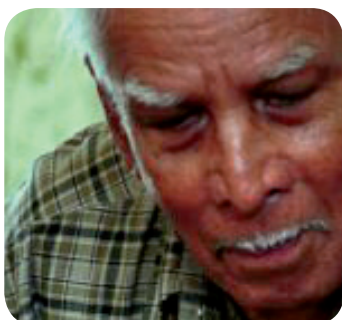


# Climate Change and Vulnerable Groups

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# Climate Change Adaptation and Vulnerable Groups

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## 1. Introduction

In Australia, as elsewhere, there is a great deal of climate change relevant activity at organisational, local, state, and national levels. There are high levels of community awareness of climate change but not yet high levels of consensus on what needs to be done and by whom. The work of thinking through what is appropriate for our existing social institutions to do, how they need to change and what new institutions are required is a 'work in progress' and will remain so for quite some time.

There are now many books and reports on this issue, for example Flannery (2005). Primary health care is as involved with this process as much as any other sector.

Institutional change can be thought about as change to: what organisations at multiple levels need to know, what they need to be able to do, and what 'rules' they need to play by in the broader system including how they need to relate to one another (for theory about institutional change see the work of Scott 2001). In other words:

- What do primary health care people need to know about climate change and its health and social effects?
- How do organisational priorities and processes, programs of work and specific work practices need to change to accommodate the imperatives of climate change?
- What are the appropriate 'rules' (including the norms and expectations of people working in and between organisations, and accountabilities) that are appropriate in a response to climate change.

None of these elements of institutional change are glaringly obvious because they are a challenge to the primary health care world that we take for granted. Typically we puzzle them out, piece by piece, and make changes over a period of time. Our capacity to cope with, and adapt to climate change will develop incrementally, but let us hope not too slowly!

Responses to the problem of climate change are typically classified into coping, adaptation and mitigation strategies.

*Coping mechanisms are the bundle of short-term responses to situations that threaten livelihood systems, and they often take the form of emergency responses in abnormal seasons or years...Coping mechanisms are more likely to emerge at the level of the individual and the household and at smaller spatial scales (Berkes and Jolly 2001:19).*

Coping strategies are the ways people invent to maintain their livelihood in adverse circumstances. They do not suggest deep changes to a culture, lifestyle or social institutions.

*Adaptive strategies, on the other hand, are the ways in which individuals, households and communities change their productive activities and modify local rules and institutions to secure livelihoods. ... adaptive strategies, which are related to variables such as cultural values that change more slowly, are more likely to emerge at larger spatial scales (Berkes and Jolly 2001:19).*

Adaptive strategies are changes to 'ways of doing business', to priorities and to organizations that develop and consolidate in a community over a period of time.

Mitigation strategies are those that seek to reduce the production of greenhouse gases or to increase their removal from the atmosphere. It is the most 'upstream' response to climate change. Garnaut (2008:62) defines mitigation as 'a reduction in the source of, or enhancement of the sinks for, greenhouse gases'. Mitigation requires global economic and social change that is manifest in the behaviours of citizens and organizations everywhere to reduce their production of greenhouse gases. Major institutions such as governments create the environment in which organisations and individuals under its influence change fundamental economic and social activities.

Primary health care organizations need to work with their communities to enhance coping with immediate situations as well as to adapt their service and to assist the community adapt to the long-term and serious consequences of climate change. They also have a role at the local level in mitigation initiatives. How primary health care goes about these tasks is evolving but it can be assisted by key resource documents in the primary health care field such as the Declaration of Alma Ata (1976) and the World Health Report 2008 (World Health Organization 2008b) (Walker 2009).

In this report I will review literature that enhances our understanding of the problem of climate change, how we can understand better the task of responding to it, and some practical strategies that can help the SE CHP adapt to climate change and minimise the potential impact on vulnerable groups in its community.

