

# Climate change and primary health care intervention framework

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**Abstract.** Climate change has been described as the issue of our times. The World Health Organization argues that it will result in both beneficial and harmful effects for human populations and that the harms are likely to outweigh the benefits. Climate scientists can sketch an outline of the probable changes by country, and even region within a country. The effect of climate change on communities is much harder to predict. However, it can be argued with some confidence that the effects will be unequally distributed across communities and that the ways in which communities respond will make a substantial difference to their wellbeing. This paper uses the predictions for climate change in Victoria, Australia, as the background to a discussion of primary health care principles and how they might translate into coping, adaptation and mitigation activities within the primary health care sector. The major primary health care agencies are linked to one another through Primary Care Partnership structures and processes, which provide a foundation for sector-wide responses to climate change. The concept of a storyline, a brief scenario capturing the logic of changes and potential responses, is used to link evidence of climate change effects on communities and individuals to potential responses by primary health care agencies.

## 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 responding to climate change 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 how they should go about their business (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.

Because core institutional knowledge, practices, values and rules are usually taken for granted (this is a feature of all

institutions) and not regularly discussed none of these elements of institutional change will be glaringly obvious to most people working within primary health care. Hence, our capacity to cope with, and adapt to, climate change will develop incrementally.

In this paper a framework that can support decisions about primary health care agencies' responses to climate change is articulated. It is based on the core principles of primary health care and published literature relevant to those principles. It was developed with agencies from the South East Healthy Communities Partnership that covers the City of Greater Dandenong, City of Casey and Cardinia Shire in Victoria.

## Primary health care

The modern concept of primary health care is articulated in the Declaration of Alma Ata, a statement jointly sponsored by the World Health Organization and the United Nations Children's Fund, and used globally by governments, organisations and health workers to define primary health care (World Health Organization and United Nations Children's Fund 1978). It remains a core document in primary health care (Department of Human Services 2009b). The Department of Human Services (2009b) adapted the Declaration of Alma Ata definition of primary health care to the contemporary Victorian context to read:

*Primary health care is integral to the Victorian health system. Community-based, it seeks to protect, promote*

*and develop the health of defined communities; and by addressing and managing individual and population health problems at an early stage reduces the need for more complex care. At the other end of the health care continuum, primary health care services can support rehabilitation and care at home.*

*Primary health care in Victoria should be provided by a range of suitably trained health practitioners, working collaboratively and in partnership with other sectors, to provide timely, appropriate, integrated and person-centred services and population health actions.*

*Primary health care services give priority to those most in need and address health inequalities; maximise community and individual self-reliance, participation and control, and use appropriate technologies. Primary health care in Victoria is underpinned by an understanding of the social, economic, cultural and political determinants of health (Department of Human Services 2009b, p. 16).*

In Victoria primary health care services include types of services such as community health, district nursing, general practice and primary care services delivered by local government and in some cases hospitals; community based services for particular populations such as older people, women, Indigenous people, immigrants; and the provision of particular services in a community setting such as psychiatric support and community drug treatment services. In Victoria primary health care services are linked to each other through structures called Primary Care Partnerships (PCP). PCP are a core part of the Victorian primary care and broader human services sector and seek to improve integrated care and health promotion. PCP have enabled coordination of planning and care pathways for many population groups at risk of poor health, such as refugee and Indigenous groups, people facing difficulty due to severe drought, and people with chronic and complex conditions. Information about PCP can be found at <http://www.health.vic.gov.au/pcps/> (verified 28 September 2009). The range of capacity within agencies participating in PCP mean that they have the capacity to undertake diverse, and synergistic, interventions to address complex problems such as climate change.

Primary health care has a remit to address the forces that have a demonstrable impact on the health of community members whether they be biological, social, economic, cultural or political; to do this within the context of a service and community system mobilising the resources within their own agency, in other primary health care agencies or in other relevant service sectors; and to operationalise the core values of social justice, community participation and solidarity (World Health Organization 2008b). This remit for primary health care shapes its engagement with the problem of climate change.

## Overview of environmental change and responses to it

Two key points need to be made at the beginning of this section. First, there is substantial literature in several 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 (Pachauri and Reisinger 2007, p. 37; Garnaut 2008). Both natural and human induced global warming create environmental effects to which we must adapt. It is expected that the harmful effects of global warming on health will outweigh the beneficial effects that might be expected for some parts of the world (World Health Organization 2008a). Where human activity contributes to global warming we must change the activities (mitigation) that contribute to the changes in climate.

Overall the direct consequences of climate change in Victoria will be: rising temperatures, more heat waves and bushfires; less rainfall and drier environments; sea level rises and coastal flooding (Gardiner 2008, p. 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.

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, the greening of industry, each of which changes the social environment in which people live (Chapman and Boston 2007).

Responses to the problem of climate change are typically classified into the categories of adaptation and mitigation. However, in primary health care it is useful to break the classification system down further 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, p. 19).*

Coping strategies are the ways people invent to maintain their wellbeing and 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, p. 19).

