Zealand Medical Association (NZMA) welcomes the opportunity to provide feedback to the Ministry for the Environment on its consultation on New Zealand's climate change target.[2] Our association has a strong interest in the links between climate change and health, and our feedback to the Ministry is focused on the importance of taking into account these links when setting New Zealand's target reductions in greenhouse gas (GHG) emissions.

The NZMA is the country's largest voluntary pan-professional medical organisation with approximately 5,000 members. Our members come from all disciplines within the medical profession and include general practitioners, doctors-in-training, specialists, and medical students. The NZMA aims to provide leadership of the medical profession, and promote professional unity and values, and the health of New Zealanders.

Our submission is informed primarily by our existing position statement on Health and Climate Change (attached),[3] although this statement is currently in the process of being updated. We also draw on the New Zealand College of Public Health Medicine (NZCPHM) policy statement (and supplements) on Climate Change[4,5,6] which the NZMA has formally endorsed. The NZMA also shared the concerns of other health professional organisations that, in September 2014, issued a joint call for action on climate change and health.[7]

The NZMA considers climate change to be a serious threat to health and health equity.[8] Six years ago, a report published in *The Lancet* stated that "climate change is the biggest global health threat of the 21st century",[9] sentiments that were echoed by same journal's editors in 2014.[10]

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We believe that the consultation document[2] fails to give sufficient consideration to the health impacts of climate change, including the impacts on health equity. We note that the Ministry of Health is not listed as a government agency that is involved in this work. We also note that the costs to health from inaction on climate change, as well as the benefits to health from climate change mitigation measures, are not included in economic analyses.[11] We are concerned that the omission of health considerations in this work may reflect a fundamental under-appreciation of the health impacts of climate change.

The effects of climate change on health and health equity in New Zealand will be large and wide ranging; these effects have been described in detail in the New Zealand Medical Journal of 28 November 2014 (attached).[12] The threats to health from climate change in New Zealand include the following: i) direct impacts (eg, morbidity and mortality from high temperatures and other extreme weather events; (ii) biologically-mediated events (eg, changing patterns of infectious disease); and (iii) socially-mediated impacts (eg, loss of livelihoods, forced migration, economic vulnerability and increased risks of conflict).[13,14] Vulnerable population groups such as Māori, Pacific peoples, children, elderly and low income people are likely to be the worst affected by the adverse health impacts of climate change.[13,15] Conversely, well-designed emission reduction measures (eg, a shift to active and public transport, a diet with less red meat and animal fat, and improved housing energy efficiency) can bring about substantial health and health equity co-benefits, including reductions in type 2 diabetes, heart disease, road traffic injuries, cancer, respiratory disease, and improvements in mental health.[16–20]

We contend that any discussions about measures to address climate change, including setting national targets for the reduction in GHG emissions, must include health and wellbeing considerations at its core. A Health Impact Assessment is essential and we suggest that the Ministry adopt a 'Health in All Policies Approach' to its work. This is an approach to public policies across sectors that systematically takes into account the health implications of decisions, seeks synergies, and avoids harmful health impacts, in order to improve population health and health equity.

The NZMA believes that a healthy environment is a key determinant of health. As such, we consider that action to mitigate climate change should be viewed as an investment rather than a cost. We request the Ministry to reflect this approach in its decision making. We submit that the economic analysis of the costs of the various GHG reduction targets that are set out in the consultation document needs to take into account the costs to health from inaction on climate change as well as the benefits to health from climate change mitigation measures.

Our existing position statement on Health and Climate Change notes the significance of anthropogenic contributions in causing climate change, and calls for reducing GHG emissions to be seen as a public health priority.[3] These calls have also been made by the World Medical Association (WMA)[21] representing 10 million physicians worldwide, and the Australian Medical Association, which has called on the Federal Government to show leadership in reducing GHG emissions ahead of the United Nations Climate Change Conference in Paris later this year.[22] Most recently, the WMA urged its 111 national medical associations (including the NZMA) to write to their national negotiating representatives to emphasise that climate change is the greatest global health challenge of the 21st century, and to give health issues a greater priority in the upcoming United Nations climate change talks.[23]

New Zealand contributes 0.2% of world GHG emissions with 0.06% of the global population, which means we have the fifth highest per-capita annual gross GHG emissions amongst established economies.[4] New Zealand's current target is a reduction in GHG emissions of 5% below 1990 levels by 2020, with a long term target of a 50% reduction by 2050. We note that the

Ministry itself acknowledges the expectation to table a target that is more ambitious than the current target.[2]