# 1. Environmental changes expected in Victoria

This section summarises the key effects of global warming (climate change) that will require change in the Victorian community. Two key points need to be made at the beginning. First, there is a literature in a number of disciplines including archaeology, geography and history demonstrating that the climates in which civilisations have flourished and declined have changed as a consequence of both natural processes and human activity (for example, Diamond 2005; Nunn 2007). Second, scientists are increasingly confident that a very substantial part of the current global warming event is caused by human activity, in particular burning of fossil fuels for energy (IPCC Synthesis Report of 2007 cited by Gardiner 2008; Garnaut 2008). Both natural and human induced climate change create the same environmental effects to which we must adapt. Where human activity contributes to global warming we must also change the activities (mitigation) that contribute to the changes in climate.

When we think about responding to climate change we need to consider two drivers of change:

- Climate change itself – e.g. changes in temperature, rainfall, vegetation and habitat
- Climate change adaptation/mitigation strategies – e.g. a carbon trading scheme or deregulation of utility prices (Chapman & Boston 2007)

Overall the consequences of climate change will be: rising temperatures, more heat waves and bushfires; less rainfall and drier environments; sea level rises and coastal flooding (Gardiner 2008:10). The flow on effects of these changes will impact significantly on, for example, agriculture and food production; on infrastructure such as power generation, transport and housing; on ecosystems and the geographic distribution of plants and animals including those used in agriculture; on the distribution of jobs and the ways work is performed; and, on the frequency and distribution of severe weather related events including floods, bushfires and storms with associated damage to human life and infrastructure.

Within the Port Phillip and Westernport region the impacts of climate change are:

- Rising temperatures. Average temperatures have already increased 0.4C above pre 1990 averages and this is likely to at least double by 2030. By 2070 Melbourne's average temperatures are likely to be similar to those currently found in Echuca. There will be more hot days and more extreme fire danger days.
- Declining rainfall. Rainfall has already decreased by 14% below pre-1990 averages. By 2070 Melbourne's rainfall is likely to be similar to that of present day Seymour. Less rainfall and drier soils will lead to changes in agricultural practices and production.
- The weather will become more variable with more heavy rain, more dry spells, and more storms.

- Sea levels will rise producing coastal flooding enhanced by more major storm events (Department of Sustainability and Environment 2008).

## 2. Social issues to be considered

### Our ancestors' experience of climate change

There are a small number of historical studies of climate change and the consequences for human societies. The most widely known is Jared Diamond's book *Collapse: How societies choose to fail or survive* in which he pieces together evidence from archaeology, history, biology and other disciplines to tell the story of the rise and decline (sometimes extinction) of civilisations as a consequence of their relationship with their environment (Diamond 2005). Australia has been through periods of natural climate change, for example the AD1300 Event in which climate cooled substantially over a 50 to 100 year period, that archaeological evidence suggests impacted on food availability and human population distribution on the eastern seaboard (Nunn 2007; Nunn et al 2007). Greenland, one of Diamond's case studies, is a source of evidence for researchers to explore the interactions between climate and human activity, and the consequences, over a period of 1,000 years. There have been at least two waves of human settlement and extinction in Greenland that are related to the combination of natural environmental change and unsustainable human use of environmental resources (Hamilton, Lyster & Otterstad 2000). Hamilton, Lyster & Otterstad (2000) conclude their detailed study of climate, society and economy in modern Greenland, a country grappling with the collapse of its fishing industry, with two broad observations. First, they argue, many of the impacts of climate change on humans are a consequence of the interaction between climate and human use of environmental resources. However, the complexity of the interaction makes it difficult to identify the most appropriate responses that will sustain both people and their environment. Second, they argue, climate change creates costs and benefits that are distributed unevenly. 'Geographical advantages, human resources and government decisions can influence how different people and places fare when their environmental regime shifts' (Hamilton, Lyster & Otterstad 2000:210). When communities engage with the change process it can make a very significant difference.

