NCCARF
National
Climate Change Adaptation
Research Facility

Climate change impacts factsheet:

8. Human health

Australians have first-hand knowledge of how the climate can affect our health through the deaths that occur during heatwaves and floods, and through the mental effects of decade-long droughts on our farming communities.

Climate change has the potential to increase these effects, and to introduce new risks that will affect the health of the population and the management and operation of health care institutions. Total expenditure on health accounts for about 9.8% of Australia's gross domestic product, representing a substantial investment.

The health care system needs to be well-prepared and well-adapted to deal with the spectrum of climate change-related health risks.

Climate and human health

Australia experiences considerable climate variability, with periods of extreme dry weather, heat, drought and flood, all of which can lead to illness, disease, injury and death. The effects of these extremes can be both direct and indirect. Direct effects of extremes include injury and death in floods, and mortality due to heat stress during heatwaves. Indirect effects arise because, for example:

- extreme heat and aridity can lead to bushfires, which can kill and injure,
- extreme aridity and high winds can lead to dust storms that exacerbate respiratory complaints, and,
- high temperatures can affect the incidence of diarrhoeal disease from microbial food-poisoning.

While the health impacts of sudden extreme events in recent years have received high profile attention, nationally we also have increasing concern for the mental health consequences of prolonged drought in rural Australia and its impact on agricultural production, rural livelihoods and community wellbeing and mental health.

Future climate trends

Average surface air temperature has risen 0.9 °C in Australia over the past 100 years, and there have been changes in the distribution, intensity and seasonality of rain and snowfall across most of the continent.

These trends are expected to continue and to be accompanied by increases in the incidence of hot days, reductions in cold days, frosts and snow cover, and a southerly movement of the tracks of tropical cyclones. Increases in the number of extreme heat and extreme fire days have the potential for substantial impacts on human health.

Social and economic impacts

Population health is critical to the social and economic wellbeing of the country. Increases in disease burden, morbidity and mortality have negative social and economic consequences. Catastrophic events can destroy places and disrupt livelihoods and communities. This may then have long-term mental health consequences for those affected.
The people identified as most vulnerable to the health effects of climate change are children, elderly people, Indigenous communities, and people with pre-existing diseases and

Climate change impacts and vulnerabilities

The main health risks from climate change derive directly from changes in the occurrence (frequency and severity) of:

- *Heat waves*. Extreme heat is projected to increase heat-related deaths and hospitalisation rates, and to reduce quality of life and workforce productivity for people who cannot reduce their heat exposure.
- *Extreme weather events* such as drought, flood and windstorm, leading to more injuries and deaths, and indirect effects such as increased incidence of infectious and contagious diseases and depression (see below).

Indirect effects of climate change derive from weather changes that can lead to:

- More outbreaks of climate-sensitive mosquito-borne infections, such as dengue fever, Ross River fever and Barmah Forest virus disease, due to warmer and wetter conditions, and following flood episodes.
- Effects on air quality, because hotter conditions can create more smog, and drier conditions can cause more particle pollution from fires and dust storms.
- More outbreaks of environmental infectious diseases:
  - » Water-borne disease outbreaks may occur when flooding affects water purification and sewerage facilities.
  - » Food-borne disease outbreaks are associated with hotter and more humid conditions.
- Altered food production affecting food pricing and availability. Water shortages will affect food yields, food prices, and food choices in our diet, particularly among low-income groups.
- Social, economic and demographic dislocation, for example during floods. Displacement of communities may lead to stress, tensions and mental health impacts. Declining rural incomes from agricultural production will bring flow-on impacts which may affect quality of life and mental health.

The resulting surge in demand for primary and acute health care will impact on the provision of health services.

disabilities. They will require particular attention in the development of adaptive strategies.

Adaptation: practices, options and barriers

Adapting to climate change impacts should be considered in strategic health service planning. The health care system, and the community, need to be prepared to deal with the spectrum of climate change-related health risks. Increases in sickness and disease will place a greater strain on health care services, particularly with an ageing population. Disaster preparedness, and health care surge capacity (the ability to respond adequately to a sudden and unexpected disaster), will be vital for effective responses to extreme weather events.