Adaptive strategies are changes to 'ways of doing business', to priorities and to organisations 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, p. 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 organisations everywhere to reduce their production of greenhouse gases.

There are a small number of historical and archaeological 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). In a similar vein Fagan (2009) traces the relationships between archaeological evidence remaining from human societies and the science of climate fluctuations. In Fagan's view the evidence is clear that climate change poses challenges for communities to which they must effectively adapt. The societal impacts of climate change 'will be determined in part by the degree to which any given national economy is dependent on climate-sensitive natural resources, and the robustness and resilience of social institutions to manage change' across space, time and on multiple scales (Barnett and Adger 2007, p. 642). In a detailed study of climate, society and economy in modern Greenland, Hamilton *et al.* (2000, p. 210) conclude that 'Geographical advantages, human resources and government decisions can influence how different people and places fare when their environmental regime shifts'. How a community and society respond to the effects of climate change is an important variable influencing their future.

Primary health care can be considered an institution with a capacity and mandate to work with communities on coping and adaptation strategies at the local level (small scale), and implementing large-scale mitigation strategies in those communities. Drought in Australia provides an example of

how primary health care agencies can modify their services to respond more appropriately to climate change.

Drought of increased intensity and frequency is one of the predicted effects of climate change in Victoria and Australia as a whole (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, p. 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 focussed 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, p. 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.

### 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 public health

literature there are 10 major categories of risk for health resulting from climate change (Horton *et al.* 2008). The relative importance of the 10 categories of risk varies between localities, for example, some are more relevant in areas where temperatures are higher or forests have higher fuel loads, but all are relevant to some extent in Victoria. In primary health care each of these will require a response of some kind. The response of agencies will depend on the particular risks they confront and their capacity and mandate for action (Table 1).

Health impacts will vary across 'regions, communities and demographic subgroups' reflecting (Garnaut 2008, p. 139):

- Differences in location (geographic)
- Socioeconomic status
- Preparedness
- Infrastructure
- Institutional resources
- Local adaptive strategies.

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.

**Table 1. Health risks from climate change**

Main categories of risks to health <sup>A</sup>	Elaboration on the risks <sup>B</sup>
Health impacts of extreme weather events (e.g. floods, storms, cyclones, bushfires)	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. 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 (e.g. from <i>Salmonella</i> , <i>Campylobacter</i> 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 <i>Salmonella</i> 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 (e.g. 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 (e.g. spores, pollens), thereby exacerbating asthma and other allergic diseases	Increased temperature and CO <sub>2</sub> enhances the growth of some allergen-producing plants and fungi.
Mental health consequences of social, economic and demographic dislocations (e.g. in parts of rural Australia and, via disruptions to traditional ways of living, in remote Indigenous communities)	Economic adaptation will have social and mental health effects. This is currently apparent in drought-affected areas but may also appear in other locations where economic adaptation is concentrated. It may lead to population movements creating other social and economic problems including conflict.
Emotional stresses and mental health problems in children in response to perceptions/fears of climate change and to family stresses (e.g. impaired rural livelihoods)	The most dramatic effects are on children experiencing natural disasters who frequently manifest post traumatic stress and this is greater in younger children and those with greater exposure to threat. <sup>C</sup> After the Canberra bushfires research showed that proximity to the fire and perceived threat to child and family had most effect on stress and emotional well being of children. <sup>D</sup>

<sup>A</sup>Source: Horton *et al.* (2008). <sup>B</sup>Sources: Department of Human Services (2007); Russell *et al.* (2009). <sup>C</sup>Source: Akachi *et al.* (2009). <sup>D</sup>Source: McDermott *et al.* (2005).



## Implementing the core values of primary health care

The core values in primary health care are relevant in whatever action is taken in regard to climate change.

### *Social justice*

Garnaut (2008, p. 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, p. 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 of reduced mobility, for example, social isolation. Low-income people in rental accommodation will also be vulnerable to the consequences of landlord resistance to retrofitting rental properties (Garnaut 2008, p. 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 (Akachi *et al.* 2009) argues that children constitute a population group that is very 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 climate change related 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 (e.g. Drought Policy Review Expert Social Panel 2008, p. 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.

### *Participation and solidarity: 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 of individuals 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 and Fisher 1998, p. 458).

Landau (2007) is concerned with 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, p. 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 and 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 before the stressful events occur (Landau and Weaver 2006, p. 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 a strength of the primary health care sector in Victoria 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, p. 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.

Table 2 lists 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 2. Adaptive capacities that need to be linked to create community resilience**Adapted from Norris *et al.* 2008, p. 136

Major adaptive capacities	Components of the adaptive capacities
Economic development	Fairness of risk and vulnerability to hazard Level and diversity of economic resources Equity of resource distribution
Social capital	Received social support Expected social support Informal community ties Organisational linkages and cooperation Citizen participation – leadership and roles (formal community ties) Sense of community Attachment to place
Community competence	Community organisation and action Critical reflection and problem solving skills Flexibility and creativity Collective empowerment Political partnerships
Information and communication	Story telling about the community Responsible media Communication skills and infrastructure Trusted sources of information

Efforts to enhance community resilience 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, p. 19).