### Social model of health

In primary health care we often use the concept called the social model of health to analyse problems, and design interventions, in systematic ways. In the social model of health individuals are located in the context of their small group and family, which is in turn located in the context of its community, which is part of a wider society. Soskolne and Bertollini (1998) use a comparable model to conceptualise human relationships with the environment. They write of three levels, called 'domains of integrity', each forming the context for the domain below it. The domain of the individual is at the centre, located in the context of social arrangements, in the context of ecological conditions. As in the social model of health, the domains of integrity are connected to each other. Soskolne & Bertollini (1998) argue that:

*the domains are related to one another and... disharmony in the relationships can be damaging for the overall system. It is possible to solve a problem at a local or individual level but create negative effects at the social and/or ecological levels. For example, spraying DDT for malaria control can reduce the immediate hazard posed by mosquitoes to local populations but has also created a potential endocrine disruptor with far wider effects (Soskolne & Bertollini 1998:8). The 'good choices' are those that do not create unwanted effects in any of the domains (Walker et al 2005:277).*

Good choices in regard to climate change benefit individuals and societies without harming the environment.

## Re-conceptualising drought in Australia

Drought of increased intensity and frequency is one of the predicted effects of climate change in Australia (Gardiner 2008). The environmental condition of drought has serious social, emotional, and economic effects on communities, especially those economically dependent on agriculture, and the effects cannot be readily disentangled. Drought in rural communities is the climate change issue relevant to health that has been most studied in Australia.

Drought can be considered, from one perspective as a 'chronic stressor akin to natural disaster experienced over a longer time' (Sartore et al 2008:2). The implication of viewing drought as a 'natural disaster' is that it is an event that needs to be coped with now and in the immediate future. From another perspective drought can be viewed as a problem of dryness and the appropriate response is about adapting to 'living with dryness' (Drought Policy Review Expert Social Panel 2008).

*Catastrophic events such as earthquake or flood have immediate and identifiable consequences. The nature of prolonged dryness is insidious. Dryness has both a physical and social component. It represents a time of major upheaval in rural families and for rural communities which unfolds over a number of years and requires a different set of intervention strategies (Drought Policy Review Expert Social Panel 2008).*

From a primary health care perspective it is necessary to work with drought affected communities to support coping with the short-term crisis and to assist adaptation to the long term drying of agricultural regions. Coping assistance occurs during the drought to deal with the immediate problems and may include income support, legal assistance, outreach health services, for example. Adaptation assistance occurs during good times to assist the sector to become more efficient economically, use more environmentally appropriate farming practices, and to change long-term approaches to rural living (Drought Policy Review Expert Social Panel 2008). The expert social panel argues that:

*Human support services have the potential to play a vital role in the long-term sustainability of rural areas. However, in future, such services must move away from crisis-framed responses to dryness and instead more towards longer term sustainable approaches. Human support service delivery which is focused on short-term interventions at the crisis end is an inadequate piecemeal response to what are fundamentally on going problems. ... A longer-term*

*approach would allow human support services to focus on early intervention and the ongoing wellbeing of farm families and rural communities (Drought Policy Review Expert Social Panel 2008:37).*

One important adaptive response recommended by the Drought Policy Review Expert Social Panel (2008) is the preparation, by each farming family, of a health and wellbeing plan in which the potential effects of dry periods on the family business and on the social, economic and mental health of women, children and the family unit are considered. Systematic use of a strategy such as this, using both community and family level dialogue, could be a vehicle to promote adaptive change in these communities. Having made the point above, it remains realistic for communities to expect that primary health care services will respond to crises, to help people cope, but not at the expense of long-term strategies that help people adapt. Furthermore, efforts to reduce the production of greenhouse gases and hence prevent the worst effects of climate change are a fundamental preventive public health strategy.

Arguably, drought stricken rural communities in Victoria are the first sector to experience high levels of environmental and social stress from climate change. Many lessons learned by primary health care agencies in drought-affected areas of rural Victoria can be adapted by agencies in other localities.

## Social inequality

Garnaut (2008:139) argues that '*the adverse health impacts of climate change will be greatest among people on lower incomes, the elderly and the sick. People who lack access to good and well-equipped housing will be at a disadvantage.*' People who are economically vulnerable will experience the greatest impact from rising utility prices, increasing cost of carbon intensive products including food and transport, and from the effects of economic restructuring on employment. People on low incomes have the least capacity to switch to a low- carbon lifestyle by purchasing low energy appliances, green vehicles and retrofitting households to save cooling and heating costs (Garnaut 2008:388). People living in the outer suburbs dependent on private transport to access work and services will be vulnerable to rising petrol prices and the effects, for example social isolation, of reduced mobility. Low-income people in rental accommodation will also be vulnerable to the consequences of landlord resistance to retrofitting rental properties (Garnaut 2008:390). It is also possible that people whose first language is not English will be disadvantaged in their access to information about, and support for, the transition to low energy resources.

