

Climate Change and Human Health

2004

Human induced climate change is one of the most intensely debated issues of our time. The Intergovernmental Panel on Climate Change (IPCC) is an international scientific collaboration established by the World Meteorological Society and the United Nations Environment Program to assess scientific, technical and socio-economic information relevant to the understanding of climate change, its potential impact and options for adaptation and mitigation ¹.

The IPCC have concluded that on the balance of available evidence it is clear that human activities - predominantly the burning of fossil fuels (such as oil, coal and gas) and changes in land cover due to deforestation- have contributed to recent global changes in climate. Since the pre-industrial age there have been increases in the concentrations of greenhouse gases such as carbon dioxide, methane and nitrous oxide well in excess of the changes that occurred over the previous thousands of years.

It is postulated that the observed warming (particularly over the past 50 years) is most probably due to this increase in greenhouse gas concentrations. As a consequence there is likely to be future changes in climate that will include additional warming, changes in rainfall, sea level rises and changes in the frequency and intensity of some extreme events ².

It is believed that the rate of change in climate is faster now than in any other period in the past thousand years and the IPCC foresees "an increase of 1.0⁰c - 3.5⁰c in the global mean temperature by the year 2100, with considerable regional variations" ³. This forecast is necessarily uncertain because the sensitivity of climate to atmospheric change is imperfectly understood. Nevertheless, the expected rate of climate change over the coming century would be far greater than any natural change in world climate since the advent of agriculture 10 000 years ago ⁴.

This Global climate change as projected by climatologists will have a major impact on human health on a scale not previously encountered by human society ⁵. The human toll of climate change will largely depend on a person's location, access to health services and the availability of critical incident and public health infrastructure. Because of this climate change is "arguably one of the largest environmental and health equity challenges of our times as the wealthy energy consuming nations are responsible for the emissions that cause global warming yet poor countries are most at risk" of the detrimental effects ⁶.

Health Impacts in Australia

The impact of climate change in Australia will depend on the rate and extent of warming, as well as the adaptive capacity of our society. Health outcomes are multicausal and as such it is difficult to predict the manner in which global warming may impact on the health of our population. However scientists have consistently predicted that most effects of climate change on health would be adverse ⁷.

Health impacts may entail increased mortality rates from existing diseases. Also new climatic-environmental conditions, not previously encountered, may also increase the likelihood of unfamiliar health impacts arising. These impacts could be direct such as through heat related illness or indirect such as through the impact of global warming on patterns of disease transmission.

1. Heat Related Illness

There is documented evidence regarding the effects of heat waves on mortality rates. During the Northern hemisphere summer of 2003 it is estimated that in excess of 19 000 people died from heat related illnesses as high temperatures swept across Europe. During this crisis health systems were severely stretched coping with the increased incidence of heat stroke and heat related mortality – with the very young and the elderly most affected.

However there is evidence that humans have an adaptive capacity in relation to heat and that people living in areas where the average summer temperature is higher are less likely to die in heat waves than people in areas with low average summer temperatures.

This observation bodes well for Australia's capacity to cope with potentially higher summer temperatures. Conversely a rise in the average winter temperature may have a positive impact on the mortality rate due to a decline in deaths due to respiratory illnesses that historically peak during the colder months.

2. Health Effects of Extreme Events

Projections of frequent and extreme weather events such as floods, droughts, hurricanes, and tornadoes would be a significant concern to the medical profession.

In addition to the obvious loss of life there are also secondary health effects from extreme events. These occur due to displacement of large numbers of people as well as the interruption to key services and infrastructure. A characteristic of extreme events in developing worlds is the increased transmission rate of infectious diseases. These are rarely seen in developed countries such as Australia however this may become more of a problem if the frequency and magnitude of these events escalates.

In Australia the risk of mental health problems associated with exposure to these events needs to be addressed through disaster management plans. The residual effects on "the mental health effects of surviving an extreme event, possibly losing loved ones, losing homes and possessions and being displaced, can be significant and long lasting"⁸.

Extreme events in our region may lead to the additional problem of forced environmental migration. This is of major concern as many of our Pacific Island neighbours are at risk of being obliterated if sea levels rise or if extreme weather batters island nations to the degree that the cost of repairing infrastructure means that those nations cease to be economically viable.

The health burdens experienced by refugees include overcrowding, lack of shelter, and competition for resources. These problems presented by displaced persons may turn out to be the largest public health challenge regarding the global effects of climate change with conflict one of the worst results emerging from such forced migration⁷.

3. Infectious Diseases

Vector Borne

Climate change will also have significant indirect health effects such as altered distribution of infectious diseases. An example would be the transmission of mosquito-borne diseases that are caused by pathogens being transmitted from human to human or animal to human via mosquitoes. The most common mosquito-borne disease in Australia is epidemic polyarthritis, which is caused by infection with either Ross River virus or Barmah Forest virus⁹.

It is believed that as the climate warms up, the tropical regions in Australia will spread south as will these disease vectors. Other mosquito-borne diseases that could increase as the

temperature increases are malaria, dengue fever, Australian encephalitis, and Japanese encephalitis.

