

Erratum

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Page 112 – *Chronic disease and climate change: understanding co-benefits and their policy implications* (N S W Public Health Bull 2010; 21(5–6): 109–13).

The editorial by Capon and Rissel stated that the cost of congestion in Australia was estimated at \$64 million. However, this amount is the savings in the cost of congestion due to cycling.¹ The total cost of congestion was \$9.4 billion in 2005, and is expected to rise to \$20.4 billion by 2020.²

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NSW PUBLIC HEALTH BULLETIN

Chronic disease and climate change

Chronic disease and climate change:
understanding co-benefits and
their policy implications

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Abstract: Chronic disease and climate change are major public policy challenges facing governments around the world. An improved understanding of the relationship between chronic disease and climate change should enable improved policy formulation to support both human health and the health of the planet. Chronic disease and climate change are both unintended consequences of our way of life, and are attributable in part to the ready availability of inexpensive fossil fuel energy. There are co-benefits for health from actions to address climate change. For example, substituting physical activity and a vegetable-rich diet for motor vehicle transport and a meat-rich diet is both good for health and good for the planet. We should encourage ways of living that use less carbon as these can be healthy ways of living, for both individuals and society. Quantitative modelling of co-benefits should inform policy responses.

Chronic diseases are by far the leading cause of death in the world and their impact is steadily growing.¹ Australia is no exception.² Despite a currently increasing life expectancy,

our country is in the grip of an epidemic of chronic disease; for example during 2006 obesity overtook tobacco smoking as the leading risk factor for disease burden in Western Australia.³ We can anticipate similar transitions in all Australian States. The interplay between physical and mental health, and the links between chronic disease and depression, warrant integrated approaches to the prevention of physical and mental health problems.

At the same time, Australia's per capita greenhouse gas emissions are the highest of any OECD (Organisation for Economic Co-operation and Development) country and among the highest in the world.⁴ Greenhouse gas emissions contribute to climate change which effects health in a number of ways.^{5,6} Climate change was recently described in the *Lancet* as the biggest global health threat of the 21st century.⁷

Chronic disease and climate change both demand strong public policy responses. The case for aligning policy responses to climate change and public health was cogently argued in the recent series of papers in the *Lancet* on health and climate change.⁸ The authors reported research on the ancillary health effects of policies to reduce greenhouse gas emissions in the transport, food, housing and energy sectors. This special issue of the *Bulletin* presents some Australian perspectives on the co-benefits for health from action to mitigate climate change in association with the Australian

Academy of Science's 2010 Fenner Conference on the Environment which addressed this theme (see abstract of keynote address on page 114).

The concept of co-benefits

A co-benefit is an additional benefit arising from an action that is undertaken for a different principal purpose.⁹ Putative co-benefits from action on climate change (i.e. additional benefits beyond greenhouse gas reductions) include reduced air pollution, increased levels of physical activity, a healthier diet, improved energy security through a more diverse energy supply and less dependency on oil, a reduction in traffic congestion, and new employment opportunities. In other sectors, this approach to co-benefits is sometimes referred to as a 'no-regrets approach' because, even in the absence of a need to act on climate change, there are already strong arguments for many of the proposed actions.

Figure 1 is a diagrammatic representation of the concept of co-benefits for health. Decisions made by individuals, governments and industry have potential direct human health impacts (1) via pathways including nutrition and level of physical activity, and indirect human health impacts (2) via the health of ecosystems (e.g. climate change). It follows that there can be co-benefits for health from actions to address climate change. For clarity, the arrows

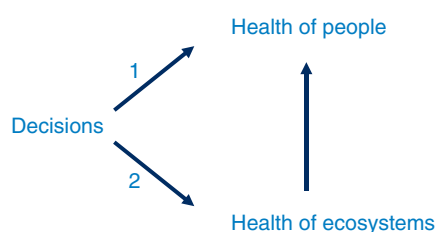


Figure 1. The 'biosensitivity' triangle to illustrate the concept of co-benefits.

are presented as uni-directional, however there are relationships in both directions.¹⁰

