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Australian Government
Department of Health and Ageing

Submission to the
House of Representatives

Inquiry into Climate Change and Environmental Impacts on Coastal Communities

This submission addresses the third term of reference “the impact of climate change on coastal areas and strategies to deal with climate change adaptation, particularly in response to projected sea level rise”. It does not attempt to cover the science of climate change or projected impacts but to briefly outline some of the potential health implications of climate change for coastal communities.

Climate change effects on health

There is now scientific consensus that the consequences of climate change on human health in Australia will be negative and will create increased demand on the Australian health system. See the most recent Intergovernmental Panel on Climate Change (IPCC) report (Confalonieri *et al.* 2007) for an international perspective and McMichael *et al.* (2003) for an Australian overview. The literature identifies a number of likely impacts of climate change on health in Australia and they are listed here. Note that the list provides a general perspective on climate change impacts, and is not specific to coastal communities.

- Mortality and morbidity are likely to increase due to more frequent and intense extreme weather events including storm surges, cyclones and bushfires.
- Drought is likely to lead to an increase in mental health problems, particularly in rural communities.
- Morbidity and mortality associated with more frequent and severe heatwaves is likely to increase affecting the elderly in particular.
- Morbidity and mortality from increased exposure to ground-level ozone and other air pollutants (eg nitrogen oxides, particulate matter) and aeroallergens such as pollens is likely to increase. People with pre-existing illness, particularly respiratory and cardiac, will be at particular risk.
- Vector-borne infectious diseases are likely to increase due to changing conditions for vectors and hosts. Geographic ranges of some diseases are likely to change putting new populations at risk.
- Food- and water-borne disease outbreaks are likely to increase, including, for example, diarrhoeal disease following floods and increased temperature-sensitive food-borne diseases such as salmonellosis. Algal blooms that cause human disease are also likely to increase.
- Water scarcity is likely to increase and reduce food availability, particularly fresh fruit and vegetables.
- Internal migration and immigration, particularly from neighbouring island countries, is likely to increase, most likely from coastal areas that are inundated by sea level rise.

Climate change will create increased demand for primary care, mental health and emergency services and place greater stress on the Australian health system generally.

Vulnerable populations and equity considerations

Within all communities, including coastal communities, the following populations are particularly vulnerable.

In Australia, populations likely to be vulnerable to climate change include:

- elderly people as they are more vulnerable to high ambient temperatures;
- rural communities in southern and eastern Australia that will be exposed to long-term drying with potential mental health effects, among other factors;
- remote Aboriginal and Torres Strait Islander communities facing heat, drying, water shortage, loss of traditional foods, and extreme weather events;
- people with pre-existing medical conditions that may be exacerbated by events such as heatwaves and high air pollution days;
- children who are vulnerable to high ambient temperatures and stress related to environmental change including drought; and
- people from lower socio-economic groups, including homeless people, who have reduced capacity for personal adaptation such as heat-proofing housing.

Neighbourhood-level factors can also be important. In a 1995 heatwave in Chicago, mortality rates were higher in areas of the city with low levels of social cohesion than in neighbourhoods with comparable socio-economic status and building quality but better social cohesion (Woodward 2007).

Climate change is likely to disproportionately affect people with the least capacity to adapt. Regions and populations that are already under stress, including from health workforce shortages, will have a lower capacity to respond and therefore are particularly vulnerable. Innovative approaches will be required to address the multiple challenges.

The impacts of climate change are not distributed evenly, with poorer countries carrying a disproportionate burden. However, adaptive capacity needs to be improved in all countries. The impacts of recent hurricanes (Katrina and Rita in the USA) and heatwaves (in Europe during 2003) show that even high-income countries are not always well prepared to cope with extreme weather events.

Coast-specific health implications of climate change

Climate change related threats to health that are of particular importance to coastal communities include sea level rise, storm surges, and, in some areas, flooding, cyclones and vector-borne disease. However, as noted in Abuodha & Woodroffe (2006):

“There is considerable literature on health and how this may be affected by climate change, but little of it appears focused specifically on the coast. Ecological impacts such as desertification, biodiversity and bushfires have been considered generally in an Australian context, but are not particularly coastal in focus.”

The following is an extract from the most recent IPCC report which identifies the health vulnerabilities of populations in coastal and low-lying areas.

“Climate change could affect coastal areas through an accelerated rise in sea level; a further rise in sea-surface temperatures; an intensification of tropical cyclones; changes in wave and storm surge characteristics; altered precipitation/runoff; and ocean acidification. These changes could affect human health through coastal flooding and damaged coastal infrastructure; saltwater intrusion into coastal freshwater resources; damage to coastal ecosystems, coral reefs and coastal fisheries; population displacement; changes in the range and prevalence of climate-sensitive health outcomes; amongst others. Although some Small Island States and other low-lying areas are at particular risk, there are few projections of the health impact of climate variability and change. Climate-sensitive health outcomes of concern in Small Island States include malaria, dengue, diarrhoeal disease, heat stress, skin diseases, acute respiratory infections and asthma.”

The following sections elaborate on Australia’s situation and current work on some areas relevant to coastal communities.