The United Nations Children's Fund (UNICEF) (2008:x) argues that children comprise '*one of the populations that are most vulnerable to climate change*'. The logic is that children are the group at most risk from poor nutrition and common infectious diseases and that these two risk factors are directly influenced by climate change. Furthermore, the provision of household energy, sanitation, water and education are influenced by the '*chronic prevalence and severity of natural disasters*'. As floods, bushfires and even drought become more common and severe children will be affected disproportionately. There is some evidence for this in the literature on drought in Australia and its impact on farming families (for example, Drought Policy Review Expert Social Panel 2008:7).

There has been a significant amount written about the effects of climate change on Indigenous communities in Northern Australia, very little about Indigenous people in Southern Victoria. However, in Victoria Indigenous people constitute one of the most disadvantaged groups in terms of income, housing and other social determinants of health. For this reason they are a population group very likely to experience the consequences of climate change, described by Garnaut (2008), for disadvantaged groups.

## Community resilience

The term resilience is increasingly used to describe qualities of, and processes in, communities that are able to successfully adapt as their environments change. Resilience has been defined as:

*The capacity for successful adaptation, positive functioning or competence ... despite high risk status, chronic stress, or following prolonged or severe trauma (Sonn & Fisher 1998:458).*

Landau (2007) is more specific in her definition of community resilience. She argues that:

*Community resilience [is] the community's inherent capacity, hope, and faith to withstand trauma, overcome adversity, and to prevail, with increased resources, competence and connectedness (Landau 2007:352).*

Landau (2007) has also developed a community intervention model (the LINC Model Of Family and Community Resilience) intended to assist stressed communities to utilise their existing resources for adaptation.

Resilience can be associated with individuals (the personal qualities people reveal in their responses to stress), small groups (interpersonal relationships that support appropriate responses to stress) or communities (the social structures, culture, and physical resources that are available to communities at times of stress) (Sonn & Fisher 1998). The qualities of individuals, small groups and communities that facilitate an appropriate response to stress are referred to as adaptive capacity.

Norris et al (2008) argue that resilience is a process that links the adaptive capacities of individuals, groups and communities, to the outcome of successful adaptation. A feature of a resilient process is the linking, or networking, of resources that are the adaptive capacities of a community. Landau's LINC model is fundamentally a process of community mobilisation to utilise 'natural support systems' existing within a community prior to the stressful events occurring (Landau & Weaver 2006:12). The LINC model has been used to help communities deal with many kinds of stressors, for example, high rates of illicit drug use, natural disasters, terrorist attacks, economic stress and crime.

Networking of resources through service coordination, integrated health promotion, chronic disease management and partnerships is the strength of Primary Care Partnerships in the community response to climate change. The indicators of successful adaptation are psychological wellness of individuals and population wellness (for a discussion of what these indicators mean in practice see Norris et al 2008:133).

When climate change is the source of stress then resilience is called into play in response to disasters (storms, fires, floods that will become more frequent), in adaptation to the impacts of a changing climate on the physical, social and economic environments, and adaptation required by the policies and programs intended to mitigate human causes of climate change.

Below is a table with the aspects of people and communities that contribute to community resilience. In practice each of the major adaptive capacities is related to the others.

