

Climate Change & Health

Preamble

Human pressure on the natural environment is widening and escalating. The extra, more systemic environmental threat to human wellbeing, health and survival has become evident over the past two to three decades – threats from human-induced changes to stratospheric ozone, the climate system, soil fertility and food yields, freshwater supplies, the many ecosystems that maintain the function and vitality of Earth's life-support systems, and the more insidious, pervasive spread of persistent organic chemicals. Meanwhile, other more familiar and more localised hazards have re-emerged as major concerns, including the rising levels of extraction and combustion of fossil fuels especially coal and unconventional gas.

Doctors for the Environment Australia (DEA), seeks to raise awareness of both the general public and, in particular, parliamentarians of the risks to local and global human health – present and future – from environmentally damaging and disruptive technological choices and related short-term economic priorities.

DEA is focussed on human-induced climate change, widely regarded as now the most serious, and growing, worldwide threat to human health and survival and to social stability. This is a topic of utmost urgency, and of great political and cultural complexity. All doctors have an important responsibility to explain both ongoing and newly-emerging environmental risks to public health, and to ensure that health services are equipped to handle for those threats.

Background

Humanity as we know it has evolved under stable climatic conditions. In particular, domesticated food sources, culture, and the subsequent relatively high standard of living since the emergence of agriculture that many in the high-income parts of the world now enjoy has developed within the usual prevailing climate over many millennia. Our health and wellbeing had thrived under what seems now to be a benign global climatic system, as indicated by increases in life expectancy and in total human numbers - now over seven billion.

Climate change

Climate change is occurring and it is anthropogenic or man-made. It is part of the broader 'anthropocene' syndrome of largely human-induced global environmental changes which includes depletion of stratospheric ozone, loss of soil fertility and biodiversity, global nitrogen and phosphorous cycle disruption and ocean acidification.

Climate change is caused by an increase in greenhouse gas production due to fossil fuel emissions from power generation, and transport, mining and agricultural sectors. Greenhouse gases, pre-eminently carbon dioxide, along with methane, nitrous oxide and water vapour with carbon dioxide the major contributor to climate change. These gases increase the heat-trapping capacity of the lower atmosphere and, combined with the diminished capacity of land and

marine environments to absorb and retain extra carbon dioxide (the major greenhouse gas), result in global warming. Deforestation and land degradation through agriculture and pests have destroyed valuable 'carbon sinks'. This destruction has further reduced the ability of natural ecosystems to absorb the increased greenhouse gases to maintain balance.

Global greenhouse gas emissions have increased annually over the past decade and the 0.7°C rise in global temperature experienced since 1950 has caused an increase in frequency of severe weather events, global sea level rise, and sea ice loss in the Arctic. We are on track for a rise in global temperature of 1-2°C by 2050 and 3-4°C by 2100. Rises in temperature will be greater in the Arctic, possibly up to 7°C. Temperature rises of 4°C or more have not been experienced for 10-20 million years and the upper ranges are most likely not compatible with human habitation.

Global health threat

Climate change is the greatest threat to human health this century with destabilisation of our climate having both indirect and direct health impacts. There is a complex interaction between climate change and the many natural systems on earth upon which our health depends. In addition to this, cultural and social factors interact with natural system disruption leading to varied and often unexpected health effects.

Extreme weather events: Extreme weather events like heat waves, bush fires, floods, storms and temperature-enhanced levels of urban air pollution have direct impacts on health. For example, drowning, burns, trauma due to flying and falling debris, dehydration and exacerbation of cardiac and respiratory conditions.

Environmental changes cause health effects: Indirect health impacts are those resulting from changes in ecologically-based systems and include lowered food yields, reduced access to clean water, vector-borne diseases and other infectious diseases due to displaced populations living in unhygienic conditions. Conflict resulting from large numbers of environmental refugees and mental health impacts from those affected by extreme weather events or those living in failing rural communities are also categorised as indirect health effects.

Diseases: Health impacts occur globally and include extensions in the geographic range of several vector-borne diseases; eg. tick-borne encephalitis in Sweden, the tick vector of Lyme disease in eastern Canada and malaria in the western Kenyan highlands.

Health impacts in Australia

Health impacts of severe weather events have been noted in Australia over the past decade particularly and include an increase in the number of emergency calls, hospitalisations and deaths associated with heat waves.

Heat is the leading cause of weather-related deaths in Australia and is the 'silent' killer. This is because what is noted on the death certificate is not 'heatwave' but rather acute renal failure, heart attack or dehydration due to stress experienced by the body during times of extreme heat. During the heatwave in Melbourne in February 2009 there were 374 excess deaths - the elderly, the poor and those with pre-existing medical conditions are especially vulnerable in such events.

Prolonged exposure to heat can also impair judgement and behaviour which increases the risks of accidents and behavioural problems. For example, in South Australia, admissions for mental, behavioural and cognitive disorders have been found to increase by around seven per cent during heat waves.

Increased health impacts from a rise in the number and/or severity of bushfires have also been noted in Australia. Impacts include injury or death from trauma, respiratory hazard and mental health disorders like post-traumatic stress disorder.

Probable current health impacts which have not yet been clearly identified as due to climate change include those related to a rise in food-borne diarrhoeal disease (eg. salmonella infection,

which is very temperature sensitive); those related to an alteration in air quality (eg. particulate matter, ozone formation and aeroallergens causing asthma and respiratory irritation); mental health impacts like depression in drought stricken rural areas and thermal stress in some outdoor workers.