Sea level rise and population migration

We note that population migration as a result of sea level rise has significant health implications and has been canvassed in other submissions. Population migration away from coastal areas, particularly islands, is likely to disrupt cultural and social systems, as well as causing emotional and possible physical harm. This has important ramifications for communities in the Torres Strait Islands and elsewhere.

Mosquito-borne disease

Australia is susceptible, particularly in our northern border regions, to vector-borne diseases that may occur occasionally as a result of unusual events such as the incursion of an exotic mosquito or other disease-carrying vectors. However, the effects of climate change on vector ecology and mosquito-borne disease are complex and very difficult to predict, and any evaluation of potential effects will need a detailed examination of site-specific factors likely to influence the outcomes on human health.

Responsibility for public health including endemic vector control rests with the states and territories. The Australian Government, through the Department of Health and Ageing, has, in the past, provided financial assistance to vector control programs to increase state and territory capacity to eliminate exotic vectors before they become more widespread and potentially lead to increased risk of disease transmission.

Aedes albopictus and *Aedes aegypti* are mosquitoes capable of spreading dengue fever. In Australia dengue fever normally only occurs in north Queensland due to the presence of both the mosquito vector *Aedes aegypti* in the northern coastal region, and the proximity to off shore areas where dengue is endemic.

The Northern Territory Department of Health and Community Services confirmed in late February 2004 that *Aedes aegypti* were breeding in Tennant Creek. This was the first time in nearly 50 years that the mosquito had established breeding sites in the NT. *Aedes aegypti* is an exotic mosquito in the Northern Territory which has the potential to transmit dengue fever. To assist in the funding of the personnel and operational costs associated with the elimination of the *Aedes aegypti* mosquito in Tennant Creek, the Australian Government provided the

Northern Territory Government with \$1.3 million for mosquito control operations in Tennant Creek in June 2004 and September 2005. The elimination program was successful.

The Northern Territory Government also discovered *Aedes aegypti* on Groote Eylandt. The Commonwealth Department of Health and Ageing provided \$582,000 in 2007-2008 towards an elimination program on Groote Eylandt. The elimination program was successful.

Following the detection of *Aedes albopictus* in the Torres Strait in April 2005, the Australian Government provided Queensland Health \$750,000 for mosquito control operations in the Torres Strait in April 2006. A further \$2.15 million was allocated for 2007 to 2009 for continued mosquito control operations. The purpose of the program is to control and possibly eliminate *Aedes albopictus* from the Torres Strait, improve community water storage infrastructure in Torres Strait communities, increase knowledge in Torres Strait communities regarding the prevention of dengue fever and mosquito control in general; and increase community council activity in controlling container breeding mosquitoes.

The risks of mosquito-borne diseases are already a significant concern. The last year has seen a record number of cases of dengue fever in countries to the north of Australia with increasing concerns that chikungunya fever may become established in Australia. The future success of mosquito control operations will depend on collaboration of Australian jurisdictions and agencies along with early community engagement and intersectoral collaboration.

Mental health

Drought affects coastal areas as well as inland areas and is serviced by the Department of Health and Ageing-funded *Mental Health Services in Rural and Remote Areas* (MHSRRA) program. The MHSRRA program provides funding for allied and nursing mental health services, including those provided by social workers, psychologists, mental health nurses, occupational therapists, Aboriginal health workers, and Aboriginal mental health workers in rural and remote communities throughout Australia.

The MHSRRA program provides \$55.5 million over five years, and has co-funding from the *National Suicide Prevention Strategy* to the value of \$1.6 million. The Strategy has an increased emphasis on suicide prevention in rural and remote areas and is establishing links with Council of Australian Governments (COAG) mental health initiatives including the MHSRRA program.

In the first stage of the program nine organisations covering coastal areas were funded, three of which are in drought affected areas. These organisations are located in the Northern Territory, South Australia, Queensland, Tasmania and Western Australia. Under the second stage of the program, eleven organisations that included coastal areas were funded, five of which are in drought affected areas. These organisations are located in the Northern Territory, New South Wales, South Australia, Queensland, Tasmania and Western Australia.

Adapting to climate change

Some of the most important adaptation responses to protect health will take place outside the health sector. Examples include efforts to reduce the frequency and intensity of bushfires and improving infrastructure to reduce flooding of residential areas. The *National Climate*

Change Adaptation Framework, agreed by COAG in April 2007, sets the direction for national adaptation activities, including for human health. However, state and local governments have begun work in this area. The West Australian Government (2007) produced a set of adaptation strategies for the health impacts of climate change. The West Australian publication notes the vulnerability of coastal communities, particularly through potential damage to infrastructure.

The Department of Climate Change has advised that they are funding a series of five integrated assessments of which four are in coastal areas. The project in the Gold Coast specifically addresses health impacts of climate change but is yet to produce a public report.

In designing mitigation and adaptation responses in different sectors, such as urban planning, consideration needs to be made of the potential effects on other sectors, including health. Opportunities exist to maximise health outcomes by appraising health threats and benefits of various mitigation and adaptation options. Potential co-benefits of mitigation and adaptation activities need to be considered in the context of the particular needs of all communities, including coastal communities.

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