**Table 1. The adaptive capacities that need to be linked to create community resilience (adapted from Norris et al 2008:136).**

Major adaptive capacities	Components of the adaptive capacities
<b>1. Economic development</b>	<ul style="list-style-type: none"> <li>• Fairness of risk &amp; vulnerability to hazard</li> <li>• Level and diversity of economic resources</li> <li>• Equity of resource distribution</li> </ul>
<b>2. Social capital</b>	<ul style="list-style-type: none"> <li>• Received social support</li> <li>• Expected social support</li> <li>• Informal community ties</li> <li>• Organisational linkages and cooperation</li> <li>• Citizen participation – leadership &amp; roles (formal community ties)</li> <li>• Sense of community</li> <li>• Attachment to place</li> </ul>
<b>3. Community competence</b>	<ul style="list-style-type: none"> <li>• Community organization and action</li> <li>• Critical reflection &amp; problem solving skills</li> <li>• Flexibility and creativity</li> <li>• Collective empowerment</li> <li>• Political partnerships</li> </ul>
<b>4. Information &amp; communication</b>	<ul style="list-style-type: none"> <li>• Story telling about the community</li> <li>• Responsible media</li> <li>• Communication skills and infrastructure</li> <li>• Trusted sources of information</li> </ul>

Efforts to enhance community resilience should focus on the major adaptive capacities and their components. The community can build and increase its capacity to learn and adapt to environmental change but that change needs to be orderly and constructive (Berkes and Jolly 2001:19).

The LINC model uses a three-stage process that would be familiar to people working in community building roles (Landau & Weaver 2006).

- Organising the community, assessing and mapping existing resources, and seeking permission for outside involvement. In this stage links across the community are established or affirmed, clear goals and realistic tasks identified and sustainable work groups for each established.
- Regular meetings with external resource people and organisations are held to implement collaborative action. As goals are accomplished external people gradually retreat to an observer role.
- Creating and evaluating long term support programs. Ultimately outside professionals withdraw.

### 3. Health Changes expected in Australia

Climate change will have variable effects on localities and populations. However, on balance it is expected that the harmful effects on health will outweigh the beneficial effects (World Health Organization 2008a). In the medical literature there are 10 major categories of risk for health resulting from climate change (Horton et al 2008).

**Table 2. Health risks from climate change**

Main categories of risks to health (Horton et al 2008:10)	Elaboration on the risks *
Health impacts of extreme weather events (floods, storms, cyclones, bushfires etc)	Extreme events cause injury to people, damage to infrastructure (e.g. power, buildings – homes, community facilities and businesses, and water services) and economic activity, leading to contamination and disease, social and economic dislocation and the mental health effects of trauma. The recent bushfires are one example.
Health impacts of temperature extremes, including heat waves	Heat waves are becoming more common leading to increased morbidity and mortality. Effects vary with duration, timing in the season and vulnerability of the population. People who are very old, very young or frail are most at risk.

Vector-borne infectious diseases (e.g. mosquito -borne dengue fever, Ross River virus)	Changing climate may change the distribution of these diseases. Poorly implemented adaptation measures, such as inadequately designed domestic water storage may also increase the availability of habitat for mosquitoes
Food borne infectious diseases (including from Salmonella, Campylobacter and many other microbes)	Plants and seafood are more likely to take up toxins from bacteria and fungi. As ambient temperatures rise so do notifications of Salmonella cases.
Water-borne infectious diseases and risks from poor water quality	Droughts may lead to declines in the safety of water supplies. Floods frequently lead to their contamination with pollutants and infectious agents.
Diminished food production: yields, costs/affordability, nutritional consequences	Drought impacts on food production, food costs and food security for vulnerable population groups. It also impacts on the economic and social circumstances of food producers and their communities.
Increases in urban air pollution (e.g. ozone), and interactions of this environmental health hazard with meteorological conditions thereby increasing the risk to health	If air pollution becomes more severe there are likely to be increases in cardiac and respiratory conditions.
Increased production of aeroallergens (spores, pollens), thus exacerbating asthma and other allergic diseases	Increased temperature and CO2 enhances the growth of some allergen producing plants and fungi.

\* Sources used are: Department of Human Services (2007); Russell et al (2009);

Health impacts will vary across 'regions, communities and demographic subgroups' reflecting

- Differences in location (geographic)
- Socio Economic Status
- Preparedness
- Infrastructure
- Institutional resources
- Local adaptive strategies (Garnaut 2008:139)

Local health responses to climate change need to take into account population characteristics, local resources and the history of action on social and environmental health issues. There is no one set of actions applicable everywhere.