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

- (1) 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.
- (2) 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.
- (3) Creating and evaluating long-term support programs. Ultimately outside professionals withdraw.

### 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, p. 7). These are high levels of awareness. Awareness is the first, and essential, step towards behaviour change.

In the Victorian Greenlight study 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, p. 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). The Australian Bureau of Statistics (2009) has published a comprehensive national study of community concerns and perceptions of environmental issues including climate change that shows a similar pattern.

### 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 to consider the implications for primary health care agencies. The primary health care sector includes agencies with diverse mandates and capacities. Partnerships between primary health care agencies are the vehicle for creating synergy in their responses to climate change. In the storylines below the potential responses are relevant to the sector but not all of them to all 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 and Semenza 2008).

One of the economic tools likely to be used to reduce energy use is an increase in its price. There will be health consequences of using this policy tool (Storyline 1).

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 (Storyline 2).

Coping responses are short-term responses to risks, tend to occur at the individual, household or small community scale,

#### Storyline 1. An adaptation story line – rising cost of carbon

Source: Garnaut (2008)

Chain of effects	Potential responses
A carbon trading scheme raises the cost of electricity, transport and food	
Greatest impact is on the poorest people	Income support and help with household adaptation
Less money for food, transport, heating, cooling and adaptation	Health promotion regarding changing diet, e.g. eating less meat, food gardens, reduced household energy use
Health effects of poverty	Services for the effects of poverty

**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		
>65 years, living in the community and isolated	Modify the environment e.g. increase shade	Adaptation
Chronic illness	Strengthen chronic disease self-management programs	Coping/adaptation
Disadvantaged people	Audit and retrofitting of low income homes	Adaptation
Effects on individuals		
Heat exhaustion	Open windows in the evening	Coping
Exacerbation of symptoms	Monitor clients in the community	Coping
	Create cool rooms in houses	Adaptation

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.

Storyline 3 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.

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 4).

Storyline 5 uses a multilayered 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.

### 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

**Storyline 3. An emergency storyline – extreme weather event: flood**

Chain of effects	Potential responses
Heavy rain and flooding of an urban area	
Vulnerable groups	
People living in low-lying areas	Assessment of those at risk and their location
People whose lines of communication have been cut	Activation of coordinated emergency response plans
Effects on individuals	
Injury	Medical/nursing services for the injured
Gastroenteritis from contaminated floodwater	Medical/nursing services for infected people
Shortage of food and water	Coordination of supplies and catering
Stress	Organisation of community peer support
Loss of property	Provision of material aid
Effects on community	
Economic disruption	Emergency relief payments
Damage to infrastructure	Repair work based on need
Social stress	Community organisation to address basic needs and opportunities for community conversation and storytelling

**Storyline 4. A mental health storyline – community stress**

Chain of effects <sup>A</sup>	Potential responses <sup>B</sup>
Economic decline of carbon intensive industry	
Vulnerable groups	
People who lose their jobs	Income support
Low skilled unemployed	Skills training and social support
Unemployed people in communities with limited adaptive capacity	Facilitation of social capital development and community competence particularly political partnerships for economic development
Mental health effects on individuals	
Reduced personal autonomy	Counselling
Negative self perception	Peer support
Stress	Social inclusion programs
Insecurity	Mental health promotion programs
Mental health effects on communities	
Family distress	Outreach and service coordination
Withdrawal from community activities	Community development projects
Loss of community due to social displacement	Information provision
	Community engagement work with incoming groups

<sup>A</sup>Source: Fritze *et al.* (2008). <sup>B</sup>Sources: Department of Human Services (2009a); Norris *et al.* (2008).

**Storyline 5. A mitigation storyline – greening health services**

Chain of effects	Potential responses <sup>A</sup>
Unsustainable institutional practices increase greenhouse gases that create global warming (climate change)	
International, national and state level policies to:	
Reduce greenhouse gas production and increase the cost of energy	Increase the cost of energy
Enhance environmental sustainability more broadly	Provide incentives to reduce energy use in buildings and transport
Agency policies to:	Incentives for green purchasing
Reduce the use of energy	Programs to improve waste management
Enhance environmental sustainability more broadly	Environmental audit of buildings and retrofit as required
Support for households to:	Adopt energy and water efficiency programs that change staff behaviour
Reduce the use of energy	Implement green purchasing policies
Enhance environmental sustainability more broadly	Encourage low energy and active transport options
	Facilitate household access to energy and water conservation programs
	Health promotion programs with households on efficient use of energy and water
	Programs to facilitate access to affordable food

<sup>A</sup>Sources: Coote (2006); Blashki *et al.* (2006); Rowe and Thomas (2008).

changed social and economic environment that follow, are likely to require agencies to form intersectoral 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.

**Conflicts of interest**

None declared.

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