The NZMA currently does not have a specific target for New Zealand's GHG reductions but we are considering this as part of the review of our existing position statement. Nevertheless, we note that New Zealand's existing targets are well below what technical experts calculate is necessary from established economies in order to stay within the 2° warming limit the government committed to in 2010, under the United Nations Framework Convention on Climate Change. The Intergovernmental Panel on Climate Change suggested emissions reductions by established economies of 25–40% below 1990 levels by 2020, and 80–95% below 1990 levels by 2050.[24] We draw the Ministry's attention to the Greenhouse Development Rights (GDR) framework's Responsibility and Capability Index, alluded to in the NZCPHM position statement on climate change. The GDR index combines countries' cumulative emissions with their capability to mitigate, and would expect New Zealand to reduce its emissions by 41% below 1990 levels by 2020.[5] New Zealand's existing targets are also considerably less ambitious than other emitters. We note in the consultation document that the European Union has a target of reducing GHG by 40% below 1990 levels by 2030, and that the United States has a target of reducing GHG by 26–28% below 2005 levels by 2025.[2]

New Zealand also has a special responsibility for the small Pacific Island countries. These countries have extensive people to people links with New Zealand and are also particularly vulnerable to the effects of climate change. The Consensus Statement on the role of the doctor in New Zealand stipulates that as health advocates, doctors have a commitment to the health of all New Zealanders, but this exists alongside a professional responsibility for the health of individuals and communities throughout the world.[25] As such, when deciding on a GHG reductions target, we contend that the Ministry needs to also take into account the impact of climate change on global health and equity, with a particular focus on the implications for the small Pacific Island countries. Finally, we draw the Ministry's attention to the editorial in the latest issue of the New Zealand Medical Journal (attached) that calls for health and wellbeing to be at the centre of climate policy negotiations, and articulates the responsibility that health professionals have to their patients and communities to push for strong, health-centred climate action.[26]

In conclusion, we submit that health considerations be given considerably more attention by the Ministry during its deliberations on GHG reductions targets. Health Impact Assessments should be an essential part of the work undertaken when deciding on our intended nationally determined contribution. Rather than restrict its view to the costs of action, we believe that mitigating climate change should be seen as an investment in protecting the health and well being of New Zealanders, as well as the sustainability of some of the key determinants of health, including the environment.

We hope that our feedback has been helpful and would welcome the opportunity to engage further with the Ministry as it considers this important issue in the lead up to the Paris meeting in December.

Yours sincerely

Dr Stephen Child
NZMA Chair

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Attachments

NZMA. Position statement on health and climate change. Under review.

Bennett H, Jones R, Keating G, et al. Health and equity impacts of climate change in Aotearoa-New Zealand, and health gains from climate action. N Z Med J. 2014 Nov 28;127(1406):16–31.

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Health and Climate Change

Approved May 2010

The NZMA recognises the important role the health sector plays in supporting the efforts of all New Zealanders to find environmentally responsible ways to perform their daily activities by contributing to the management of global environmental issues, such as issues relating to climate change.

In relation to climate change the NZMA:

1. Concurs with the scientific consensus that the Earth is undergoing adverse global climate change and that anthropogenic contributions are significant.

2. Believes these climate changes will create conditions that affect public health, with disproportionate impacts on vulnerable populations, including children, the elderly, and the poor.

3. Supports educating the medical community on the potential adverse public health effects of global climate change and incorporating the health implications of climate change into the spectrum of medical education, including topics such as population displacement, heat waves and drought, flooding, infectious and vector-borne diseases, and potable water supplies.

4. Recognises the importance of medical input in policymaking at the national and global level and supports efforts to search for novel, comprehensive approaches to mitigating the effects of climate change to protect the health of the public.

5. Recognises that whatever the relative contributions of different causes of climate change, policymakers should work to reduce human contributions to such changes.

6. Encourages doctors and other health professionals to assist in educating patients and the public on environmentally sustainable practices, and to serve as role models for promoting environmental sustainability.

7. Encourages doctors to work with government agencies to strengthen the public health infrastructure to ensure that the global health effects of climate change can be anticipated and responded to more efficiently.

8. Supports epidemiological, translational, clinical and basic science research necessary for evidence-based global climate change policy decisions related to health care and treatment.
9. Believes that the Government needs to prioritise mitigation efforts according to effectiveness and cost effectiveness.

