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# Climate Change

## Position paper
## August 2017

the future of rural health

rhw
rural health workforce
AUSTRALIA

The NRHSN is managed by Rural Health Workforce Australia with funding from the Australian Government's Department of Health

## National Rural Health Student Network

The National Rural Health Student Network (NRHSN) represents the future of rural health in Australia. It has more than 9,000 members who belong to 28 university Rural Health Clubs from all states and territories.

It is Australia's only multi-disciplinary student health network, bringing together people studying medicine, nursing and allied health, encouraging them to pursue rural health careers.

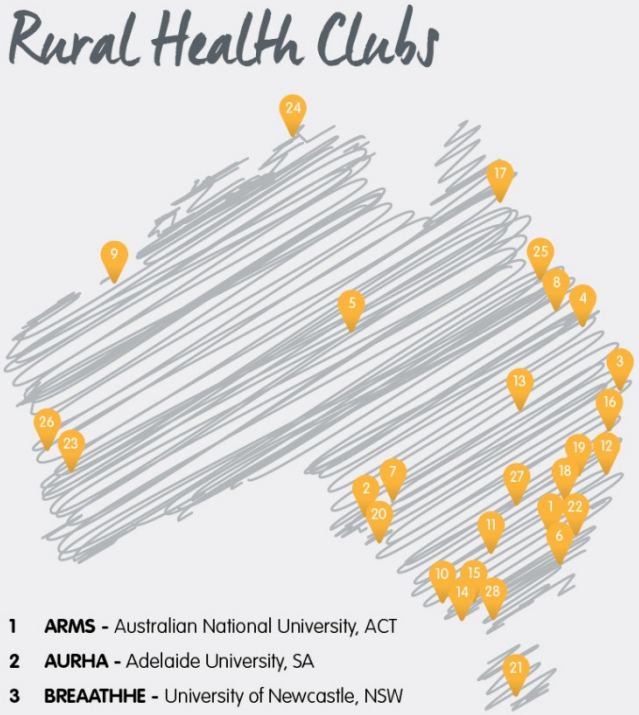
The NRHSN has two aims:

- to provide a voice for students who are interested in improving health outcomes for rural and remote Australians
- to promote rural health careers to students and encourage students who are interested in practising in rural health care.

The NRHSN and its Rural Health Clubs offer rural experience weekends, career information sessions and professional development activities as well as providing a social base for students at university and when on rural placement.

The student network leaders also advocate on behalf of health students of all disciplines - including opportunities for more rural placements and training support.

The NRHSN is managed by Rural Health Workforce Australia (RHWA) with funding from the Federal Department of Health.




1 **ARMS -** Australian National University, ACT
2 **AURHA -** Adelaide University, SA
3 **BREAATHHE -** University of Newcastle, NSW
4 **BUSHFIRE -** Bond University, QLD
5 **CARAH -** Charles Darwin University, NT in assoc with Flinders University, SA
6 **CRANC -** University of Canberra, ACT
7 **FURHS -** Flinders University, SA
8 **HOPE4HEALTH -** Griffith University, QLD
9 **KRASH -** Notre Dame University, Broome, WA
10 **LARHC -** La Trobe University, Bendigo, VIC
11 **MARHS -** Charles Sturt University, Albury, NSW including La Trobe University Wodonga campus
12 **MIRAGE -** University of Sydney, NSW
13 **NERCHA -** University of New England, NSW
14 **NOMAD -** Deakin University, VIC
15 **OUTLOOK -** University of Melbourne, VIC
16 **RAHMS -** University of New South Wales, NSW
17 **RHINO -** James Cook University, QLD
18 **RHUUWS -** University of Western Sydney, NSW
19 **ROUNDS -** Notre Dame University, Sydney campus, NSW
20 **ROUSTAH -** University of South Australia, SA
21 **RUSTICA -** University of Tasmania, TAS
22 **SHARP -** University of Wollongong, NSW
23 **SPINRPHEX -** Combined Universities of Western Australia, WA
24 **StARRH -** Charles Darwin University, NT including Flinders University, SA
25 **TROHPIQ -** University of Queensland, QLD
26 **WAALHIIBE -** Combined Universities of Western Australia, WA
27 **WARRIAHS -** Charles Sturt University, Wagga Wagga, NSW
28 **WILDFIRE -** Monash University, VIC

## Rural Health Workforce Australia

Rural Health Workforce Australia is the national peak body for the seven state and territory Rural Workforce Agencies. Our not-for-profit Network is dedicated to making primary health care more accessible by attracting, recruiting and supporting health professionals needed in rural and remote communities. RHWA is also committed to the future workforce through our support of the National Rural Health Student Network.

