Submission to the Senate Standing Committee on Environment and Communications

Inquiry into Recent trends in and preparedness for extreme weather events

Australian Medical Association

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Introduction

The increasing frequency and severity of extreme weather events has significant implications for public health in Australia. Amid a backdrop of record temperatures, unprecedented heatwaves, and bushfire destruction, the capacity of communities and services to respond to climatic extremes is under intense scrutiny. The current parliamentary inquiry into extreme weather events therefore represents a timely and important opportunity to review Australia's preparedness for such events, including the capacity to meet the health impacts of extreme heat, bushfires, flood, severe storms, and drought. As the peak professional organisation representing medical practitioners in Australia, the Australian Medical Association (AMA) welcomes the opportunity to make this submission and contribute to the ongoing discussion around an important public policy challenge.

It is beyond the scope of this submission to quantify the extent and distribution of future changes to the climate, or to comprehensively address the policy implications of weather extremes. This submission focuses instead on the specific health implications of extreme weather events, and is framed around the inquiry's terms of reference and their specific relevance in terms of health and health services. It summarises the key health risks associated with extreme weather events; assesses the state of preparedness for these risks within and outside the health sector; and recommends steps needed to improve Australia's capacity to meet the health impacts associated with extreme weather events.

Critically, this submission highlights fundamental gaps in Australia's capacity to minimise and respond to the health impacts of extreme weather events. While progress has been made on some fronts, a number of cross-cutting problems remain:

- ***Government policy is fragmented.*** Australia still lacks a nationally coordinated approach to managing the health impacts associated with extreme weather events and climate change. Information on the likely health risks associated with extreme weather events is fragmentary and dispersed, and inhibits effective adaptation at the local, regional, state and national levels. Policy fragmentation is compounded by the complexity of interjurisdictional arrangements, and inconsistencies between policies of different departments within jurisdictions.
- ***Lack of understanding of the health implications of extreme weather events.*** Despite growing awareness about the links between climate change and extreme weather events, there is a general lack of understanding of the scope and scale of implications for human health within communities, across the various tiers of government, and within the health sector itself.
- ***Information deficits.*** Information on the likely health risks associated with extreme weather events is fragmentary and dispersed, and this in turn inhibits effective adaptation at the local, regional, state and national levels. In particular, there is no consistent framework that links health databases with real-time monitoring and prospective assessment of weather, climate, and geographic data, nor are there a consistent early warning systems.
- ***Lack of sustained investment and long-term planning.*** In most jurisdictions, the focus has been on immediate response arrangements rather than preventative measures and longer-term planning (e.g. implementing structural changes that

would reduce the impact of future events, or investing in the capacity and resilience of health services in areas at high risk of extreme weather).

- ***Lack of supportive regulations, legislation, standards and codes.***
- ***Failure to sufficiently engage health professionals and health sector in the planning and preparation for extreme weather events.***

Despite the challenges posed by climate change and extreme weather events, it is imperative measures are put in place to reduce the health impacts and costs arising from future events. This submission identifies a range of options to achieve this, and draws upon the AMA's existing position statements on *Climate Change and Human Health* and *The Involvement of GPs in Disaster and Emergency Planning.* These position statements are appended to this submission.

Costs of extreme weather events and impacts on social infrastructure and health

Changes in the frequency, intensity and duration of future weather events will expose growing numbers of Australians to hazards that affect their health. Although it is difficult to precisely quantify the extent and impacts of these changes, it is predicted that Australia will experience more heat waves, extreme fire weather, severe storms, and drought across southern parts of the continent.[1,2,3] Some of the health effects accompanying these changes will be direct, such as increases in mortality and morbidity associated with heat waves. Other health impacts will be indirect, including damage to health infrastructure, depression and post-traumatic stress disorder, increasing health inequities, and an erosion of the social determinants of good health. When estimating the overall financial costs associated with extreme weather events, it is imperative that consideration is given to the significant costs arising from health impacts.

Although the health impacts associated with more prevalent and severe extreme weather events will be profound, these impacts will not be evenly distributed, and are dependent on specific geographic, demographic, health and social contexts. The growing chronic disease burden and population ageing are critical considerations, and will act to magnify the health effects of extreme weather. Current and future mitigation and adaptation strategies will also determine the extent of localised health impacts and the associated costs. Accounts of the health effects of climate-influenced disasters suggest that a lack of adequate health service planning and support is often a necessary (but not sufficient) cause of the health consequences of such events, especially for vulnerable groups.[4] This is especially so in rural and regional areas where, as was seen in the case of the 2011 Queensland floods and the 2009 Victorian bushfires, deaths and injuries are more likely in areas that are more isolated and lack ready access to emergency services support and centralised preparatory planning and risk management services.[5]

Understanding the interaction between these various factors is essential for mapping the health risks associated with weather extremes, and is a prerequisite for effective planning and preparation and the strategic allocation of resources. Despite the pressing need for such analysis, limited work has been undertaken at a local or regional level to systematically map the health risks and projected costs associated with extreme weather. Planning and preparation for these impacts is hampered by a lack of localised information that combines projected weather changes with relevant health and demographic data.

Although the magnitude and distribution of health impacts – and their resulting costs – is yet to be comprehensively determined, a number of studies have documented the likely health implications of extreme weather trends and projections in Australia, as summarised below.

Extreme heat and bushfires

Modelling of future climate change predicts that Australians will face extreme hot weather far more often, with the number of days with temperatures over 35°C predicted to double by 2030 for major cities in southern Australia.[1,2,3] As well as becoming more frequent, heatwaves are likely to increase in intensity and duration,

thereby compounding the adverse consequences of such events.

The health implications of these projections are profound. Heatwaves have a greater impact on population health in Australia than any other natural hazard, and are associated with significant increase in mortality and morbidity rates.[6] Figure 1 depicts the estimated increase in mortality associated with extreme heat events, and compares rates for 2011, 2030 and 2050.* As this figure reveals, deaths associated with extreme heat are predicted to more than double if Australia does not improve the way these events are handled.[7]

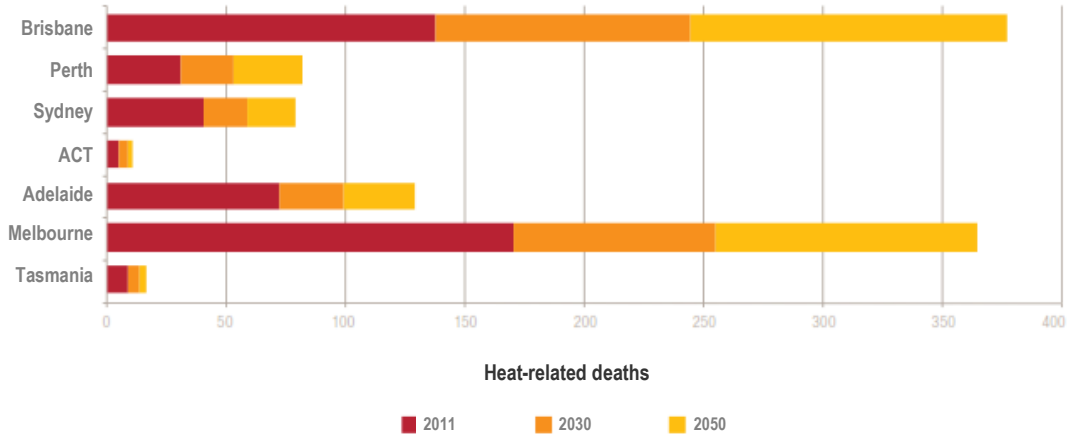

Figure 1. Estimates of extreme heat-related deaths for 2011, 2030 and 2050

(adapted from 2011 PricewaterhouseCoopers Report, 'Protecting human health and safety during severe and extreme heat events'[8])

Extreme heat events have been linked to increased GP visitations, ambulance callouts, presentations to emergency departments, and hospital admissions for conditions relating to heat stress and dehydration, or as a result of heat exacerbating pre-existing conditions.[9] The risk of heat-related mortality and morbidity is increased for people with pre-existing illnesses, including cardiovascular disease; psychiatric, neurological and cognitive impairment; diabetes, cancer and obesity.[10] Some medications used to increase these conditions may also increase vulnerability to heat-related health effects by compromising thermoregulation, thermal awareness, mobility, or the ability to adopt protective behaviours. An additional area of concern is occupational heat stroke, particularly for outdoor workers and indoor workers with minimal access to cooling systems while working.[11]

* Based on modelling that incorporates relevant climate data, health data, and population data and projections.