10. In relation to climate change and human health, the NZMA believes that:

- because climate change involves potentially serious or irreversible harm to the environment and to human health, it is essential to adopt mitigation strategies that reflect a

precautionary approach even where uncertainties may exist in relation to scientific evidence,

- failure to achieve significant reductions in greenhouse gas emissions on a global basis is likely to cause significant public health problems,
- effective measures for improved energy efficiency, clean energy production and other emission reduction measures are likely to contribute to reducing the health impacts of climate change,
- economic assessments of the costs and benefits of mitigating climate change must incorporate the predicted public health costs of unmitigated climate change,
- there should be greater awareness, at all levels of government, of the direct and indirect impacts of policies, regulations and programmes on energy use and greenhouse gas emissions,
- individuals, businesses and organisations should be informed about, and take measures to reduce, their carbon footprint by making appropriate changes to consumption patterns,
- like the AMA, supports the development and implementation of a National Strategy for Health and Climate Change to ensure that New Zealand can respond effectively to the health impacts of gradual climate change, extreme events, and to people's medium - to long-term recovery needs. That strategy should incorporate the following:
    - localised disaster management plans for specific geographical regions that model potential adverse health outcomes in those areas and incorporate appropriate localised health and medical response measures, including for people who have been evacuated or relocated, temporarily or permanently,
    - measures targeted to the needs of certain vulnerable population groups (elderly, children, Maori and Pacific Island peoples, members of rural communities),
    - development of effective interventions to address mental health issues arising from extreme events, including those involving mass casualties and from longer-term changes, including drought,
    - programs to improve the education and awareness of health professionals about the links between health and climate change, and their understanding of the risks of new vector-borne diseases and their health impacts,
    - measures to prevent exotic disease vectors from becoming established in New Zealand, and
    - preparedness to deal with the temporary and permanent dislocation of people due to climate-related physical events and economic conditions

- Believes that measures which mitigate climate change will also benefit public health. Reducing GHGs should therefore be seen as a public health priority.

- Believes that the risks of climate change associated with increasing greenhouse gas concentrations in the atmosphere need to be addressed through accelerated action. Behavioural change, innovation and technological progress are necessary to achieve emission stabilisation that will secure NZ's future.

Although New Zealand is likely to be shielded from the worst impacts of global climate change, there remain significant risks to the health of our population. For this reason, in addition to our need to act as a responsible global citizen, the NZMA encourages doctors and the Government to consider the recommendations made in this statement.

http://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2014/vol-127-no-1406/6366

SPECIAL ARTICLE

Health and equity impacts of climate change in Aotearoa-New Zealand, and health gains from climate action

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Abstract

Human-caused climate change poses an increasingly serious and urgent threat to health and health equity. Under all the climate projections reported in the recent Intergovernmental Panel on Climate Change assessment, New Zealand will experience direct impacts, biologically mediated impacts, and socially mediated impacts on health. These will disproportionately affect populations that already experience disadvantage and poorer health.

Without rapid global action to reduce greenhouse gas emissions (particularly from fossil fuels), the world will breach its carbon budget and may experience high levels of warming (land temperatures on average 4–7°C higher by 2100). This level of climate change would threaten the habitability of some parts of the world because of extreme weather, limits on working outdoors, and severely reduced food production.

However, well-planned action to reduce greenhouse gas emissions could bring about substantial benefits to health, and help New Zealand tackle its costly burden of health inequity and chronic disease.

Human-caused climate change is a serious and increasingly urgent threat to human health and wellbeing.[1–5] Climate change will cause higher temperatures, extreme weather such as heatwaves, heavy rainfall events and/or drought, intense tropical storms and sea-level rise. It is projected that rising levels of carbon dioxide (CO_2) in the atmosphere will increase the acidity of the oceans by 150–200% by 2100. These changes result in many risks to human health that are recognised by world health and science authorities, New Zealand health bodies, and leading medical journals alike.[2–11]

Globally and in New Zealand, leading health threats include high temperatures and extreme events (direct impacts), changing patterns of infectious diseases and water/food shortages or price changes (biologically mediated impacts), and risks related to economic change, loss of livelihoods and forced migration (socially mediated impacts).[3,12–16]

Without rapid global action to reduce greenhouse gas emissions (particularly from fossil fuels), the world will breach its carbon budget and may experience high levels of warming (4–7°C or higher by 2100).[1,6,17,18] At such levels of warming the Intergovernmental Panel on Climate Change (IPCC) warns that normal human activities (e.g. growing food, working outdoors) will be increasingly compromised in some parts of the world during parts of the year; there will be large risks to global and regional food security; and higher risk of crossing 'tipping points' (thresholds for abrupt and irreversible change) in the earth and interlinked human systems.[6]