### Contact us

National Rural Health Student Network
Suite 2, Level 5, 10 Queens Road
Melbourne VIC 3004
03 9860 4700
info@nrhsn.org.au
www.nrhsn.org.au

# Background

## The Impact of Climate Change on Health

Climate change poses a significant threat to global health and will impact all communities and individuals. The multiple health hazards posed by climate change can occur simultaneously compounding their impact upon health, leading not only to an increase in the frequency and severity of health conditions, but also creating unanticipated health problems where they had previously not occurred.1 Climate change drivers include increasing temperatures, extreme weather events and sea level rise, all of which contribute to extreme heat, poor air quality, reduced food and water quality, changes in the distribution of infectious agents and population displacement. These drivers lead to poorer health outcomes, particularly amongst disadvantaged and vulnerable populations.

## Climate change influences infectious and vector borne diseases

The incidence, prevalence and severity of infectious diseases, particularly vector-borne diseases, has been dramatically influenced by climate change. Climate patterns affect the seasonality and distribution of vector-borne disease, especially in high and low temperature and precipitation extremes.[2,3] Climate variability affects the distribution and density of mosquito species and the replication, bleeding, abundance and survival of viruses such as Ross River Virus and Barmah Forest Virus.[4,5] In tropical northern Australia, rising temperatures, precipitation, cyclonic events and sea level rise are expected to lead to increases in the incidence of diseases such as melioidosis, which can manifest as fulminant pneumonia. Clusters of severe cases often emerge after extreme weather events.[6] Changing weather patterns also hinders efforts to predict the emergence of infectious diseases.[7]

## Climate change influences the spread of Water-Related Illness

Temperature, precipitation, and extreme weather events affect the growth, spread and virulence of water-borne illness. Runoff from extreme precipitation in recreational water and sources of drinking water increases the risk of exposure to agents of water-related illness.[8,9] The infrastructure for drinking water is also affected by natural disasters, leading to increased exposure to pathogens, chemicals and toxins where treatment barriers fail.[10]

## Climate change increases the risk of temperature related death and illness

Increasing levels of atmospheric carbon dioxide and other gases, has led to an increase in both average and extreme temperatures. Since 1910, Australia's climate has warmed by approximately 1°C, with most warming occurring after 1950.[11] According to the CSIRO and Bureau of Meteorology,[11] the number of days with maximum temperatures greater than 35°C has increased within the last 50 years. These extreme temperatures expose communities to heat-related illnesses such as heat stroke and hyperthermia and leads to an increase in hospital admission and mortality, particularly amongst the elderly and those with pre-existing chronic illness.[12] A 10°C increase in maximum average daily temperature is associated with at least a 6-fold increase in heat-related ED presentations,[12] an increase in daily ambulance call-outs and an increase in mental health related hospital admissions.[12,13] The 2009 and 2014 Victorian heatwaves contributed to 374 and 167 excess deaths, respectively.[14] The Climate and Health Alliance[15] warn that the

"increased incidence and severity of heatwaves from global warming could contribute to several thousand additional deaths nationwide by 2050."

## Climate change impacts the air quality and increases the level of air pollutants

Changing weather patterns associated with climate change has significantly influenced air quality. The location and levels of air pollutants such as ground-level ozone and fine particulate matter have been influenced by varying weather patterns, including extreme weather events affecting the severity of bushfires and storms.[16,17] Over two hundred thousand deaths worldwide can be attributed to air pollution from coal fired electricity generation,[18] and the effects of coal-fired power generation on health is estimated to cost Australia AUD $2.6 billion annually.[19] Increasing CO2 levels also promotes the growth of plants that release airborne allergens.[17] Higher concentrations of pollen and longer pollen seasons also increase allergic sensitisation and trigger asthma and related allergic disorders.[20] This, in turn, leads to premature deaths, larger hospital admission rates and lost education/work days. The 2016 thunderstorm asthma event in Victoria caused a 3,000% increase in asthma-related admissions to intensive care, with nine deaths thought to have been attributable to the event.[21]

## Climate change influences individuals Mental Health and Wellbeing

In Australia, mental illness is the largest single cause of disability, accounting for 24% of the burden of non-fatal disease.[22] The consequences of climate change can lead to depression, anxiety, post-traumatic stress disorder and suicidality, due to acute and subacute weather events where individuals are directly exposed to danger, significant injury and death. More frequent exposure to chronic stress due to long periods of extremes of heat can also lead to elevated rates of violence and aggression.[23] The indirect effects of these events include more frequent or severe damage to homes and community infrastructure, as well as damage to livelihoods and disruption of social networks, all exposing individuals to elevated rates of chronic mood disorders and suicidal ideation and attempts.[23] Exposure to climate-related disasters put patients at risk of psychological trauma and the economic and social stress induced by extreme weather such as droughts may lead to depression and suicidality, particularly those in more rural areas.[24]