## 4. Community perspectives on climate change

Recent attitude surveys of Australians consistently show widespread awareness of climate change and high levels of concern (Collins 2009). Over 80% of Australians believe climate change is occurring, approximately 50% are extremely or very concerned about it, and over 60% believe that energy production and use is causing climate change (Collins 2009:7). These are high levels of awareness. Awareness is the first, and essential, step towards behaviour change.

Sustainability Victoria commissioned a survey of Victorians' attitudes and behaviours in relation to the environment and climate change in early 2008. It resulted in the *Green Light Report: Victorians and the Environment in 2008 (Sustainability Victoria 2008)*. Below I will summarise some of the key findings. For information on the important differences between population segments and specific behaviours it is worth looking at the full report available on the Sustainability Victoria website at [www.sustainability.vic.gov.au](http://www.sustainability.vic.gov.au).

Informants' level of knowledge about climate change was encouraging. Twenty two percent considered themselves 'well informed', 56% 'fairly well informed' and only 21% 'not well informed'. The groups most likely to consider themselves 'not well informed' were people under 35 years of age and blue-collar workers (Sustainability Victoria 2008:11).

Sixty nine percent of Victorians were 'very concerned' or 'fairly concerned' about the environment, only 16% were 'not concerned'. Males were more likely than females to be 'not concerned' particularly young males (15-24 years), students and blue-collar workers. Females were more likely than males to be concerned about the environment. Water availability was most frequently identified as the most important environmental issue followed by other climate change issues.

Respondents were asked if they had performed a limited number of sustainable behaviours during the preceding 12 months.

**Table 3. Selected sustainable behaviours over the preceding 12 months (Sustainability Victoria 2008:12).**

Behaviour	% ever done that
Turned your television off at the power point when you're not watching it	49
Taken a shower of 4 minutes or less	86
Avoided using plastic bags to carry shopping home	84
Avoided buying products with lots of packaging when doing the shopping	63
Talked to your friends about how to be more environmentally friendly	58
Purchased fruit or vegetables that are grown locally in Victoria	65
Grown your own fruit and vegetables	42
Reduced your consumption of red meat	29
Usually use a motor vehicle for short trips of 2 km	53
Usually walk, cycle or use public transport for short trips	46
Connected to green power scheme	24

By and large the table above reports the good news. In general the behaviours frequently undertaken are those that have received widespread publicity over a period of time. Households still use large amounts of energy and have multiple motor vehicles. Once again these characteristics are unevenly distributed across the community. In regard to household heating, for example, those on higher incomes were less likely to consider energy savings (Sustainability Victoria 2008).

A very high proportion of Victorians expressed attitudes conducive to environmentally relevant behaviour change. Ninety percent thought they could do something about the environment and 82% thought it was worth doing so. Sixty six percent would like to make their homes more environmentally friendly but were concerned about the cost of doing so (Sustainability Victoria 2008:10). Although attitudes towards climate friendly behaviours are positive (community attitudes are conducive to behaviour change initiatives) current actual behaviour is not so encouraging (there is a lot of work to be done to achieve widespread climate friendly lifestyles in the community).

## 5. Expected changes and their implications for primary health care: Storylines

A storyline is a way of presenting a very brief scenario that captures the logic of some of the changes our communities face and some responses that health services may consider. They are a device to help us think about the possible consequences of climate change and our responses to it, and to consider the implications for Primary Care Partnerships and their member agencies.

Storylines can also be used in community education in which case the health promotion workers and community members would jointly develop a storyline as an early step in a community action project (Ebi & Semenza 2008).