However, if well-planned action to reduce greenhouse gas (GHG) emissions were undertaken globally and in New Zealand, there could be substantial positive impacts not only for limiting future climate change, but also for health, equity, and wellbeing.[2–4,19]

This paper reflects the recent Fifth Assessment Report of the IPCC (AR5), and the increased urgency indicated for action to avoid worsening human health impacts from climate change. It also updates both Metcalfe et al's Special Article on climate change and health in the *Journal* in 2009,[12] and Phipps et al's paper on the climate change challenge for General Practice in New Zealand in the *Journal* in 2011.[13]

http://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2014/vol-127-no-1406/6366

Global health impact of climate change

Climate change is already contributing to global disease, disability and premature death—most seriously affecting people in poor countries, and the most disadvantaged and vulnerable within all countries.[2,6,7,20]

By the 2050s, the projected health impacts are extensive (summarised in Box 1).[2] Levels of risk will be influenced by population vulnerability (population health status, age, gender, health infrastructure) as well as the degree of social and economic development within populations during this timeframe.[2]

Box 1. Expected global health impacts with projected climate change to 2050[2]

Health Impact	IPCC Level of Confidence*
Higher risk of injury, disease and death from more intense heat waves and fires	Very high confidence
Higher risk of food- and water-borne diseases	Very high confidence
Higher risk of under-nutrition from lower food production in poor regions	High confidence
Health impacts related to lost work capacity/lower labour productivity in vulnerable populations	High confidence
Higher risk of vector-borne diseases in some areas	Medium confidence
Modest improvements in cold-related mortality and morbidity in some areas	Low confidence
Reduced capacity of disease-carrying vectors (from exceedance of thermal thresholds) in some areas	Medium confidence

* Confidence: IPCC qualitative assessment of evidence (type, amount, quality, consistency) and the agreement of evidence.

Box 1 includes some possible health gains from climate change (e.g. reduction in cold-related morbidity and mortality), but the IPCC has concluded that any positive effects from climate change will be outweighed globally by negative effects.[2,3]

It is important to note that many climate-health risk assessments to date remain conservative (based on lower-range warming scenarios of around 2°C) and consider relatively near-future timeframes (e.g. by 2030 or 2050).[20] However it is becoming increasingly likely that higher levels of warming may occur by 2100.[1,2,17,18] This would lead to environmental conditions (e.g. periods of extreme high temperatures; inability to raise food crops) that threaten human health and wellbeing in large parts of the world.[2,21] Under such scenarios, resources would become scarce and populations may be forced to migrate to other regions, creating risk factors for violence and conflict.[2,22]

Health impacts of climate change in Aotearoa-New Zealand

New Zealand is already experiencing climate change, and more change is expected.[23] According to the projections reported in the AR5, New Zealand will continue to warm over coming decades, and will be wetter in the west and drier in the east and north. Heavier and more frequent extreme rainfalls are expected (with increased flood risk), along with more drought, the duration of drought in the north and east is projected to at least double by 2040.[16,23,24]

There is expected to be more extreme heat (up to 60 more days >25°C in the north by 2090), with increased wild-fire risk. Some of these trends (e.g. increases in heavy precipitation) have already been observed.[16,23,24]