Bushfires

A particular risk in hot weather in Australia is bush fires and related health risks from smoke and burns. In addition to large scale loss of life and injury, the effects of increased air pollution can impact on respiratory disease among populations that are not directly affected by fire. Bushfire can damage local infrastructure, lead to the contamination of water supplies, and disrupt the delivery of health services. Long-term health consequences include post-traumatic stress, depression and anxiety.[12]

Wind, storms and floods

The health costs arising from extreme wind, storm and flood events are significant, and can stem from short-term (e.g. drowning and physical trauma), medium-term (e.g. spread of infectious and vectorborne diseases), or long-term (e.g. post-traumatic stress and depression).[12] Such events cause significant damage to infrastructure, thereby hindering the delivery of health services both during and after of such events. Damage to water supplies and sewerage treatment facilities can contribute to contaminated water and facilitate the spread of infectious disease.

Drought

Drought can indirectly contribute to health risks by reducing the supply and quality of water and food, increasing the probability of bushfires, and creating an environment conducive to the spread of vectorborne diseases.[12] The potential mental health effects of drought are significant, particularly among rural communities. Prolonged drought may also affect the cost and availability of food, leading to dietary changes and intensifying cost of living pressures for people on low incomes.

Vulnerable populations

There is a growing recognition that the distribution of weather-related health impacts has been, and will continue to be, uneven, falling more heavily on low-income populations and those with chronic health conditions. Other factors associated with increased vulnerability include age, disability, homelessness, social isolation, poor English language skills, and residing in rural and remote communities. Vulnerability to health impacts is considered to be particularly elevated for Indigenous people living in remote communities.

Identifying populations or regions where vulnerability is particularly high can help to quantify the potential costs associated with extreme weather, and to clarify where efforts to increase the adaptive capacity should be focused. Such analysis, however, is limited in Australia, particularly at a localised level. Despite acceptance that the health impacts and costs arising from extreme weather events will be unevenly distributed, limited research has been undertaken to more precisely estimate these differential impacts, nor has systematic modelling been undertaken to furnish local governments with the data and information they require to identify areas of heightened vulnerability.[13,14] It is imperative such knowledge and information gaps are addressed if we are to better understand the potential health-related costs arising from future weather events, and to develop strategies to minimise these costs.

Recommendation: A systematic analysis of the health costs associated with increased weather events is yet to be undertaken in Australia, and it is imperative that there is a better understanding of the full extent of potential health impacts. Quantitative modelling of the health impacts and costs associated with extreme weather events should be undertaken, including identification of highly vulnerable groups and regions. In conjunction with this, local governments should be equipped with the support tools and relevant data and information required to undertake local health impact assessments and vulnerability mapping.

Recommendation: Future estimates of the economic impact of extreme weather events should incorporate costs associated with the widespread health effects of such events.

Preparedness of key sectors for extreme weather events

Australia is ill-prepared to deal with the health impacts of increasingly frequent and intense extreme weather events. This preparedness gap includes not just infrastructure and capacity, but also limitations in knowledge and awareness, in the availability of reliable decision support tools, and in mechanisms for coordinating the efforts of different sectors and various tiers of government. The health impacts of extreme weather will intensify the demand and strain on health services, and amplify existing disorders and health inequities. Critically, however, mitigation and preparatory activities for these health impacts need to take place within both the health and non-health sectors. Extreme heat events, for example, can place strain on electricity supply networks, resulting in outages that not only limit access to air-conditioned environments and increase the incidence of heat stress, but also interfere with the operation of health services.

Addressing information and knowledge deficits

A sound understanding of the health impacts and implications of extreme weather is vital to mobilise action and ensure communities, services, and local governments are adequately prepared. There is, however, limited understanding – both within and outside the health sector – about the risks to health from extreme weather and climate change. As the preceding discussion has indicated, information on the likely health costs associated with extreme weather events is fragmentary and dispersed, and this inhibits effective adaptation and planning across a range of sectors and settings. At present, there is no consistent framework that links health datasets with real-time monitoring and prospective assessments of weather, climate and geographic data. This not only prevents health services from receiving timely information, but also limits the capacity of other sectors to factor relevant health considerations into planning and preparation.

To motivate appropriate responses across all sectors of society, further research is required to identify how to communicate most effectively the health risks associated with extreme weather, and the possible health benefits of mitigation and adaptation options to address these risks.

Recommendation: It is imperative greater efforts are made to communicate to the public, and to policy makers, the health threats posed by extreme weather events.

Recommendation: To inform future communication strategies that raise awareness of weather-related health impacts, a comprehensive evaluation should be undertaken of existing risk communications, and research should be undertaken to identify effective messaging, modes of delivery, and specific communication strategies targeting vulnerable populations.

Developing standardised and effective early warning systems

Evidence demonstrates that early warning systems can reduce the morbidity and mortality associated with extreme weather events.[15] Accurate and timely alert systems are therefore critical for managing and minimising the health impacts associated with extreme weather events. To be effective, early warning systems need to be communicated in a timely and relevant manner to services, and should form an integral part of the operational decision-making process in the health sector. For example, emergency departments in hospitals need to be alerted in time to manage an increase in admissions associated with heat waves or other extreme weather events. Community and service providers also need to be equipped to take the appropriate course of action and preventative measures if warnings are issued.

Despite the demonstrated importance of early warning systems, there are significant gaps and inconsistencies in early warning systems across Australia. Effective early warning systems should initiate a range of interventions in response to a warning. However, of those warning systems that are currently in place in Australia, few have been evaluated for their effectiveness. In addition, greater efforts need to be made to include input from the health sector and health professionals to ensure early warning systems incorporate relevant information and are communicated appropriately. This may include, for example, understanding the temperature thresholds for issuing warnings associated with extreme heat, and identifying preventative health and protective actions that need to be initiated when such alerts are issued.

Recommendation: Early warning systems need to be maintained and strengthened to improve the capacity of services and communities to respond to extreme weather events.

Improving the preparedness of the health sector

Extreme weather events pose numerous challenges to health services, and it is imperative a more sustained and coordinated response is developed to better equip the health sector for future events. Simultaneous or successive weather events have the potential to place an enormous strain on health resources, yet, in general, the health sector is ill-prepared for the potential demands that may arise from such events.

One of the fundamental issues that has undermined preparedness across the health sector is a gap in policy leadership at the federal level and from the federal health bureaucracy. In 2007, COAG identified the need for a national strategy specifically designed to drive and coordinate actions to reduce the health impacts of climate change and climate-related events. Despite the recognised need for this coordinated and strategic response, policies to support the preparedness of the health sector are yet to be put in place, and the existing *National Environmental Health Strategy* does not fulfil this purpose. The AMA believe that a National Strategy for Health and Climate Change should be urgently developed. This strategy should in turn underpin

future efforts to improve the capacity of the health sector to respond to the challenges posed by extreme weather events.

In addition to policy leadership, there are a range of factors that can compromise the preparedness of the health sector, including:

- lack of long-term planning to improve the resilience of services;
- limited understanding of the risks to health from extreme weather events;
- lack of relevant and accessible information on trends and likely impacts to inform future planning and strategic allocation of resources;
- insufficient surge capacity for responses to extreme weather events and increased health care demand;
- lack of accurate and timely alert systems; and,
- failure to adequately engage the health sector and health professionals in mitigation/adaptation strategies and local disaster management plans.