### Storyline 1. An adaptation story line – rising cost of carbon (Garnaut 2008)

Chain of effects	Potential responses
<ul style="list-style-type: none"> <li>A carbon trading scheme raises the cost of electricity, transport and food</li> </ul>	
<ul style="list-style-type: none"> <li>Greatest impact in on the poorest people</li> </ul>	<ul style="list-style-type: none"> <li>Income support and help with household adaptation</li> </ul>
<ul style="list-style-type: none"> <li>Less money for food, transport, heating, cooling and adaptation</li> </ul>	<ul style="list-style-type: none"> <li>Health promotion regarding changing diet – eg eating less meat, food gardens,</li> <li>Reduced household energy use</li> </ul>
<ul style="list-style-type: none"> <li>Health effects of poverty</li> </ul>	Services for the effects of poverty

One of the economic tools likely to be used to reduce energy is an increase in its price. There will be health consequences of using this policy tool.

### Storyline 2. A climate change story line – rising temperature and heatwaves

Chain of effects	Potential responses	Scale
Increase in the number of very hot days		
Vulnerable groups <ul style="list-style-type: none"> <li>→65 years, living in the community and isolated</li> <li>Chronic illness</li> </ul>	<ul style="list-style-type: none"> <li>Modify the environment eg increase shade</li> <li>Strengthen chronic disease self management programs</li> <li>Audit and retrofitting of low SES homes</li> </ul>	<ul style="list-style-type: none"> <li>Adaptation</li> <li>Coping/adaptation</li> <li>Adaptation</li> </ul>
Effects on individuals <ul style="list-style-type: none"> <li>Heat exhaustion</li> <li>Exacerbation of symptoms</li> </ul>	<ul style="list-style-type: none"> <li>Opening windows in the evening</li> <li>Monitoring clients in the community</li> <li>Creating cool rooms in houses</li> </ul>	<ul style="list-style-type: none"> <li>Coping</li> <li>Coping</li> <li>Adaptation</li> </ul>

More frequent heatwaves is one of the most researched health risks of climate change. In this storyline the scale of the potential response is included.

Coping responses are short-term responses to risks, tend to occur at the individual, household or small community scale, and may require service coordination from agencies.

Adaptation/mitigation responses are long-term changes to productive activities, ways of living and social institutions, that occur at individual, household, small and large scale communities, and may require sustained inter-sectoral collaboration between agencies.



### Storyline 3. An emergency storyline - Extreme weather event: flood

Chain of effects	Potential responses
Heavy rain and flooding of an urban area	
<b>Vulnerable groups:</b> <ul style="list-style-type: none"> <li>• People living in low-lying areas</li> <li>• People whose lines of communication have been cut</li> </ul>	<ul style="list-style-type: none"> <li>• Assessment of those at risk and their location</li> <li>• Activation of coordinated emergency response plans</li> </ul>
<b>Effects on individuals:</b> <ul style="list-style-type: none"> <li>• Injury</li> <li>• Shortage of food and water</li> <li>• Stress</li> <li>• Loss of property</li> </ul>	<ul style="list-style-type: none"> <li>• Medical/nursing services for the injured</li> <li>• Coordination of supplies and catering</li> <li>• Organisation of community peer support</li> <li>• Provision of material aid</li> </ul>
<b>Effects on community:</b> <ul style="list-style-type: none"> <li>• Economic disruption</li> <li>• Damage to infrastructure</li> <li>• Social stress</li> </ul>	<ul style="list-style-type: none"> <li>• Emergency relief payments</li> <li>• Repair work based on need</li> <li>• Community organization to address basic needs and opportunities for community conversation and storytelling</li> </ul>

This storyline describes a basic emergency response but with community resilience elements made explicit, for example, equity in the commencement of infrastructure repairs, community organisation and storytelling.

### Storyline 4. A mental health storyline - Community stress

Chain of effects (Fritze et al 2008)	Potential responses*
Economic decline of carbon intensive industry	
<b>Vulnerable groups</b> <ul style="list-style-type: none"> <li>• People who lose their jobs</li> <li>• Low skilled unemployed</li> <li>• Unemployed people in communities with limited adaptive capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Income support</li> <li>• Skills training and social support</li> <li>• Facilitation of social capital development and community competence particularly political partnerships for economic development</li> </ul>
<b>Mental health effects on individuals</b> <ul style="list-style-type: none"> <li>• Reduced personal autonomy</li> <li>• Negative self perception</li> <li>• Stress</li> <li>• Insecurity</li> <li>• Social isolation</li> </ul>	<ul style="list-style-type: none"> <li>• Counselling</li> <li>• Peer support</li> <li>• Social inclusion programs</li> <li>• Mental health promotion programs</li> </ul>
<b>Mental health effects on communities</b> <ul style="list-style-type: none"> <li>• Family distress</li> <li>• Withdrawal from community activities</li> <li>• Loss of community due to social displacement</li> </ul>	<ul style="list-style-type: none"> <li>• Outreach and service coordination</li> <li>• Community development projects</li> <li>• Information provision</li> <li>• Community engagement work with incoming groups</li> </ul>