## Climate change disrupts Food Safety, Nutrition and Distribution

Rising temperatures and weather extremes increase the exposure of food to certain pathogens, contaminants and toxins.[25,26] Food contamination with polychlorinated biphenyls, persistent organic pollutants, dioxins, pesticides, and heavy metals can occur after extreme weather events such as flooding.[27-29] Rising sea surface temperatures has also led to a greater accumulation of mercury in seafood,[30,31] a staple food source in many parts of the world. Rising carbon dioxide levels also alters the distribution of plant pests[32] leading to an increase in the use of pesticides.[33,34] Rising CO2 levels have also been shown to decrease the concentrations of protein[35,36] and essential minerals[37] in most plant species. Damage to infrastructure during extreme weather events can also lead to disruptions in the packaging, transport and storage of food, and may lead to spoilage and contamination, limiting access to safe foods.[38] Events such as droughts and floods also reduce agricultural production outputs leading in severe food shortages on a more global scale, with resulting malnutrition in affected populations, particularly those in developing nations.[39]

## Climate change leads to extreme environmental events that can impact social determinants

The frequency of severe climate events has increased since the mid-20th century, and is projected to continue increasing.[40] For example, very warm monthly maximum temperatures (two standard deviations above the mean) that once occurred around 2% of the time during the period of 1951-1980 increased to 11% of the time during the period of 2001-2015.[11] Much of Australia now also experiences more days with maximum temperatures over 35, with on average, almost 12 more days per year over 35 compared to 1957.[11] This has also lead to an increase in extreme fire weather, and longer fire seasons in many parts of Australia, particularly in Southern and Eastern Australia, since the 1970s.[11] The direct health effects from severe climate events, such as injury and death, are often significant and place a large burden on local health services. Damage to property, destruction of assets and loss of infrastructure such as power, water, transportation and communication systems also place communities at risk. Furthermore, a lack of available public services such as healthcare and emergency response, social and economic impacts and environmental degradation all lead to poorer health outcomes.[41] Populations such as those with disabilities or other functional needs, older adults and those of lower socioeconomic status are often the most affected.[42] In addition to poorer health outcomes, the aftermath often places a significant economic burden on the local and wider community. For example, the estimated health and social costs of the Black Saturday bushfires in Victoria in 2009 and the 2011 Queensland floods totaled AUD $3.9 and $7.4 billion respectively.[43]

## Climate Change and Rural Health

Climate change impacts will be felt earliest by vulnerable communities worldwide including those located in rural and remote communities throughout Australia. Extreme weather events can have a huge impact on rural health stemming from altered temperatures, extremes of precipitation, air pollution and infectious diseases.[44] These extreme weather events have been directly linked to global warming, with a rise in frequency over the last five decades of floods, droughts, cyclones and heatwaves.[45,46]

Increase in mosquito-borne diseases such as Dengue and Barmah Forest Virus poses particular threat to rural community health, especially those located in Northern Australia experiencing a spread in habitable regions for mosquitos.[47] Mosquito-borne diseases affect rural and regional populations at a disproportionately higher rate than their metropolitan counterparts[48] and as such, this consequence from an increase in temperature and precipitation will have a more marked effect on rural Australians.

The severity of bushfires is increased if they occur during extreme heat events. Not only are these an immediate threat to human life and livelihoods, the particulates can be a major exacerbating factor in respiratory conditions as well as cardiovascular and ophthalmic complications.[49]

The secondary effects of climate change on rural health are equally concerning. Communities affected by drought have higher rates of stress and hopelessness, which may in turn lead to mental illness in these rural areas.[50-52] With the frequency of chronic adverse weather events such as drought expected to increase over the coming decades, the mental health of our farming communities are likely to suffer. Rates of anxiety and depression do not vary significantly

between rural, regional, and metropolitan areas of Australia, however rates of suicide in non-metropolitan regions are up to 1.6 times higher.[54] This discrepancy may feasibly be due to an inaccessibility of mental health resources within our rural and remote communities, or the under utilisation of these facilities by rural populations.[55]

These health issues are exacerbated due to the inequity of healthcare amongst the regional, rural and remote populations of Australia. Action on climate change and rural health must be two-pronged; minimising climate change through preventative measures, and improving rural health facilities and support in preparation for the foreseeable adverse changes to come.