Extreme weather events have the potential to amplify the effects of chronic disease and, in the context of population ageing and the increased incidence of extreme weather, health service planning needs to incorporate the potential healthcare demands that may arise.[16] Despite the synergistic effects of increasing chronic disease and more extreme weather, limited attention has been given to integrating climate and weather-related factors into the current health policy and planning.

An increase in the frequency and intensity of extreme weather has the potential to magnify health inequities, and exacerbate the strain on health services in rural and remote regions.[17] Greater efforts are required to boost the capacity and resilience of health services in areas with a heightened vulnerability, including rural and remote areas, and in remote Indigenous communities.

Preparing the health sector for future extreme weather events requires a thorough understanding of the potential health risks, areas likely to experience pronounced increases in service demand, the possible impacts on infrastructure, and what constitutes effective strategies to protect health in the context of such events. Health professionals are ideally placed to identify the ways in which extreme weather events may impact on people's health, and to communicate this to the public and to policy makers. Within the health sector, however, knowledge and awareness around the health impacts of climate change and extreme weather events is variable. Increasing awareness among health professionals could assist in developing more effective responses, as well as facilitate communication with the public about the risk to health and preventative or health protection strategies. Moreover, greater awareness among public health bureaucrats and policy makers is imperative if relevant considerations are to be factored into policy and planning processes.

Recommendation: A National Strategy for Health and Climate Change should be developed and implemented to ensure Australia can respond effectively to the health impacts of climate change and extreme weather events, and to improve the preparedness of the health sector.

Recommendation: A communication strategy for the health sector should be developed and implemented to raise the level of knowledge and awareness of climate- and weather-related health risks. Increasing awareness among health professionals is necessary to develop more effective adaptive responses, and to

support better communication with the public about risks to health and effective strategies for health protection. Funding should be made available for the development and delivery of quality professional development for health and other community services personnel on the health impacts of climate change and extreme weather events.

Recommendation: Improve existing public health surveillance systems to ensure they are sufficiently comprehensive and sensitive to monitor the effects of climate change and extreme weather on health morbidity and mortality.

Recommendation: When designing and implementing health impact assessments and vulnerability mapping associated with extreme weather, ensure input is sought from health professionals and the health sector. Ensure the outcomes of these assessments and mapping are incorporated into future planning and preparedness strategies for health services.

Improving coordination and intersectoral linkages

Recommendation: Strong and active communication linkages between hospitals, major medical centres and local weather forecasters and emergency response agencies should be maintained to maximise timely response and efficient use of health resource in extreme weather events.

Preparedness and adequacy of resources in the emergency services to prevent and respond to extreme weather events

Given the projected increases in extreme weather events, and the increased likelihood of simultaneous or successive events, greater attention needs to be given to the preparedness and adequacy of emergency services and the resultant pressures in emergency and high acuity health services. Ensuring emergency services are appropriately coordinated with health professionals, medical centres, clinics, hospitals and other health care facilities is critical to manage increased demand and the infrastructure disruptions that may accompany major emergencies.

The AMA's position statement *Involvement of GPs in Disaster and Emergency Planning* outlines key considerations that should inform emergency planning, and is appended to this submission. As this statement indicates, planning for GP involvement at the time of disasters has been ad hoc and variable across jurisdictions, and improved coordination and communication mechanisms are required to better utilise primary care practitioners during extreme weather events.

Recommendation: The input of medical practitioners, including GPs, should be incorporated in emergency response planning, and as part of response teams, across all jurisdictional layers.

Recommendation: Emergency services and local emergency response plans should maintain databases to record primary care practitioners who have the appropriate training and are willing to participate in medical response teams, or to assist in delivering medical services during extreme weather events.

Recommendation: Coordinated planning and policy procedures need to be established in high-risk regions to manage climate-related contingencies and 'surge capacity' demands. This includes improved communication mechanisms between emergency services and primary health care providers; strategies to upscale emergency and high acuity health services as needed; and ensuring essential infrastructure, hospitals and other services are designed to withstand threats to energy supply (e.g. during heatwaves) and direct climatic impacts (e.g. coastal inundation).

National coordination of climate change response and risk management

Despite the profound health risks posed by climate change and extreme weather events, the response to these risks has been characterised by a lack of national coordination and policy leadership. In 2007, COAG committed to developing a national strategy specific to health as part of the *National Climate Change Adaptation Framework*. This Framework, however, is yet to be developed.

Planning for the impacts of climate change and extreme weather requires efforts beyond any single agency or portfolio, and greater efforts are required to achieve a whole-of-government approach and better coordination across agencies and portfolios, and across different tiers of government. For example, the last risk assessment by the Commonwealth Department of Health an Ageing was undertaken in 2002, and the department is yet to develop resources on health adaptation or mitigation strategies in response to extreme weather events or climate change, either for health professionals or for the public.

Political will to address the health risks of extreme weather events is essential. This includes developing strategic policy frameworks, implementing adaptation plans, and ensuring effective monitoring and management. It is also necessary to build coalitions between relevant sectors and partners, and to encourage public understanding and support. Greater national consistency is also required in key elements underpinning planning and response arrangements. This includes developing consist methodologies for forecasting heat events and triggering public health warnings. At present, there is no nationally agreed definition of what constitutes a heat wave or heat event.

Recommendation: A national heat event strategy should be developed and maintained, complimenting the* National Strategy for Disaster Resilience, *and with appropriate consideration given to the significant health implications and health service demands associated with extreme heat.

Gaps in Australia's Climate Change Adaptation Framework

To improve policy coordination and leadership, there is a need to refresh the National Climate Change Adaptation Framework. Aside from research efforts, there has been little visible progress on this framework, which was agreed by COAG in 2007.

As it is currently articulated, the national framework perpetuates the silo mentality that demarcates policy into discrete areas, and provided little impetus for the whole-of-government response needed to respond to climate change. Health is not integrated across the strategy, but is instead sequestered in a discrete section of the

document. It is critical a refreshed national framework supports improved communication and joint planning between portfolios, including health and ageing, environment, and infrastructure. Greater consideration is also needed to link the framework into other relevant national strategies and actions plans, and to articulate the respective roles and responsibilities of different tiers of government.

As indicated above, a critical shortcoming in the current Adaptation Framework is the failure to develop a National Strategy for Health and Climate Change. The AMA recommends that this strategy be developed to complement the National Adaptation Framework, and to ensure Australia can better respond to the future health impacts of climate change and extreme weather events.

REFERENCES

[1] Intergovernmental Panel on Climate Change [IPCC], (2012). *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. A Special Report of Working Groups I and II of the IPCC. Cambridge University Press: Cambridge and New York.

[2] Garnaut, R, (2008). *The Garnaut Climate Change Review: Final Report.* Commonwealth of Australia: Canberra.

[3] CSIRO, (2010). *State of the Climate*. CSIRO: Canberra. http://www.csiro.au/files/files/pvfo.pdf [viewed 20 January 2013].

[4] Bell, E, (2011). Making health services 'climate ready': a policy framework for regional development. *American Journal of Public Health*. 101(5):804-813.

[5] Teague, B, McLeod, R, Pascoe, S, (2009). *2009 Victorian Bushfires Royal Commission Interim Report.* Parliament of Victoria: Melbourne.

[6] Loughnan, M, Tapper, N, Phan, T, Lynch, K, McInnes, J, (2013). *A spatial vulnerability analysis of urban populations during extreme heat events in Australian capital cities*. National Climate Change Adaptation Research Facility: Gold Coast. http://apo.org.au/sites/default/files/Loughnan-ExtremeHeatEventsinAustralianCapitalCities-WebRes_0.pdf [viewed 17 January 2013].