Table 1. Expected health impacts of climate change in New Zealand

Food security and nutrition: Increased global food prices, affecting a large number of locally produced and imported food staples in New Zealand, are likely to reduce the ability of some groups to afford a variety of nutritious foods, further compromising nutritional outcomes for those groups.[2,30–32]
Mental health and suicide: Increased stress and mental health issues (e.g. farmers with drought, victims of extreme weather). Young people may suffer anxieties about catastrophic climate change, not unlike those experienced by children growing up with the fear of nuclear war.[2,33–36]
Housing and health: Healthiness of some housing will be affected by extreme weather, for example, indoor moisture (with heavy rainfall, flooding), high indoor temperatures (during heatwaves in poorly insulated houses).[37] It is also likely that people will arrive in New Zealand from climate-change affected areas. This may put further pressure on availability of low income-larger family homes, potentially impacting household overcrowding and the incidence of some infectious diseases.[14,38,39]
Injury and illness from extreme weather events (e.g. flooding, storms, landslides, storm surges, drought): Immediate trauma, and indirect health impacts in weeks to months after extreme events (e.g. mental health problems, exacerbation of pre-existing medical conditions).[2,40–42]
Heat-related deaths and illness: Increases in heat-related deaths and illness, particularly for those with chronic illness and those aged over 65 years. Heat stress for outdoor workers. Winter deaths may decline, but this is uncertain as winter deaths may be influenced by seasonal factors that are unrelated to climate.[2,43–50]
Vector-borne and zoonotic (animal to human) disease: Increased likelihood that mosquito vectors could establish in New Zealand, which could lead to local transmission of mosquito-borne diseases (e.g. dengue, Ross River virus). Also possible impacts on other vector-borne diseases (e.g. tick-borne) and zoonotic diseases.[2,51–56]
Food- and water-borne disease: Heavy rainfall can lead to contamination of drinking and recreational water/shellfish with faecal pathogens from animals and humans. Both high and low rainfall, and higher temperatures may impact on bacterial and parasitic diseases causing gastroenteritis (e.g. giardiasis, salmonellosis). Dry conditions could affect continuity of household water supplies, impacting diseases influenced by hygiene.[2,56–59]
Ultraviolet (UV) radiation: Climate change may delay recovery of stratospheric ozone. Warmer temperatures could promote increased or decreased outdoor time, affecting exposure to solar ultraviolent (UV) radiation—with possible impacts on rates of skin cancer, eye disease, and vitamin D levels.[2,60–63]
Physical activity: Warmer temperatures, and either increases or decreases in outdoor time, may impact on levels of recreational physical activity—an important determinant of health.[64]
Cardio-respiratory disease from air pollution: High temperatures can exacerbate photo-chemical air pollution with impacts on respiratory disease. Hot, dry conditions increase potential for bush/forest fires, where smoke impacts on people with cardiorespiratory disease.[2,65–68]
Allergic diseases, including asthma: Possible impacts on allergic conditions with changes in plant distribution, flowering, and pollen production.[2,69]
Indoor environment: Climate change may affect the healthiness of indoor environments (e.g. overheating of buildings, changes in indoor air pollutants, flood damage and indoor moisture).[37,70]

Sea-level rise is expected to continue, with an increase in the frequency of extreme high tides and their associated risks, including coastal flooding, inundation, and erosion.[16,23,24]

These climate and related environmental changes have multiple implications for health and wellbeing in New Zealand (Table 1). The magnitude of health impacts will depend on the existing burden of climate-sensitive diseases, the extent and rate of climate change in New Zealand, the capacity of individuals and society to adapt, and the policies chosen to reduce and adapt to climate change.[25]

New Zealand is already affected by a range of diseases that are sensitive to climatic factors,[26–29] and climate trends may well be affecting New Zealanders' health and wellbeing, although such effects are not yet well quantified.[25]

Furthermore, given that global greenhouse gas emissions are continuing to track near the upper end of projections, it will be important to gain a better understanding of the health impacts in New Zealand under high-end scenarios of climate change.[2]

Effects on the determinants of health in Aotearoa-New Zealand

In addition to the health issues listed in table 1, climate change will impact on the broader socioeconomic determinants of health in New Zealand.[14–16]

The economy will be influenced by global climate change.[15] Reduced export income due to, for example, effects on agricultural production (or overseas markets) could lead to higher unemployment, less household money to secure the basics for good health, and a reduced tax-base for health and social spending. An analysis prepared for the Ministry of Primary Industries in 2013 showed that under a high end warming scenario (4.4°C average temperature increase by 2100) there would be a significant decline in dairy pasture production, along with increased dairy cow heat stress in many dairying areas of New Zealand.[71]

However, some positive effects on agriculture/horticulture in New Zealand are also possible.[16,23,71] Thus forward planning and adaptability within the sector will be required to safeguard the economic output of climate sensitive primary industries,[72] which many New Zealanders rely on for good health and wellbeing.

Furthermore, responses to mitigate climate change also have the potential to adversely impact on health. For example, mitigation policies that raise costs for fuel and energy (and therefore increase costs of goods and services) without compensatory measures, could place extra financial burden on people, particularly for low income families, thus affecting ability to afford the basics for good health.[73]

Risks of climate change to health equity and Māori health in Aotearoa-New Zealand

Climate change will cause different impacts for different population groups depending on geographic location, age, ethnicity, health status, and socioeconomic circumstances.[2,25] Māori, Pacific, and low-income groups in New Zealand are at risk of greater adverse health impacts from climate change.[10,14,74]

Māori are at risk of greater impacts (compared with NZ European people) because of a disproportionate burden of disease across many of the health conditions affected by climate change: infectious diseases (e.g. gastrointestinal infection),[75,76] chronic conditions (e.g. cardio-respiratory disease),[75,77,78] and mental ill-health.[75,79,80]

The disproportionately high number of Māori living in deprived circumstances[78,81] means that climate change effects on food security[30,82] and vulnerable infrastructure and housing[25,83,84] will be more difficult to prepare for and recover from–meaning that important determinants of health (such as healthy nutrition, safe drinking water, healthy homes) are undermined.