\* Sources used include Department of Human Services (2009); Norris et al (2008)

As climate change begins to transform the economy some segments of the community and some localities will experience more distress than others. The combination of material support, enhancement of individual and community resilience provided by networks of appropriate agencies is appropriate.

## Storyline 5. A mitigation storyline - Greening health services

Chain of effects	Potential responses*
Unsustainable institutional practices increase greenhouse gases that create global warming (climate change)	
<b>International, national and state level policies to:</b> <ul style="list-style-type: none"> <li>• Reduce greenhouse gas production and increase the cost of energy</li> <li>• Enhance environmental sustainability more broadly</li> </ul>	<ul style="list-style-type: none"> <li>• Increase the cost of energy</li> <li>• Provide incentives to reduce energy use in buildings and transport</li> <li>• Incentives for green purchasing</li> <li>• Programs to improve waste management</li> </ul>
<b>Agency policies to:</b> <ul style="list-style-type: none"> <li>• Reduce the use of energy</li> <li>• Enhance environmental sustainability more broadly</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental audit of buildings &amp; retrofit as required</li> <li>• Adopt energy and water efficiency programs that change staff behaviour</li> <li>• Implement green purchasing policies</li> <li>• Encourage low energy and active transport options</li> </ul>
<b>Support for households to:</b> <ul style="list-style-type: none"> <li>• Reduce the use of energy</li> <li>• Enhance environmental sustainability more broadly</li> </ul>	<ul style="list-style-type: none"> <li>• Facilitate household access to energy and water conservation programs</li> <li>• Health promotion programs with households on efficient use of energy and water</li> <li>• Programs to facilitate access to affordable food</li> </ul>

\* Sources used include Coote (2006); Blashki, Butler & Brown (2006); Rowe and Thomas (2008)

This storyline uses a multi-layered institutional perspective to illustrate cascading effects of government policy and a role for primary care agencies in implementing and promoting adaptation and mitigation strategies internally and in their communities.

### 6. Strategies for action

As the storylines have illustrated a primary health care response to climate change requires very little in terms of new kinds of interventions. Rather it is a question of applying familiar interventions to a new problem.

The 'newness' of climate change in primary health care is in two areas. The first area is not so much in understanding what climate change is but in fully grasping the impacts it is having on people and communities now, and the effects that will become more conspicuous as the existing levels of greenhouse gases shift climate patterns. The responses in this area are the 'downstream' responses of adaptation and coping. The second area of 'newness' is in understanding the structural and individual changes that are necessary to reduce the production of greenhouse gases that are necessary to minimise climate change and avoid some of the most destructive impacts. This is mitigation, an 'upstream' response from primary health care. A toolkit of primary health care responses to these two areas of 'newness' is already available.

Services for individuals experiencing the effects of emergencies such as bushfires, storms and floods and changed weather conditions such as heatwaves will often require service coordination as well as provision of specific services. In the health promotion area this may take the form of self-help initiatives such as chronic disease self-management and recovery programs based on the principles of resilience.

Communities experiencing the effects of changed climate conditions such as drought, and those experiencing the changed social and economic environment that follow, are likely to require agencies to form inter-sectoral partnerships to marshal resources. This is an important aspect of community resilience. Integrated health promotion work can adopt the community resilience framework to enhance resilient structures, relationships and responses to challenges in communities.

Having made these observations it needs to be said that responding to climate change in primary health care has to be a work in progress. There is a lot that we can do today, but undoubtedly there will be a lot more in the future.

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