[7] PricewaterhouseCoopers (PWC), (2011). *Protecting human health and safety during severe and extreme heat events: a national framework*. Report prepared by PWC in collaboration with the Australian Government (through the Department of Climate Change and Energy and Efficiency): Canberra. http://www.pwc.com/en_UK/gx/psrc/pdf/heatwaves-tl-pwc-november.pdf [viewed 18 January 2013].

[8] PricewaterhouseCoopers (PWC), (2011). *Protecting human health and safety during severe and extreme heat events: a national framework*. Report prepared by PWC in collaboration with the Australian Government (through the Department of Climate Change and Energy and Efficiency): Canberra. http://www.pwc.com/en_UK/gx/psrc/pdf/heatwaves-tl-pwc-november.pdf [viewed 18 January 2013].

[9] Bi, P, Williams, S, Loughnan, M, Lloyd, G, Hansen, A, Kjellstrom, T, Dear, K, Saniotis, A, (2011). The effects of extreme heat on human mortality and morbidity in Australia: implications for public health. *Asian and Pacific Journal of Public Health*, 23(supplement): s27-s36.

[10] Reeves J, Foelz C, Grace P, et al., (2010). *Impacts and adaptation responses of infrastructure and communities to heatwaves: the southern Australian experience of 2009*. National Climate Change Adaptation Research Facility: Gold Coast. http://www.isr.qut.edu.au/downloads/heatwave_case_study_2010_isr.pdf [viewed 16 January 2013].

[11] Hanna, E, Kjellstrom, T, Bennett, C, & Dear, K, (2011). Climate Change and Rising Heat: Population Health Implications for Working People in Australia. *Asia Pacific Journal of Public Health* 23(supplement):14S-26S.

[12] Australian Institute of Health and Welfare (AIHW), (2011). *Health and the environment: a compilation of the evidence.* Cat. No. PHE 136. AIHW: Canberra.

[13] Green, D, Niall, S, & Morrison, J, (2012). Bridging the gap between theory and practice in climate change vulnerability assessments for remote Indigenous communities in Northern Australia. *Local Environment: The International Journal of Justice and Sustainability* 17(3):295-315.

[14] Saniotis, A, Bi, P, (2009). Global warming and Australian public health: reasons to be concerned. *Australin Health Review* 33(4):611-617.

[15] Ebi, K, Schmier, J, (2005). A stitch in time: improving public health early warning systems for extreme weather events. *Epidemiologic Reviews* 27:115-121.

[16] Harvison, T, Newman, R, & Judd, B, (2011). *Ageing, the Built Environment and Adaptation to Climate Change*. ACCARNSI Discussion Paper, Node 3. University of New South Wales: Sydney.

[17] Green, D, Jackson, S, Morrison, J, (2009).*Risks from Climate Change to Indigenous Communities in the Tropical North of Australia.* Department of Climate Change and Energy Efficiency: Canberra.

AMA

AMA Position Statement

AMA Position Statement on Climate Change and Human Health 2004. Revised 2008

The world's climate – our life-support system – is being altered in ways that are likely to pose significant direct and indirect challenges to health. While 'climate change' can be due to natural forces or human activity, there is now substantial evidence to indicate that human activity – and specifically increased greenhouse gas (GHGs) emissions – is a key factor in the pace and extent of global temperature increases.[1] There is also evidence that GHG emissions are rising more rapidly than worst-case scenarios had predicted[2] and that the climate may be more sensitive to GHG emissions than previously thought.[3]

Global climate change

Scientific data indicate that the Earth is heating up faster than at any time in recorded history, and concentrations of CO_2 are said to be higher than at any time over at least the last 650 000 – 720 000 years.[4] Between 1970 and 2004, GHG emissions increased by 70%, with CO_2 emissions growing by about 80%. Based on current climate change mitigation policies and related sustainable development practices, global GHG emissions are predicted to continue to grow over the next few decades.[5]

Global surface temperature is estimated to have increased by between 0.6°C and 0.66°C during the 20th century, and global temperatures are estimated to have risen by an average of about 0.17°C per decade since 1976.[6] The 1990s were the warmest decade since records have been kept.[7] There is an emerging consensus among scientists that a 2°C increase in global temperatures above pre-industrial levels is likely to give rise to "dangerous, irreversible and potentially catastrophic global impacts",[8] and concerns have been raised about much greater temperature increases by the end of the century.[9] Significant warming of the oceans and accelerated melting of polar ice have already been recorded.[10]

Climate change in Australia

In Australia, average temperatures are estimated to have increased by between 0.7°C and 0.86°C since 1910,[11], and by 0.9°C since 1950.[12] Observed warming has accelerated over recent decades, with the late 20th century warming now considered to be largely attributable to GHG emissions.[13] Substantial warming has occurred in the three oceans surrounding Australia, and sea levels have risen.[14]

There is uncertainty about precisely how the climate will continue to change throughout Australia, as this depends on a range of factors. However, predictions suggest that, relative to 1990 temperatures, annual average temperatures are likely to increase significantly (0.4°C - 2.0°C) by 2030, with further increases by 2070.[15] Regional variations will also occur. For example, Western Australia is predicted to experience higher temperatures during the period 1990 - 2030, especially in inland regions; less rainfall, particularly in southwestern areas; more frequent and intense droughts, heatwaves and fires; more intense storms, floods, rainfall events and tropical cyclones; and increases in sea level in coastal regions.[16] There are indications that, by 2030, Australia will have fewer frosts and more summer days warmer than 35°C.[17] A number of Australia's ecosystems are particularly vulnerable to significant adverse consequences from even relatively small shifts in climate conditions.[18]

Climate change is expected to have direct and indirect impacts on Australia's rural communities, as changes in temperatures and rainfall patterns, and increased frequency and

severity of extreme events, influence crop and pastoral production.[19] There are indications that north-west Australia has become wetter since the 1950s, with most of eastern and south-western Australia experiencing drier conditions.[20] Projections suggest that there will be up to 20 % months with drought conditions over most of Australia by 2030, increasing to 40 % by 2070.[21] Reduced precipitation and increased evaporation are expected to result in worsening water security problems in southern and eastern Australia. This will cause significant reductions in water available for irrigation in South Australia, New South Wales and Victoria. Within 20 years, farms and towns along the Murray and lower Darling Rivers will be expected to have to live with 41% less water.[22] The number of days with very high and extreme fire danger is projected to increase, with a lengthening in the fire season. [23]

Climate change has been associated with increases in the rate of extreme weather events. In Australia, there has been an increase in extreme events, particularly severe storms and floods.[24] Many of these effects can give rise to a number of other effects, such as harmful algal blooms triggered by major coastal storms and sanitation issues associated with flooding. In addition to the more immediate impacts of higher-intensity storms and more flooding, there are predictions of longer-term effects such as rises in sea level, increases in sea surface temperature, coastal erosion and contamination of estuaries.[25] With 85 % of the Australian population living near the coastline, these changes may have major consequences. For example, the combined effect of rising sea level and stronger tropical cyclones could result in coastal flooding over large areas in the tropics.[26]

Potential health impacts of climate change

The health impacts of climate change are likely to vary from place to place and over time. Uncertainties about climatic variations, environmental changes and non-climate factors such as levels of education and health care in a country, its economic development and public health initiatives and infrastructure readiness mean that the precise effects of climate change on human health are difficult to discern and to quantify.[27] Most scientists, however, believe that the effects of climate change on health will be negative overall, and especially severe in developing countries.[28]

Health impacts of climate change include the direct impacts of extreme events such as storms, floods, heatwaves and fires and the indirect effects of longer-term changes, such as drought, changes to the food and water supply, resource conflicts and population shifts. Increased vector-borne diseases may be associated with both direct and indirect effects. Some adverse impacts are already evident, while others are not expected to be felt until the middle of this century or even later. The World Health Organization has estimated that climate change is already responsible for measurable increases in malaria, diarrhoea and malnutrition.[29]

Projected climate changes are likely to affect the health status of millions of people, particularly those with low adaptive capacity. Some believe that the largest challenge posed by global climate change is likely to be the response to displaced populations, or 'environmental refugees'.[30]

Climate change is expected to continue to contribute to the global burden of disease and premature deaths, especially in developing countries.[31] For example, subsistence agriculture is expected to suffer, with Africa predicted to be severely affected as early as

2020, by which time water stress may affect 250 million people and crop yields in some countries are predicted to fall by 50 %.[32]

Extreme weather events

The health impacts of extreme climate-related events can include:

- fatalities and injuries,
- diseases from water contamination and other effects related to the quantity and quality of water,
- vector-borne diseases,
- food-borne diseases,
- dietary changes due to cost and availability of food,
- effects of poor air quality,
- possible impact of chemical exposures (resulting from spills from damaged pipes, industrial storage, etc.).
- impact of changes to infrastructure and essential services,
- lapsed chronic disease management,
- psychological stresses of dislocation and the experiencing of the extreme event,
- reduction in sense of community, and
- stress from loss of income and assets.