Any additional pressure on the availability of low income and/or larger family homes resulting from arrival of climate migrants in areas with existing housing pressures (e.g. Auckland region)[14,85,86] would also disproportionately affect Māori who have higher levels of household overcrowding and crowding-related infectious diseases.[87,88] Previous experience in New Zealand has shown that factors that affect the ability of low income families to buy or rent adequately sized houses can lead to families co-habiting, with resultant household overcrowding.[89]

Additional factors which increase climate-health risks for Māori include indigenous relationships with the environment, greater exposure to food-borne disease risk through customary practices such as collection of kaimoana (seafood),[90] greater exposure to outdoor heat whilst undertaking outdoor labour (Māori are overrepresented in semi-skilled/unskilled workforces),[91,92] and poorer access to and through health and social services.[93–100]

Perhaps even more significant are the implications for the economic determinants of health for Māori. The Māori economy is heavily invested in climate-sensitive primary industries;[23,84] and policy responses that place extra financial burden on low income families (disproportionately Māori), without counter-balancing measures, would exacerbate Māori experience of poverty and poverty-related diseases.[73,76]

It is important to note that while this section has focussed on the equity impacts for Māori, many of these issues are also relevant to Pacific peoples in New Zealand and to low income New Zealanders.[10,14]

Health benefits of climate action

The other important link between climate change and health is the substantial opportunity to improve current population health and wellbeing through well-designed policies to reduce greenhouse gas (GHG) emissions.[2–4,19] Knowledge in this area has increased substantially in the last five years, and the health chapter in the recent Fifth Assessment Report of the IPCC included, for the first time, a dedicated section about the health co-benefits of climate action.[2]

Health and health equity gains are possible for heart disease, cancer, obesity, musculoskeletal disease, Type 2 diabetes, respiratory disease, motor vehicle injuries, and mental health, with resultant cost savings for the health system.[2–4,19.]

These co-benefits arise because some emission reductions measures impact on important determinants of health, especially energy intake (nutrition) and expenditure (physical exercise). For example:

- Active transport (walking, cycling, public transport) in addition to reducing CO_2 emissions, improves physical activity and can reduce air pollution and road traffic injuries.[2,101–107] Walking and cycling are inexpensive, and public transport is used proportionately more by people with lower incomes. Thus improved active and public transport infrastructure has the potential to benefit health, climate and equity.[101]
- In New Zealand healthy eating, including increased plant and less red meat and animal fat consumption, would reduce agricultural GHG emissions, and likely lead to reduced rates of bowel cancer and heart disease.[2,108–111]
- Improving indoor environments (e.g. energy efficiency measures such as home insulation) can reduce illnesses associated with cold, damp housing (e.g. childhood asthma and chest infections which are leading causes of hospital admissions, particularly for Māori and Pacific children).[112–114]
- Increasing energy efficiency and/or moving away from fossil fuels would reduce health-damaging air pollution (e.g. particulates) from fuel combustion, in both indoor and outdoor environments, with health gains.[2]

Thus well planned climate action could contribute to significant reductions in the large burden of chronic disease and health inequity in New Zealand, leading to large cost savings for the health sector and society as a whole. This could offset a great deal of the early costs associated with climate change mitigation measures.[2,3]

The New Zealand research community continues to make a strong contribution to the body of knowledge on the health co-benefits of climate action. The housing and health programme (University

of Otago, Wellington) has led the way in quantifying the costs and benefits (including health) of insulation and clean heating.[112,113]

Research at the University of Auckland, using novel modelling techniques, has indicated that transport policy that enables safe commuter bicycling in Auckland has the potential to yield benefits (with respect to injury, physical activity, fuel costs, air pollution, and carbon emissions) that are 10–25 times greater than costs.[107]

The way forward

Rapid and sustained global action to reduce GHG emissions is required to avoid the worst health effects of climate change.[2,115] It is possible to limit the degree of future climate change and to improve health, if the world rapidly upscales carbon-neutral energy production to replace energy production from fossil fuels, along with reducing energy usage, increasing carbon dioxide sinks (e.g. forests) and curbing rising levels of methane and nitrous oxide by modifying our waste management and agricultural/food systems.[4,115]