Water Borne

As the temperature of the environment increases, the quality and the quantity of drinking water could decrease as water sources in some areas become threatened by drought.

We are already seeing water restrictions in many states for the first time in twenty years. As a consequence, health disorders related to environmental and water contamination by bacteria, viruses, protozoa and parasites will invariably increase as the quality of water decreases. This contamination also occurs at the other extreme as heavy rainfall and runoff influences the transport of microbial and toxic agents from agricultural fields, human septic systems and toxic dumps⁷.

Many remote communities such as Aboriginal communities that follow a traditional diet could be vulnerable to health problems due to predicted changes in the amount and distribution of wildlife, fish and vegetation. When this is combined with water shortages, this is a potential ecological disaster for these and other isolated Australian communities.

Food Borne

“Food borne disease can be caused by a number of different viruses, bacteria and parasites. Food borne disease usually takes the form of gastrointestinal symptoms such as diarrhoea and vomiting, although occasionally more severe disease such as haemolytic uraemic syndrome or hepatitis can result”⁹.

It has been established that the incidence of bacterial food borne diseases increases during the summer months and is worse in the Northern regions of Australia. This is largely due to the increased bacterial replication in situations of higher ambient temperatures. If the average temperatures in Australia continue to rise then it is likely that the rates of food borne diseases will also rise.

Health Impacts globally

The global impact of climate change is difficult to predict and measure. But signs are clearly emerging that in addition to the immense economic and ecological costs projected to result from climate change, there is also the potential for major and unpredictable adverse public health impacts.

As a wealthy developed nation Australia is likely to have the capacity to adjust to the challenges faced by changes in our environment. However climate change is a global challenge and requires a global solution. Greenhouse gas emissions have the same impact on the atmosphere regardless of their origin. Australia has an obligation as a major emitting country to commit to significant long-term reductions in greenhouse gas emissions.

Less developed countries may exhibit socio-economic vulnerability. This means that they are relatively less able to purchase and maintain resources and technology to protect and promote population health. Increases in information, education, transportation and social services can promote good health and reduce the potential health impacts of climate change. In developed countries the most disadvantaged groups, with least choice about where to live and what to eat, suffer the short-term impacts most. In developing countries the future impacts of climate change will adversely affect the poor. Climate change threatens the ability of countries, particularly in low lying coastal areas, to meet basic human needs of adequate food, clean water, a healthy environment, and safe shelter.

The Kyoto Protocol of the United Nations Framework Convention on Climate Change, which seeks climate stability and sustainable development through global cooperation, is the

mechanism by which Australia can achieve this. There is a strong positive relationship between absolute poverty and ill-health. Deprived communities, lacking wealth, social institutions, environmental security and robust health, are likely to be at greatest risk of adverse health from environmental change¹. This constitutes a powerful argument for Australia to act in a globally responsible manner.

The AMA Position

The AMA believes that human health is ultimately dependent on the health of the planet and its ecosystem.

The AMA believes it is possible to mitigate the possible consequential health effects of climate change through improved energy efficiency, clean energy production and other emission reduction steps.

The AMA calls on the Federal Government to ratify and implement the Kyoto protocol. Failure to commit to reducing greenhouse gas emissions has the potential to cause significant global public health problems.

The AMA believes that an effective emissions control program could be instituted without having a negative impact on the Australian economy. This can best be achieved by combining energy conservation with new alternative technologies that would reduce dependency on fossil fuels.

The AMA believes that the Federal Government should implement a National Greenhouse Policy that engages all Australians in ensuring that we meet the Kyoto target and start to dramatically cut our greenhouse pollution.

That AMA recognises the importance of developing renewable energy sources as a means of affecting global climate change and its health ramifications. The AMA calls on the Federal Government to set a Mandatory Renewable Energy Target (MRET) of 10% by the year 2010.

The AMA supports research, education, prevention, monitoring, and assessment relating to the public health issues that may arise from climate change.

Reference:

¹ The Intergovernmental Panel on Climate Change (IPCC).

² Albritton D, Allen M, Baede A. Climate Change 2001: the scientific basis. Intergovernmental panel on Climate Change (IPCC) Working Group I. Summary for policy makers. Third Assessment report. New York, NY, USA: Cambridge University Press, 2001.

³ Haines A, McMichael A, Epstein P. Environmental Health: 2. Global Climate Change and Health. CMAJ 2000;163(3):729-734.

⁴ McMichael A, Haines A. Global climate change: the potential effects on health. BMJ 1997;315:805-809.

⁵ McMichael A, Githeko A. Climate Change 2001: impacts, adaptation and vulnerability. contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate change. Cambridge, UK: Cambridge University Press, 2001.

⁶ McMichael A, Woodruff R. Climate Change and Human Health : What do we know? MJA 2002;177:590-591.

⁷ Patz J, Kovats R. Hotspots in climate change and human health. BMJ 2002;325:1094-1098.

⁸ Clayer J, Bookless-Pratz C, Harris R. Some Health Consequences of natural disaster. MJA 1985;143(5):182-184.

⁹ Selvey L, Sheridan J. The Health Benefits of Mitigating Global Warming in Australia. Sydney: Climate Action Network Australia, 2002.

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