Addressing the health impacts of extreme weather events requires adequate levels of physical and human resources to meet immediate needs as well as resources to meet longer-term needs.[33]

Long term climatic change

Longer-term effects of climate change include increased temperatures, changes in sea level affecting coastal areas, changed precipitation patterns, changes in frequency of fires and droughts. These effects may have a number of health consequences, which can include:

- increases in malnutrition and consequent disorders, the result of impacts on food production (with implications for child growth and development),
- increased deaths and injury resulting from heatwaves, fires and droughts,
- increased risk of water-borne infectious diseases from poor water quality,
- increased frequency of cardiorespiratory diseases because of higher concentrations of ground-level ozone,
- increased risk of vector-borne diseases caused by altered spatial distribution of some infectious diseases;
- increase in food-borne infectious diseases, through exposure to higher temperatures,
- increases in asthma and allergic diseases from increased production of aero-allergens (spores, pollens) in some areas,
- significant population movements between climatic regions, with the possibility of displaced populations, and
- mental health problems and emotional stresses associated with social, economic and demographic dislocations (particularly with children).[34]

Increases in average temperatures mean that alterations in the geographic range and seasonality of certain infections and diseases (including vector-borne diseases such as

malaria, dengue fever, Ross River virus and food-borne infections such as *Salmonellosis*) may be among the first detectable impacts of climate change on human health.[35] It has been suggested that another early example of a direct medical consequence of global warming is an increase in kidney stones, with a 30 % rise in kidney stone disease predicted to occur in some of the driest areas of the United States if current temperature trends continue.[36]

Potential health impacts of climate change in Australia

In Australia, consequences of climatic extremes and changes to food and water supplies are predicted to have particular impacts on rural, regional and some remote Indigenous communities, with some coastal communities facing relocation due to storms and flooding.[37] Significant numbers of Australians are vulnerable to severe storms and to increases in sea level.[38]

There is a consensus that the more vulnerable members of the community – the elderly, the young and those whose health is already compromised – will be most affected by climate-related illnesses.[39] Children's exposure to climate change-related exposures and social stresses has been highlighted as a particular concern.[40] By 2056, there will also be a much higher proportion of Australians over the age of 65, as well as a rapid increase in the number of people aged 85 and over.[41] By 2020, it is expected that Australian doctors and other health professionals will be seeing patients with illnesses and conditions related to both short-term and longer-term effects of climate change.[42]

Higher temperatures

Heatwaves, especially in cities, can increase the rates of death and illness, primarily from heart and respiratory illnesses. Australia's ageing population, increasing occurrence of chronic disease and co-morbidities and high levels of urbanisation all serve to increase susceptibility to the impact of heat waves. If New South Wales were to experience a heatwave similar to one that occurred in Europe in 2003, calculations suggest that an extra 647 deaths would occur over a 2-week period.[43]

Studies suggest that over time, levels and patterns of airborne pollens and pollutants which have significant effects, on respiratory health can be affected by higher temperatures and humidity resulting from climate change.[44] While the links between ozone and atmospheric warming are complex, elevated levels of ambient ozone have been found to lead to more frequent asthma attacks and hospitalisations and greater morbidity and mortality in patients with pre-existing pulmonary or cardiovascular disease. Investigations of the potential impact of climate change on ambient ozone concentrations suggest that a continuation of current trends over the next 10 years could result in asthma-related deaths rising by almost 20 %.[45]

Vector borne diseases

The potential for the resurgence of old diseases, the redistribution of others and the emergence of new diseases have all been linked to altered climate and changing ecological balances.[46] Changes in climate can significantly alter the ecology and epidemiology of viruses and their potential to cause outbreaks of human disease. The transmission of certain arboviruses (transmitted to humans through mosquito bites) is particularly susceptible to environmental conditions that enable breeding and survival; rainfall, tides, sea level, temperature, humidity and wind all play a part. Climate change is expected to particularly affect the spread of diseases such as malaria and dengue fever.

The arboviruses of greatest concern in Australia are Ross River, Barmah Forest, Murray Valley Encephalitis, Kunjin virus, Dengue and Japanese encephalitis.[47] The spread of other mosquito-borne diseases such as Chikungunya virus may also be affected, as there is evidence that the virus, previously thought to be limited to particular species of mosquitoes, is capable of being transmitted by species distributed more widely in Queensland and in other areas throughout Australia.[48] It is believed that global warming will result in tropical conditions in Australia spreading south, as will disease vectors such as mosquitoes.

Food and water-borne diseases

Heavy rain, flooding and increased temperatures are factors that influence water-borne infections.[49] As the temperature of the environment increases, the quality and the quantity of drinking water could decrease through drought. In Australia, there are already water restrictions in many States for the first time in 20 years. It is expected that health disorders related to environmental and water contamination by bacteria, viruses, protozoa and parasites will increase as the quality of water decreases. This contamination also occurs at the other extreme as heavy rainfall and runoff influence the transport of microbial and toxic agents from agricultural fields, human septic systems and toxic dumps.[50]

Warmer temperatures also encourage food-borne infections. The incidence of bacterial food-borne diseases (and amoebic diseases) increases during the summer months and is worse in the northern regions of Australia, due primarily to the increased bacterial replication where ambient temperatures are higher. If average temperatures continue to rise, rates of food-borne diseases are also predicted to rise. However, actual health impacts will depend on factors such as food hygiene practices and contributions of different pathogens.[51]

The combination of water shortages and lack of fresh food suggests the potential for significant harm to both the environment and human health in isolated Australian communities. Changes in the amount and distribution of wildlife, fish and vegetation could also have health consequences for people in remote Indigenous communities who follow a traditional diet.

Mental health

Both extreme events and gradual climate-related changes, such as drought, may give rise to mental health problems, and these may continue for a significant period, and even be delayed.

Populations exposed to climate-related extreme weather events or disasters experience social, physical and material conditions that adversely affect mental health. Post-traumatic stress disorder, depression and anxiety may all result.[52] Because of increasing numbers of extreme weather events, the impact of natural disasters on mental health is a growing concern.

Studies have found that mental health issues remain for a considerable time after the event and that, while post-disaster morbidity is likely to decline over time, the effects of exposure to the initial disaster and losses are likely to persist.[53] A number of Australian studies have shown that bushfires increase psychological morbidity among individuals and communities experiencing loss.[54] These effects can be chronic and delayed and may require ongoing

intervention, although relatively few individuals develop serious long-term problems.[55] Diagnosis of post-traumatic stress disorder requires a clinical evaluation of symptoms.[56]

Other mental health problems occurring in a post-disaster environment include depression, bereavement complications, anxiety disorders, substance abuse and adjustment disorders.[57] Three years after Hurricane Katrina in the USA, psychiatrists and other clinicians, hospitals, government and non-government agencies, schools and community groups were still working to help adults and children overcome persistent mental health problems.[58]

Studies have found that people recover from extreme events in different ways and that a range of support services across the whole of the community are required. People who had accessed the services of the ACT Bushfire Recovery Centre reported that, after the Recovery Centre, doctors were the next most common source of help that they consulted.[59]

In addition to the impact of disaster events, coping with and moving away from longer-term effects of climate change may create mental health problems for some people. In Australia, drought has had a major impact on farm families and communities reliant on agricultural production. Levels of depression and suicide in rural Australia have been correlated with prolonged drought, and there are concerns about the likelihood of mental health problems continuing to increase, particularly among rural men.[60] Many communities, including those familiar with drought, are likely to face the challenges of longer term climate change.[61]

The AMA Position

Human health is ultimately dependent on the health of the planet and its ecosystem. The AMA believes that measures which mitigate climate change will also benefit public health. Reducing GHGs should therefore be seen as a public health priority. [62] At the same time, health systems need to be responsive to a range of health effects associated with both short-term and longer-term impacts of climate change.