All individuals, groups, businesses and organisations have a role in reducing emissions, reducing investment in fossil fuels, and demanding that local and central governments act to reduce climate risks in ways that improve health and equity.[4]

Some New Zealand health organisations are beginning to take a lead in addressing their climate-health responsibilities, with action to measure and reduce organisational carbon footprint (Counties-Manukau District Health Board, Canterbury District Health Board), and employment of Sustainability Officers (Counties-Manukau, Waitemata, Auckland and Canterbury District Health Boards). A national network of health professionals interested in collaborating to improve the environmental sustainability of the New Zealand health sector was established in early 2014.[116]

There is much untapped willingness amongst health professionals to improve environmental sustainability within their workplaces (with large potential for operational cost savings),[117,118] but as yet no national framework or mandate to support this, despite a growing international movement and ample international expertise.[119]

There is also a need for the health sector to plan for the inevitable health impacts of climate change in coming decades. Health services should plan for more climate-sensitive diseases, extreme weather events and their casualties, and climate migrants with new and challenging health issues.[10,14,120]

Public Health Services should be strengthened to enable planning and response capability for impacts on drinking water, sewage systems, and civil defence emergencies. Public health surveillance systems need to be in place to detect new and emerging illnesses.[10,120]

It is essential that planning prioritises those population groups most in need of health support in the face of climate change—Māori, Pacific, people on low incomes, migrants, rural people, children, and the elderly.[10] Other events (e.g. Christchurch earthquakes, Hurricane Katrina) have shown that planning is required to avoid an inverse equity pattern in post-disaster responses and outcomes.[121–123]

Outside the health sector, effective public policies are required that both lessen climate risk, and improve population health and health equity. These policies should include an effective carbon pricing system (to replace the largely ineffective Emissions Trading Scheme),[124] while ensuring that financial costs do not adversely affect those on low incomes.[4,73]

Greater investment is required in programmes that both decrease GHG emissions and improve health, such as healthy housing modifications (insulation and clean/efficient heating), active transport infrastructure, and interventions that encourage increased plant and less red meat and animal fat consumption.

One way to encourage this is to ensure that public policy decisions include a health impact analysis, so that potential adverse health impacts can be avoided and positive effects maximised.[125] It is also

critical that any such decisions incorporate an equity analysis, to ensure that the resulting interventions contribute to reducing social and health inequities.

New Zealand must also consider its role in international climate change negotiations and responses. As a high (and growing) per-capita greenhouse gas emitter,[126–128] New Zealand has a responsibility to both increase its own ambitions with respect to greenhouse gas emission reductions, and to promote fair and equitable approaches to emissions reductions globally that take into account historical responsibility and capacity to mitigate.[129,130]

New Zealand, as part of the Pacific, will also need to play a role in supporting the health, wellbeing and adaptation of Pacific Island and other developing nation populations who will face many of the worst health effects of climate change.[131,132]

Conclusion

Climate change poses an urgent threat to human health, wellbeing, and health equity globally, and in Aotearoa-New Zealand.

On the other hand, well-planned action to reduce greenhouse gas emissions offers opportunities to improve population health, equity, and reduce chronic disease burden. This could result in large cost savings for the health sector and society as a whole, which would offset a great deal of the early costs associated with climate change mitigation measures.

As health professionals, we have a responsibility to raise awareness of the health implications of climate change, and to press for urgent action. If we act quickly, we have an opportunity to turn one of our greatest health threats into positive action to significantly improve the health, equity, and resilience of our patients and population.

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Health, fairness and New Zealand's contribution to global post 2020 climate change action

Hayley Bennett, Alex Macmillan, Rhys Jones

The government's current public consultation about climate change presents a rare opportunity for health and wellbeing to enter the public discourse around climate targets and action.

In December, countries will meet in Paris to establish a critical new international climate change agreement.[1] This agreement will strongly influence whether we have a safe planet to live on in the not-too-distant future, and whether our children and grandchildren will be able to enjoy the same level of health and wellbeing as is possible today.[2]

Before Paris, countries are expected to announce their level of commitment to reducing greenhouse gas (GHG) emissions globally—their Intended Nationally Determined Contributions (INDCs). The New Zealand Government is currently consulting with the public as to what our 'fair' contribution should be.[3] The INDC is expected to include specific targets for reducing our carbon and total greenhouse pollutants between now and 2030, longer-term commitments, and specific policy mechanisms to achieve the targets.