Predicted future health impacts include all of the above plus those resulting from other extreme weather events like floods, storms and cyclones which often damage water supplies, sewerage and electricity. Gastroenteritis outbreaks often occur with consequent impaired food hygiene and there are often difficulties accessing medical care in a timely fashion. Displacement of populations causes adverse social and mental health outcomes in association with property loss and grief.

Mosquito-borne infections like Dengue, Ross River virus and Barmah Forest virus are expected to undergo changes in their geographic and seasonal ranges as temperatures warm and vector habitat expands.

With prolonged drought in some regions there is expected to be reduced food yields, poor hygiene and loss of recreational opportunity leading to stress and unhappiness.

Disruption from severe weather events coupled with reduced food yields both here and overseas is likely to lead to an increase in food costs making healthy food less accessible for those on low incomes particularly those in regional centres or remote communities.

Our psychological health is likely to be impacted by climate change in many different ways. As mentioned above, extreme weather events, prolonged droughts and associated trauma, social dislocation and bereavement can cause depression, anxiety and post-traumatic stress disorders. For many people, the anticipation of climate change and worry about what it means and how it threatens personal futures is a source of distress- this is especially true for young people and those working to raise the necessary awareness to generate action on climate change.

Policy

Action on climate change

Action on climate change has two components, mitigation and adaptation. Some measures will incorporate both mitigation and adaptation but mitigation should be our priority for policy action and financial investment.

Mitigation: Mitigation is action to decrease the level of greenhouse gases released into our atmosphere. It is important to understand that current CO₂ levels of 400ppm are too high and a much safer level for humanity is 300ppm – therefore we need to reduce and/or draw down this excess CO₂.

The first priority is to move to renewable, non-polluting forms of energy production like solar (solar thermal, solar photovoltaic); wind; geothermal; wave; tidal and biomass. This will require a supported transition for workers currently employed in the fossil fuel industries like coal and unconventional gas into other industries. Fortunately, there are many more jobs per kilowatt hour in renewable energy power plants than in coal-fired power plants and these jobs do not have the associated risks of exposure to pollutants via inhalation of diesel and other fumes.

Mitigation or abatement also includes improving energy efficiency - doing more with less - and transforming our energy grid to make it 'smart'. For further information on transitioning to low emission power sources see The Zero Carbon Australia Stationary Energy Plan at; www.bze.org.au/zero-carbon-australia/stationary-energy-plan

Mitigation also involves making transformative changes to the way in which we live. Moving to active forms of transport such as cycling, walking and public transport is an important part of a mitigation effort as the greenhouse gas emissions of vehicles are significant. It is also necessary

to greatly reduce the amount of air travel we take because aviation gas is a significant contributor to greenhouse gas pollution.

Mitigation involves dietary changes too with a move towards eating less red meat and dairy produce and more vegetables. This is not only because the livestock is particularly energy-intensive but because methane, produced by cows and sheep, is a potent greenhouse gas and large scale agriculture is an enormous consumer of fossil fuels with the use of fertilisers, road transport and soil degradation. Changing our agricultural sector to enhance rather than degrade soils, rehabilitate waterways and improve adjacent biodiversity will also act to mitigate climate change.

Protecting and enhancing forests and other biodiverse, carbon dense ecosystems is an important way of keeping carbon in soils and so a move away from clear fell native and old-growth forests is essential. Globally more greenhouse gases are released from deforestation than from all forms of transport together.

Addressing population growth is an important part of mitigation. A key component of this involves education and reproductive rights for all women, which will not only slow population growth but have positive health benefits with greater birth spacing and associated social advantages. With current fertility rates of 1.9 per woman, if annual (non-refugee) immigration numbers are capped at around 70,000, our population will stabilise at around 30 million within two decades.

It is important to note the health benefits of these mitigation actions, which include improving air, water and soil quality, reducing preventable diseases due to inactivity and obesity like heart disease, stroke, certain cancers and mental illness. These health benefits have been called 'health co-benefits' and are important not only for their public health advantages but also for the monetary savings to government health budgets. Critically, moving away from coal fired power generation will cut the adverse health consequences associated with its combustion. These health costs are referred to as 'externalities' and are discussed at length in *How coal burns Australia*⁶.

Adaptation: Adaptation is the process by which we try to cope with the unavoidable impacts of climate change. Adaptation includes insulating schools, hospitals and homes to enable us to cope better with extreme weather events. The development of early warning systems and protocols for health and emergency services to cope with these events will require collaboration between different government departments, research and health groups. The health sector should also be collaborating with other sectors to ensure that long-term adaptation is part of the strategy. For example, it will take several decades to climate-proof our cities.

Adaptation capacities and methods will vary amongst different populations. People already disadvantaged will have greater difficulty adapting than well resourced, more affluent groups. It is crucial that diverse modes of adaptation strategies are used so that vulnerable subgroups are protected. For example, those likely to be affected by heat include low-income families with uninsulated housing, certain occupational groups, the elderly, frail and chronically ill and remote indigenous communities- each of these groups require a specific strategy of engagement, education and action.

Summary

Climate change is a complex problem which threatens our health. It is impacting health locally and globally in concert with multiple inter-related factors and it is crucial that all doctors, policy makers and communities act to address this potentially overwhelming issue.

Doctors for the Environment Australia seeks to combat climate change, working to promote a move from fossil fuels to renewable energy generation as a first order priority, hence our focus on the coal and unconventional gas industries. DEA is also concerned with the protection of carbon sinks like forests and other ecosystems, promoting more sustainable healthcare provision and preventative health action. Spanning all these strategies are our determined efforts to inform our peers, politicians, business and the media of the absolute interconnection between our health and our environment and the reframing of the climate change discourse to emphasise human impacts, especially the health issue.

References

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