In relation to climate change and human health, the AMA believes that:

- because climate change involves potentially serious or irreversible harm to the environment and to human health, it is essential to adopt mitigation strategies that reflect a precautionary approach even where uncertainties may exist in relation to scientific evidence,
- failure to achieve significant reductions in greenhouse gas emissions on a global basis is likely to cause significant public health problems,
- effective measures for improved energy efficiency, clean energy production and other emission reduction measures are likely to contribute to reducing the health impacts of climate change,
- economic assessments of the costs and benefits of mitigating climate change must incorporate the predicted public health costs of unmitigated climate change,
- there should be greater awareness, at all levels of government, of the direct and indirect impacts of policies, regulations and programs on energy use and greenhouse gas emissions,

- individuals, businesses and organisations - including in the health and medical field - should be informed about, and take measures to reduce, their greenhouse gas emissions ('carbon footprint') by making appropriate changes to consumption patterns,

- National Strategy for Health and Climate Change should be developed and implemented to ensure that Australia can respond effectively to the health impacts of gradual climate change, extreme events, and to people's medium - to long-term recovery needs. That strategy should incorporate the following:
    - localised disaster management plans for specific geographical regions that model potential adverse health outcomes in those areas and incorporate appropriate localised health and medical response measures, including for people who have been evacuated or relocated, temporarily or permanently,
    - strong and active communication linkages between hospitals, major medical centres and local weather forecasters and emergency response agencies (in at - risk locations) to maximise timely responses and efficient use of health resources in extreme weather events,
    - measures targeted to the needs of certain vulnerable population groups (older Australians, children, Indigenous communities, members of remote communities),
    - measures to address health and medical workforce needs in rural and remote communities, particularly in mental health services,
    - enhanced awareness among doctors and health professionals of the potential consequences on mental health of extreme weather events and disasters,
    - development of effective interventions to address mental health issues arising from extreme events, including those involving mass casualties and from longer-term changes, including drought,
    - programs to improve the education and awareness of health professionals about the links between health and climate change, and their understanding of the risks of new vector-borne diseases and their health impacts,
    - measures to prevent exotic disease vectors from becoming established in Australia and nationally coordinated ssurveillance for dangerous arboviruses, with public education programs promoting mosquito avoidance and measures to prevent mosquito/arthropod breeding, and
    - preparedness to deal with the temporary and permanent dislocation of people due to climate-related physical events and economic conditions.

The AMA believes that doctors and other health professionals should:

- support policies and practices compatible with a healthy and sustainable future,
- promote the community's awareness of the impacts of climate change on health,
- encourage the sustainable reduction of carbon emissions from health care facilities and organisations, and act as role models for others in reducing emissions in their own practices,
- draw attention to health issues associated with climate change in their roles as educators in health and medical faculties, residency programs and continuing education programs,
- undertake and participate in research to ascertain the effects on physical and mental health of both extreme and gradual climate change, and to quantify more rigorously the potential health effects that can be achieved by appropriate policies and practices.

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NOTES

[1] IPCC 2007a, Summary for Policymakers, in: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change,* M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 7-22. http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-spm.pdf

[2] R Garnaut., S Howes , F Jotzo F and P Sheehan 2008, Emissions in the Platinum Age: The implications of rapid development for climate change mitigation at http://www.garnautreview.org.au/CA25734E0016A131/WebObj/OXREP_paper_2-05-08/$File/OXREP_paper_2-05-08.pdf

[3] J Hansen, M Sato, P Kharecha, D Beerling, V Masson-Delmotte, M Pagani, M Raymo, DL Royer, JC Zachos 2008, Target Atmospheric CO2: Where Should Humanity Aim? Columbia University Earth Institute, New York, USA at http://www.columbia.edu/~jeh1/2008/TargetCO2_20080407.pdf

[4] Climate Institute 2006, *Top Ten Tipping Points on Climate Change*, the Climate Institute (Australia) Ltd, Sydney, p.4, www.climateinstitute.org.au; DA Jones, AB Watkins and K Hennessy (2005) Humans do contribute to global warming, *Engineers Australia*, Sept., pp.44-47.

[5] IPCC 2007b, Summary for Policymakers, *Climate Change 2007: Mitigation – Contribution of Working Group III to the 4th Assessment Report of the Intergovernmental Panel on Climate Change*, p.3, 4 (B. Metz, O. Davidson, PR Bosch, R. Dave, LA Meyer (eds), Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. at http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-spm.pdf); BL Preston and RN Jones 2006, Climate Change Impacts on Australia and the Benefits of Early Action to Reduce Global Greenhouse Gas Emissions: a consultancy report for the Australian Business Roundtable on Climate Change, CSIRO, Melbourne, p.7.

[6] DA Jones, AB Watkins and K Hennessy 2005, Humans do contribute to global warming, *Engineers Australia*, Sept., pp.44-47

[7] BL Preston and RN Jones 2006, p. 6; DA Jones, AB Watkins and K Hennessy 2005, Humans do contribute to global warming, *Engineers Australia*, Sept., pp.44-47.

[8] BL Preston and RN Jones 2006,; Bali Climate Declaration by Scientists (2007), Climate Change Research Centre, University of New South Wales, Sydney, Australia. (http://www.climate.unsw.edu.au/bali/)

[9] BL Preston and RN Jones 2006.

[10] PR Epstein and E Mills (eds) 2005, *Climate Change Futures: Health, Ecological and Economic Dimensions,* Center for Health and the Global Environment, Harvard Medical School, p.4

[11] B Pittock (ed) 2003, *Climate Change: An Australian Guide to the Science and Potential Impacts*, Australian Greenhouse Office, Canberra http://www.greenhouse.gov.au/science/guide/pubs/science-guide.pdf; DA Jones, AB Watkins and K Hennessy 2005,pp.44-47

[12] CSIRO and the Australian Bureau of Meteorology 2007, *Climate Change in Australia: observed changes and projections*, report for the Australian Climate Change Science Program, at www.climatechangeinaustralia.gov.au/resources.php

[13] DA Jones, AB Watkins and K Hennessy 2005, p.44; A Haines , RS Kovats , D Campbell-Lendrum, C Corvalan 2006, Climate change and human health: impacts, vulnerability, and mitigation, *The Lancet* 367: 9528 , pp. 210 –2109.

[14] CSIRO and the Australian Bureau of Meteorology 2007, p.3.
[15] B Pittock (ed) 2003, p.4

[16] Environmental Health Directorate 2008, *Health Impacts of Climate Change: adaptation strategies for Western Australia*, 2008, WA Department of Health, p.7

[17] Australian Greenhouse Gas Office 2005, Trends in Extreme Weather Events: Australia and Globally, Past and Future, Department of Environment & Heritage, April, at http://www.climatechange.gov.au/science/hottopics/pubs/topic8.pdf.

[18] BL Preston and RN Jones 2006, pp.5, 22.

[19] P Bi and KA Parton 2008, Effect of climate change on Australian rural and remote regions: what do we know and what do we need to know? (review article), *Aust J Rural Health* 16, 2-4.

[20] CSIRO and the Australian Bureau of Meteorology 2007, p.2.