As 90% of Australian people live in cities and large towns, the urban environment is an important determinant of health for most people. There are opportunities to develop the co-benefits for health from adaptation initiatives. For example, improving public transport will reduce carbon emissions, improve air quality, and provide more opportunity for exercise from active modes of transport – walking, cycling and mass transit.

Adaptation includes infrastructure planning. Power and water systems must be able to withstand catastrophic events and, where they fail, systems need to be in place to effect repairs quickly.

Policymakers should be alert for unintended consequences of adaptation. For example increased use of domestic water tanks in cities and towns has the potential to increase risk from mosquito-borne disease. This is not an argument against distributed water systems; rather it highlights the need for public health perspectives to be considered in climate change adaptation in sectors other than health.

Costs

The costs of preventive health actions are always lower than dealing with the consequences. The same is true for the health effects from climate change. The economic costs of adaptation strategies can be minimised if new approaches are carefully considered and integrated alongside other planned changes.

Research priorities

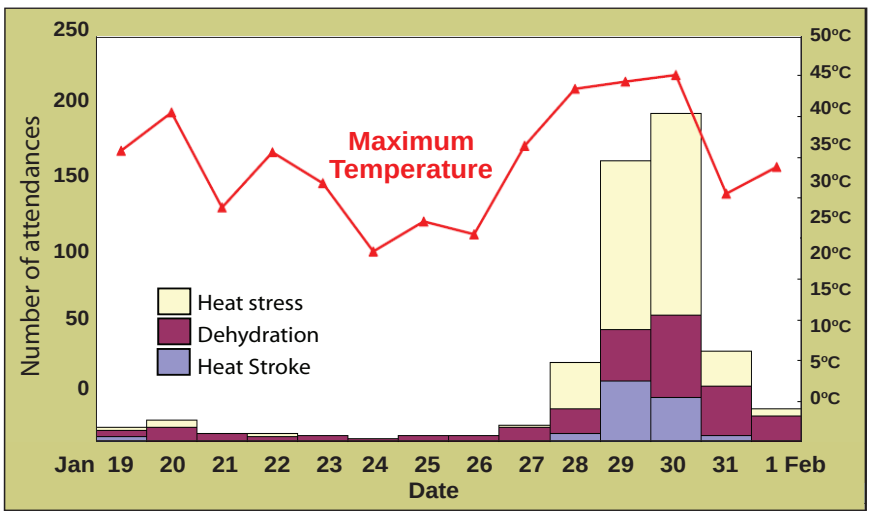
The priorities are documented in the National Climate Change Adaptation Research Plan for Human Health. They include:

- Community and individual vulnerability to short-term extremes of heat and the effectiveness of early warning systems.
- Does public education about the risks of extreme events, and their avoidability, alter people's knowledge and behaviour?
- What are the future risks of arbovirus diseases arising from climate change and can long-term weather forecasting provide useful warnings of vector-borne diseases?
- Where will climate change impacts on food safety and quality be observed and the risks reduced?
- Interventions to minimise adverse mental health effects of natural disasters.
- The impact of climate change and changes in the occurrence of extreme events on Indigenous communities and how community resilience can be increased.
- Models of how health services and infrastructure can both adapt to climate change and assist the community adapt to climate change.

About the Network

The Climate Change Adaptation Research Network for Human Health is hosted by the National Centre for Epidemiology and Population Health at the Australian National University. The Network involves researchers from a range of disciplines – epidemiology, climate science, environmental science, rural and urban studies, sociology, economics, mental health, infectious diseases, physiology, health promotion, health services – and research users from policy, practice, industry and the interested community. Research users are encouraged to help scope and plan research projects, guide research effort, and orient outputs to be useful in decision-making. For more information visit http://www.nccarf.edu.au/humanhealth

Ambulance call-outs for heat-related illnesses in metropolitan Melbourne during the 2009 summer heatwave



- January 27-31 2009: maximum temperatures 12-15°C above summer average.
- January 29-30 2009: 60% increase in ambulance call-outs 126 out-of-hospital deaths vs. 44 expected deaths.

Source: Ambulance Victoria and *January 2009 Heatwave in Victoria: an Assessment of Health Impacts,* State of Victoria 2009.