Understanding current human situations

There is value in understanding epidemics of chronic disease from an evolutionary perspective. Human beings are now living in very different ways than our hunter-gatherer ancestors did. The evolutionary health principle postulates that if an animal's environment changes in a significant way, then it is likely that the animal will be less well adapted to the new conditions and will consequently show signs of physiological or behavioural maladjustment.¹¹ From an evolutionary perspective, chronic disease can be seen to substantially arise from human maladaptation to the current ready availability of fossil fuel energy (Box 1). Further information about this perspective has been presented in two special issues of the *NSW Public Health Bulletin on Cities, Sustainability and Health* in 2007 (Vol. 18 Issue 3–4 and Issue 11–12) (available at: <http://www.publish.csiro.au/issue/4094.htm>).

The papers in this issue

The papers in this issue of the *Bulletin* build on the *Lancet's* Health and Climate Change Series¹² and present Australian perspectives on co-benefits for health from action on climate change. Giles-Corti and colleagues explore the theme of urban land transport addressed by Woodcock et al.¹³ This paper considers the co-benefits of investing in active transportation, with a focus on policy options to optimise societal objectives aimed at creating healthy, socially and environmentally sustainable communities.

Friel, consistent with the *Lancet* article on food and agriculture,¹⁴ describes the relationship between food security, chronic disease and climate change. She demonstrates how a key climate change mitigation policy – the reduction of greenhouse gas emissions from the agriculture sector

Box 1. From coal mines and oil wells to waistlines, via motors

During the second half of the 20th century, the ready availability of fossil fuel energy enabled sedentary ways of working, moving and recreating. Most Australians now use labour-saving devices on a daily basis. We use washing machines, vacuum cleaners and dishwashers in the home, and motor lawn mowers and leaf blowers in the garden. Power-assisted tools make the workplace easier. We use escalators, lifts and movable walkways to propel ourselves around buildings, and motor vehicles to move around cities and towns. Increasingly, our children choose video games over active recreation.

At the same time, we live in an era in which food is readily available and relatively cheap (especially, energy dense foods). Our food supply is highly dependent on fossil fuels for fertilisers, transport and other inputs.

As individuals, our fat stores arise from an energy imbalance – too much energy in, and too little energy out. If we think about obesity from an energy system perspective, the combination of sedentary ways of living and food intake in excess of need has been enabled by the ready availability of fossil fuel energy in recent years. Therefore obesity can be seen as a 'carbon store' on our waistlines which was originally sourced from coal mines and oil wells.

Is this a sustainable way of living?

through a reduction in consumption of animal source foods – can improve food security and reduce the levels of cardiovascular diseases and some cancers.

Dennekamp and Carey describe the increasing evidence that air pollution contributes to an unacceptable burden of chronic disease and premature mortality, particularly from cardiovascular and respiratory causes. They argue that the action now required to mitigate climate change also has the potential co-benefit of improving air quality and reducing the incidence of chronic disease. Unsurprisingly, they highlight fossil fuel combustion, primarily from motor

vehicles and energy generation, as being at the heart of both climate and health-related problems.¹⁵

Berry and colleagues, taking a focus on Aboriginal well-being and its strong relation to connectedness to traditional country, argue that public health policy must build on Aboriginal people's determination to care for country, traditional knowledge, formidable resilience and self-determination. They posit that Aboriginal-initiated natural resource management directed at climate change adaption supports caring for land and country with mental health, social and emotional wellbeing co-benefits.

Box 2. Active travel – a Win-Win-Win

Active travel is a good example of a 'Win-Win-Win' because active travel is good for health, good for the environment, and good for the hip-pocket. First, physical activity is essential to maintain and improve health. One of the most sustainable ways to build physical activity into your daily routine is to use active forms of travel (walking, cycling, or public transport) to places you need or want to go to, such as work, study, entertainment.¹⁸ Replacing a sedentary motor vehicle trip with walking, cycling, or public transport (which usually involves some walking at either end) increases your activity levels. Second, not using private motor vehicles for even some trips, means less pollution and greenhouse gas emissions, which is also good for the environment. Third, active travel is less costly than owning and driving a motor vehicle when costs of purchase, insurance, registration, maintenance and running a motor vehicle are all taken into account.