[21] CSIRO and the Australian Bureau of Meteorology 2007, p.7.

[22] K. Hennessy, R. Fawcett, D. Kirono, F. Mpelasoka, D. Jones, J. Bathols, P. Whetton, M. Stafford Smith, M. Howden, C. Mitchell, and N. Plummer, July 2008, *'An assessment of the impact of climate change on the nature and frequency of exceptional climatic events'* , CSIRO and the Bureau of Meteorology for the Australian Government's National Review of Drought Policy, http://www.daff.gov.au/__data/assets/pdf_file/0007/721285/csiro-bom-report-future-droughts.pdf.

[23] CSIRO and the Australian Bureau of Meteorology 2007, p..

[24] Australian Greenhouse Gas Office 2005.

[25] Australian Greenhouse Office 2006, *Assessing and mapping Australia's coastal vulnerability to climate change: Expert Technical Workshop*, Department of Environment & Heritage, 13-14 December 2005, http://www.climatechange.gov.au/impacts/publications/coastal-workshop.html; W Steffan 2008, 'The Science of Climate Change: Implications for the Coastal Zone', paper presented to the Coast to Coast Collaboration: Crossing Boundaries conference, 18-22 August, Darwin https://www.coast2coast.org.au/plenary-abstracts.html#steffen.

[26] Australian Greenhouse Gas Office 2005.

[27] IPCC 2007a, p.9; Environmental Health Directorate 2008.

[28] IPCC 2007a, p.12.

[29] AJ McMichaelJ, D Campbell-Lendrum , S Kovats , et al. 2004, Climate Change, In: Ezzati M, Lopez AD, Rodgers A, Mathers C (eds.) *Comparative Quantification of Health Risks: Global and Regional Burden of Disease due to Selected Major Risk Factors.* Geneva: World Health Organization; 2004. pp. 1543-1650. http://www.who.int/publications/cra/chapters/volume2/1543-1650.pdf; World Health Organization 2002, *World Health Report 2002: Reducing risks, promoting healthy life*, Chapter 4, WHO, Geneva, http://www.who.int/whr/2002/chapter4/en/index7.html.

[30] JA Patz and M Khaliq, 2002, Global climate change and health: challenges for future practitioners, *JAMA* 287:17, 1 May, p.2284; W Steffan 2008.

[31] British Medical Association2008, *Health Professionals – Taking Action on Climate Change - 'What are the health implications?'*, April, http://www.bma.org.uk/ap.nsf/content/climatechange.

[32] M Chan 2007, 'Climate change and health: preparing for unprecedented challenges', David E. Barmes Global Health Lecture, Bethesda, Maryland 10 Dec. at www.dea.org.au.

[33] M Traub, D A Bradt and A P Joseph 2007, The Surge Capacity for People in Emergencies (SCOPE) study in Australasian hospitals, *MJA* 186: 394–398; E Salinsky 2008, Strong as the weakest link: medical response to a catastrophic event, Background Paper No. 65, National Health Policy Forum, George Washington University, Washington DC, 8 August, www.nhpf.org.

[34] G Horton and T McMichael 2008, *Climate Change Health Check 2020*: *a report prepared for the Climate Institute of Australia*, Doctors for the Environment, www.dea.org.au, p.10.

[35] WHO 2003, Climate change and human health – risks and responses – Summary, Geneva, at www.who.int/globalchange/climate/summary; B Pittock (ed) 2003, Ch 4, Potential Impact of Climate Change: Australia, at http://www.climatechange.gov.au/science/guide/pubs/chapter4.pdf; G Horton and T McMichael 2008.

[36] T Brikowski, Y Lotan and MS Pearle 2008, Climate-related increase in the prevalence of urolithiasis in the United States, *Proceedings of the National Academy of Sciences,* published online before print July 14, doi: 10.1073/pnas.0709652105.

[37] G Horton and T McMichael 2008.

[38] G Horton and T McMichael 2008, p.12.

[39] P Sly, E Hanna, B Giles-Corti, J Immig, T McMichael 2008, Environmental Threats to the Health of Children in Australia: The need for a National Research Agenda, supported by the ARACY ARC/NHMRC Research Network, World Health Organization Collaborating Centre for Research on Children's Environmental Health, Perth**,** March.

[40] P Sly, E Hanna, B Giles-Corti, J Immig, T McMichael 2008.

[41] Australian Bureau of Statistics 2008, Population Projections, Australia, 2006 to 2101, Cat. No. 3222.0, 4 Sept.

[42] G Horton and T McMichael 2008.

[43] Epstein PR and E Mills (eds) 2005, p.55 – 59; Faculty of Public Health 2008, *Sustaining a Healthy Future: Taking action on climate change*, London, p.6.

[44] British Medical Association 2008; ML Bell, R Goldberg, C Hogrefe et al 2007, Climate change, ambient ozone and health in 50 US cities, *Climatic Change* 82 (1-2), May, pp. 61-76, at http://www.springerlink.com/content/7380101v7q674581/; Union of Concerned Scientists 2008, Explaining Global Warming – What's Ozone Got to Do with It?, at: www.ucsusa.org/ssi/archive/ozone-climate-connection.html

[45] KJ Bransford 2002, Global climate change and air pollution: common origins with common solutions, *JAMA* 287:17, p.2285

[46] PR Epstein and E Mills (eds) 2005 p.33; M Chan 2007.

[47] RA Dunstan, CR Seed and A J Keller, 2008, Emerging viral threats to the Australian blood supply, *ANZJPH* 32:4, p.354-360

[48] Australian Biosecurity Cooperative Research Centre 2008, Aussie mozzies a Chikungunya risk, media release, 11 Feburary, at http://www1.abcrc.org.au/uploads/89f0c50a-9c28-4707-b25b-bdd5a7848440/docs/Media_Release_-_Chikungunya.pdf; : D F Johnson et al 2008, Chikungunya virus infection in travellers to Australia, *Medical Journal of Australia* 188:1, p.41-3.

[49] British Medical Association 2008.

[50] J Patz and R Kovats 2002, Hotspots in climate change and human health. *BMJ* ;325:1094-1098.

[51] British Medical Association 2008.

[52] D Satcher, S Friel and R Bell 2007, Natural and Manmade Disasters and Mental Health, *JAMA* 298:21, 5 Dec., p.2540

[53] P Camilleri, C Healy, E Macdonald, S Nicholls, J Sykes, G Winkworth, and M Woodward 2007, Recovering from the 2003 Canberra bushfire: a work in progress, report for Emergency Management Australia (grant 04/2005) at http://www.ema.gov.au/agd/ema/rwpattach.nsf/VAP/(63F21BC6A4528BAE4CED2F9930C45677)~Recovery2003_May3007.pdf/$file/Recovery2003_May3007.pdf; L Lamberg 2008, Katrina's Mental Health Impact Lingers: Patients Face Shortages of Facilities, Clinicians, *JAMA* 300:9, p.1011-1013

[54] In a 2006 survey, of 500 people who had had direct experience of the 2003 bushfires in the Australian Capital Territory (ACT), 40 percent indicated that they had experienced one or more symptom of post-traumatic stress (PTS), with 13% reporting a level of PTS that could meet diagnostic criteria for post-traumatic stress disorder. Injury, perceived threat to life, and disaster-related losses were the strongest predictors of post-traumatic stress symptoms. Survey respondents highlighted a number of negative effects on their health and well-being and some reported lasting effects on children.

[55] P Camilleri et al 2007, p.69.

[56] P Camilleri et al 2007, p.70.

[57] P Camilleri et al 2007, p. 73.

[58] L Lamberg 2008, p.1011-1013.

[59] P Camilleri et al 2007, p.100

[60] Environmental Health Directorate 2008, p.27; M Alston and J Kent, 'The Big Dry: the link between rural masculinities and poor health outcomes for farming men', *J of Soc* 2008 44(2):133-147, p.136.