A paper published in the *New Zealand Medical Journal* of November last year summarised the current scientific thinking about climate change and its health and health equity implications.[4] It was clear then that there are limits to the amount of average warming that Earth systems can tolerate before thresholds for irreversable change are reached. Average warming of 2°C or more needs to be avoided to safeguard human health and wellbeing for current and future generations. But without rapid global action to reduce greenhouse gas emissions (particularly from fossil fuels), the world is on a trajectory towards high levels of warming, of 4–7°C on average or even higher by 2100.[4] This would lead to uncontrollable levels of climate change for many future generations and pose severe and possibly insurmountable risks to human health and wellbeing.[2]

All New Zealanders will face direct impacts on health in a +4°C climate (floods, storms, heatwaves, infectious diseases), and we will also have to deal with enormous new health and social challenges such as mass population migrations and resource-related global conflict.[4,5] Those that are vulnerable already—Māori, Pacific people, children, the elderly, and those on low incomes—will face the greatest impacts in the short term, but very few people will be immune to the widespread social and health threats.[4]

However, it doesn't have to be that way. A strong global climate deal, if enacted with sufficient urgency, can still avert the most serious consequences of climate change. Swift, decisive health- and equity-centred policies to reduce GHG emissions are not only necessary to limit future climate change, but could also enhance the health, fairness and resilience of our communities today.[4,6] There are significant short- and medium-term health co-benefits to be gained, especially by shifting from cars to active and public transport;[7,8] improving housing energy efficiency and heating;[9] reducing red meat and dairy intake in our diets;[10] and phasing out fossil fuel mining and burning.[11,12]

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The government's INDC consultation document presents climate action as a net cost to our economy.[13] While there are likely to be costs for some groups and industries, the document fails to account for the economic opportunities that are widely acknowledged as societies adapt to a low-carbon world.[14]

Furthermore, Ministry for the Environment officials during the recent public consultation meetings have acknowledged their failure to account for either the health costs of inaction, or the substantial and measurable cost savings for the health sector that could accrue from the health co-benefits of well-designed action. These health benefits need to be included in calculations of costs and benefits of action. The costs of making the needed transition also need to be borne fairly. Policy mechanisms will be crucial for recycling the payments of wealthy climate polluters into support for a healthy transition to a low-carbon world, especially for low-income households.[15]

Climate change is a global issue that requires a collective response. The response must recognise historical contribution to climate change and capability to act, as well as fair sharing of costs. Many of the nations that will be worst affected by climate change have contributed almost nothing to cumulative global GHG emissions, whereas New Zealand has long been one of the highest per capita GHG emitters.[16] As a wealthy, democratic nation with a robust economy and much of the infrastructure needed to further increase our renewable energy generation, New Zealand is in a strong position to make ambitious INDC commitments.

On the basis of contribution, capability and cost, New Zealand has global obligations to set ambitious targets—a total GHG reduction target of at least 40% on 1990 levels by 2030, and a target of zero carbon emissions before 2050. These are the targets determined by the Earth's environmental physics, not by what is seen as politically popular.[17] However, distant targets have little worth unless they are coupled with commitment across the political spectrum and include annual targets and actions. They therefore need to be underpinned by sector-specific policies for meeting the targets that have human wellbeing and social equity at their heart.

This health-centredness of climate policy needs to extend to the global negotiations. We therefore urge the Minister of Health to join other health officials in Paris in December, to attend the Climate and Health Summit that is planned alongside the climate negotiations, and to call for human health and wellbeing to be at the centre of negotiations. This would signal that New Zealand, like other countries, has made the critical link between climate change and health, and is willing to act to protect and promote the health and wellbeing of New Zealanders.[18]

We also urge all health professionals to get engaged in the climate-health issue, and if possible to make a short submission to the Government by the 3 June.[3] A health-focused submission guide provides some suggested key messages to assist health professionals and organisations to make submissions.[19] We have a responsibility to our patients and communities to push for strong, health-centred climate action. In doing so we have the opportunity to turn one of our greatest health threats into positive action to create a healthy, fair and resilient nation.

Competing interests: Dr Hayley Bennett is a part-time paid coordinator for OraTaiao: The NZ Climate and Health Council. Dr Alexandra Macmillan and Dr Rhys Jones are unpaid co-convenors of OraTaiao: NZ Climate & Health Council. OraTaiao is a group of New Zealand health professionals concerned about the health implications of climate change in New Zealand and world-wide.

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