## Climate change and Aboriginal & Torres Strait Islanders Health

Literature suggests the health impacts of climate change will occur faster and of greater magnitude in Aboriginal and Torres Strait Islander populations, and may result in loss of homeland, livelihoods and culture in these communities.[55]

Aboriginal and Torres Strait Islanders have almost twice the rates of hospitalisation and chronic disease compared with non-Indigenous Australians.[55] Existing health problems in Aboriginal and Torres Strait Islander communities are now being further exacerbated by climate change. Aboriginal and Torres Strait Islander populations have been identified as a highly vulnerable group to the effects of climate change, due to both disproportionate morbidity and mortality in these groups, and their habituation in rapidly changing regions.[56] Increased ambient temperatures and humidity are associated with deteriorations in physical health and exacerbations of existing health problems like ischemic heart disease, particularly in Aboriginal and Torres Strait Islanders.[57]

The scope for climate change to affect health is broader than just altering incidence and prevalence of disease; it has the potential to impact socio cultural well-being.[57] It is known that the strength of people's connection to "country" has been identified as a protective factor for Aboriginal and Torres Strait Islander peoples' well-being. The alterations to ecosystems that result from climate change will diminish the relevance of traditional culture, and threaten both social and emotional well-being.[58]

There is a need to educate these populations in preventative measures and risk avoidance in light of a changing climate.[55] The social and economic disadvantages faced by Aboriginal and Torres Strait Islanders such as access to education, clean water and housing, increase sensitivity of these populations to climate-related health outcomes.[55] Such living conditions can increase the risk of non-communicable diseases, waterborne diseases and other infections; all of which could have outcomes affected by projected warmer temperatures and increased precipitation.[58] Sustainability of the land and its food sources is also under threat, resulting in a possible increase in the use of processed foods and further exacerbating health problems.[59]

It should be also considered that Aboriginal and Torres Strait Islanders have always adapted to continual climate and ecosystem change. These adaptations have been underpinned by their knowledge of the land and its resources, in conjunction with their strong sense of cultural identity.[58] Aboriginal and Torres Strait Islanders are less likely to benefit

from state-level adaptation, but instead will be pressured to adapt at a personal, household and community level. They may, however, move away from "country" in order to do this. Adaptation programs and policies, if planned carefully in conjunction with mitigation, have the potential to improve health status.[59]

# Positions

1. The NRHSN recognises and acknowledges the scientific consensus that the climate is warming from human activity.
2. Climate change is one of the greatest threats to global health.
3. Climate change will adversely affect Australia's most vulnerable populations, rural, remote, Aboriginal and Torres Strait Islanders, first.

# Recommendations

## Education and Awareness

The NRHSN calls for:

a. universities to establish a national framework for university curriculums, which educates future health professionals on the basics of climate change and the expected impact on health outcomes
b. health services to ensure that health professionals are able to recognize and respond to health impacts of climate change
c. the government to create a national public awareness program on the importance of the environment and the effects of climate change on health, and how to self-manage the symptoms of climate-associated illness
d. the government to increase surveillance on emerging diseases attributed to climate change including outbreaks of infectious diseases to accurately quantify the burden of disease caused by climate change.

## Health Services

The NRHSN calls for:

a. universities and rural health clubs to support programs which encourage active and public forms of transport to reduce emission levels
b. health services to minimise waste and reduce emissions
c. the government to create targeted health programs designed to address multiple and varying exposures, for example, air pollution in those suffering from respiratory conditions such as asthma
d. the government to ensure health services have the resources for, and are prepared to, handle a surge in climate-related illness due to both acute extreme events and long-term consequences of climate change.
e. the government to improve access to healthcare for populations likely to be highly vulnerable to climate-associated illness

## Aboriginal and Torres Strait Islander health

The NRHSN calls for the government to recognize the importance of the connection of land to the health and wellbeing of Aboriginal and Torres Strait Islander people

## Improved Rural Health Care

The NRHSN calls for the government to improve equality in rural and remote Australian health so communities are better equipped to deal with adverse health outcomes due to climate change. This may include:

a. Improving security of food and water access to communities during times of extreme weather events
b. Investing in infrastructure to better cope with acute weather events

## Mental Health Services

The NRHSN calls for the government and health services to improve access to mental health services which can be vital during times of drought and extreme weather conditions.

## Support clean and efficient energy

The NRHSN supports:

a. the Australian Government's Renewable Energy Target to ensure almost a quarter of Australia's electricity comes from renewable sources by 2020
b. The NRHSN supports the Carbon Neutral Program to support businesses in going carbon neutral.

The NRHSN calls for:

c. the government to support programs that will decrease emissions per capita by half in Australia by 2030.
d. the government, health services and universities to invest in renewable energy, energy efficiency and low emissions technologies.

## Support Local Initiatives and Reduce Waste

a. The NRHSN encourages students, associates and Rural Health Clubs to support local businesses where possible.
b. Rural Health Clubs should evaluate or cease the use of high waste merchandise to avoid unnecessary waste and devise the use of environmental/carbon neutral merchandise/promotion options.
c. Rural Health Clubs should promote to their universities to also implement purchasing from local businesses and cease the purchasing of high waste merchandise in favour of no merchandise or environmental/carbon neutral options.

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