[61] HL Berry, BJ Kelly, IC Hanigan, JH Coates, AJ McMichael, JA Welsh, T Kjellstrom 2008, *Garnaut Climate Change Review: Rural mental health impacts of climate change*, National Centre for Epidemiology and Population Health, ANU College of Medicine and Health Sciences, June (http://www.garnautreview.org.au/CA25734E0016A131/WebObj/03-DMentalhealth/$File/03-D%20Mental%20health.pdf

[62] A Haines 2007, Comment: Energy and health series, *The Lancet*, 2007; 370:922.

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AMA Position Statement

Involvement of GPs in Disaster and Emergency Planning

August 2012

1. Background and History

This Position Statement has been developed to help policymakers at all levels of government and medical practitioners across Australia be more aware of the issues involved in natural disaster planning and emergency management, and the role of GPs in these situations.

Australia has always had its share of natural disasters. In any disaster situation, medical practitioners are called upon and volunteer to provide medical assistance and treatment in whatever way is required. During a natural disaster, General Practitioners (GPs) working in a disaster-affected area will immediately respond to the needs of their local community, and GPs from other locations will often volunteer to provide help on the ground, in hospitals, and in assisting local GPs to meet the increased need for services.

GP involvement in natural disasters has worked on the basis of goodwill and a strong volunteering ethic among medical practitioners at the time of a disaster. Planning for GP involvement has been ad hoc and has varied considerably across jurisdictions.

A concerted response to have GPs involved in natural disaster planning and part of response teams during a disaster or emergency across all jurisdictional layers will ensure all parts of Australia are better equipped to deal with the many primary health care needs that arise when a natural disaster strikes.

2. Medical treatment and care for people affected by natural disasters/emergencies

Planning for emergency or disaster situations, particularly those that involve mass casualties, is incomplete and substandard if it does not consider and make provision for how GPs could effectively contribute to the response both on and off site.

In Australia, dedicated emergency management personnel take the role of leading an emergency management response. Medical treatment and care for people affected by natural disasters and emergencies, however, is a significant aspect of emergency management. GPs and General Practices are at the forefront of providing this care. For this reason GPs need to be part of the planning for - and response to – natural disasters and emergencies.

Disaster management planning and preparedness occurs at every level of government in Australia. In particular, State and Territory Governments have legislative responsibility for matters such as assembly points, situation briefing, and chain of command and reporting requirements. As such, it is particularly important that the role of the GP be recognised and incorporated in State/Territory

Government planning. Local governments also take responsibility for planning and management of disasters at the local level.

The Commonwealth Government has a significant role as the main provider of health funding, particularly at the primary health care level. The Commonwealth also has a management role when disasters stretch over one or more jurisdictions, or have the potential to affect the health of people across jurisdictions.

The need to involve doctors, particularly GPs, in natural disaster preparedness and planning is being recognised worldwide. The World Medical Association (WMA) has recognised the growing need for doctors to be part of the medical planning and response to disasters and emergencies:

> *In light of recent world events, it is increasingly clear that all physicians need to become more proficient in the recognition, diagnosis, and treatment of mass casualties under an all-hazards approach to disaster management and response. They must be able to recognise the general features of disasters and public health emergencies, and be knowledgeable about how to report them and where to get more information should the need arise. Physicians are on the front lines when dealing with injury and disease - whether by microbes, environmental hazards, natural disasters, highway collisions, terrorism, or other calamities. Early detection and reporting are critical to minimise casualties through astute teamwork by public-and private-sector health and emergency response personnel.*[1]

In Australia, during many types of natural and other disasters, GPs have been at the forefront of providing care and treatment and offering whatever medical support is necessary in a crisis situation. This Position Statement aims to ensure that the role of the GP in emergency and disaster situations is formally recognised and that, wherever possible, GPs:

- are part of disaster and emergency management response planning; and
- are included in the emergency response teams at the time of any crisis or disaster.

3. AMA Position

The AMA calls on each level of government in Australia to give consideration to the role that GPs can play in assisting with emergency or disaster situations. There are a number of roles that GPs can play in an emergency or disaster situation. These include:

1. Participating in medical response teams to assist on-site with triaging, field treatment, and supervising the provision of first aid;
2. Treating the walking wounded either on-site, at evacuation centres, or in rooms (including providing vaccinations if needed);
3. Providing support (i.e. backfill) for hospitals to maintain their capacity function; and
4. Ensuring continued community access to primary health care.

[1] World Medical Association, *WMA Declaration of Montevideo on Disaster Preparedness and Medical Response*, adopted by the 62nd WMA General Assembly, Montevideo, Uruguay, October 2011 (accessed at: http://www.wma.net/en/30publications/10policies/d3/)

3.1 Planning and response preparation for a natural disaster

Some GPs hold a Major Incident Medical Management (MIMM) certificate or equivalent and some GPs are part of Australian Medical Assistance Teams (AUSMAT), which are teams available for deployment in jurisdictional and international emergency situations.

Planning and response preparation for a natural disaster requires jurisdictional plans to factor in the skills and abilities of GPs holding MIMM certificates and members of AUSMATs, as well as factoring in the roles of other GPs who can provide care, treatment and support during a natural disaster.

Emergency management and disaster preparedness training tailored to GPs should be provided, and be easily accessible for all interested GPs.

All jurisdictions need to have databases to record:

- the GPs with the appropriate training who are willing to participate in a medical response team;
- the GPs who are willing to assist as required out of rooms; and
- the GPs who are willing to assist as required in their rooms.

Appropriate GP representation is required on emergency/disaster planning committees across all levels of government.

In addition, each jurisdiction needs a communication protocol to contact GPs in an emergency/disaster situation. These protocols should also include provision to draw on retired GPs living in the area as an extra resource.

3.2 Provision of information in an emergency situation

In a natural disaster or emergency situation, GPs will need to be provided with the following information:

- Closest assembly point;
- A situation briefing – including nature of emergency and contribution required;
- Communication protocols, covering:
    - All necessary contact numbers and details for emergency/disaster relief personnel;
    - Chain of command;
    - Radio protocols – including:
        - When to use
        - Terminology to use
    - Reporting requirements – including required regularity of situation reports; and
- Triage protocols to be used.

3.3 Provision of equipment and other tools

GPs will also need to be provided with:

- Personal protection equipment and any other clinical equipment (e.g. Thomas Packs), and information about where additional equipment can be accessed on-site;

- Vaccines for medical staff and for general use in the population if required;
- Standard issue Doctor First Aid pack, a supply of duck-billed facemasks, gloves, and other safety equipment. Safety and protection equipment should be marked "Doctor" to facilitate quick and easy identification; and
- All doctors working as part of a medical or disaster response should be issued with readily identifiable jackets marked "Doctor".

3.4 Other jurisdictional planning factors

Other factors to include in jurisdictional planning include:

- GPs to be included in simulated emergency events and any other additional training to ensure effectiveness as part of any in-field medical response team provided by the jurisdiction;
- Appropriate workers' compensation and death/disability insurance arrangements to support GPs involved in natural disaster response activities;
- Communication protocols to ensure GPs are provided with the latest up-to-date information about policies, government health messages, and government assistance measures. This is particularly important when messages are given to the community to consult their GP about the health impacts of a natural or other type of disaster; and
- Collecting GP feedback following an emergency or disaster response as a critical feedback loop for future planning.

3.5 Standard protocols for use in an emergency/disaster situation

The Commonwealth Government should retain standard protocols to use in an emergency or disaster situation including:

- Flexible use of Medicare Provider Numbers;
- Access to Medicare Benefits while practising in temporary premises;
- Access to services for people who have lost Medicare/DVA cards;
- Flexibility in claiming some of the MBS mental health items; and
- Providing essential medicines and filling scripts outside the standard PBS rules.

4. Name of Committee having principal carriage of the Position Statement

The AMA Council of General Practice (AMACGP) has principal carriage for this Position Statement.