Glossary of terms used in this issue

Adaptation* Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. Various types of adaptation exist, for example, anticipatory and reactive, private and public and autonomous and planned. Examples include heat wave early warning systems and growing more vegetation in cities to reduce the urban heat island.

Airshed** A body of air bounded by topography and meteorology in which a substance, once emitted, is contained. It is the geographical boundary for air quality standards.

Chronic disease A term applied to a diverse group of diseases such as heart disease, cancer and arthritis, which tend to be long lasting and persistent in their symptoms or development. Although these features also apply to some communicable diseases, the term is usually confined to non-communicable diseases.

Co-benefits* The benefits of policies implemented for various reasons at the same time, acknowledging that most policies designed to address greenhouse gas mitigation have other, often at least equally important, rationales (e.g. related to objectives of development, sustainability, equity and health).

Greenhouse gas* Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds. This property causes the greenhouse effect. Water vapour (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃) are the primary greenhouse gases in the Earth's atmosphere.

Mitigation* Technological change and substitution that reduce resource inputs and emissions per unit of output. Although several social, economic and technological policies would produce an emission reduction, with respect to climate change, mitigation means implementing policies to reduce greenhouse gas emissions and enhance sinks.

Trip chaining involves planning ahead and using one journey to achieve a number of objectives. For example, a public transport trip may be preceded or followed by a walking and/or cycling trip, either simply to get to or from the public transport stop, or to achieve another objective such as stopping at the newsagent to collect a newspaper to read on the bus.

*Core Writing Team. Pachauri RK, Reisinger A, editors. Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva: IPCC; 2007.

**National Environment Protection Council (NEPC) definition at: http://www.ephc.gov.au/sites/default/files/AAQ_IssScoPpr_AAQ_Review_Draft_200510.pdf

Thompson, Whitehead and Capon describe a new research and workforce development program focused on health and the built environment, recently established in the Faculty of the Built Environment at The University of NSW, with funding from the NSW Department of Health. The NSW Healthy Built Environments Program will foster cross-disciplinary research, deliver education and workforce development, and advocate for health as a primary consideration in built environment decision making. This program will employ an understanding of the co-benefits for health from action on climate change in the framing of research projects, education and advocacy.

Implications for policy and practice

There is increasing recognition that strategies to mitigate climate change can have substantial benefits for both health and climate protection, and that these mitigation strategies are both cost-effective and socially attractive.¹⁶ A Win-Win-Win approach (Box 2), based on the concepts of the triple bottom line,¹⁷ and also known as ‘people, planet, profit’ or ‘the three pillars’, captures an expanded spectrum of values and criteria for measuring organisational (and societal) success – economic, ecological and social.

Some climate change strategies may look appealing, but are not the whole solution. An example is electric cars. While electric cars do not directly produce emissions, drivers are still sedentary and don’t have the health advantages of active travel. Further, if vehicles remain the same size, and take up the same amount of space, then it will make no difference to traffic congestion problems (which are estimated to cost Australia \$64 million a year). If, as is likely, the electricity used in electric cars comes from coal-fired power plants, then the net effect on greenhouse gas emissions may be negative. Increasing active urban travel, and discouraging private motor vehicle use, will provide larger health benefits than policies focusing on lower emission motor vehicles.¹³

An understanding of co-benefits for health from action on climate change should inform policy responses to both chronic disease and climate change. Quantitative modelling of these co-benefits from an Australian perspective, including economic modelling, should be an urgent priority, preferably in advance of national decision making about carbon regulation. An understanding of co-benefits could assist prioritisation of policy interventions in the health sector and other relevant sectors (e.g. transport, energy, agriculture). Potential for unintended consequences for health, and health equity, should be carefully weighed.

An understanding of co-benefits may also have direct implications for clinical practice. For example, a diabetes education consultation for a patient with early diabetes

could include information about building active forms of travel into daily life. To be effective, this will require health workers to work with other sectors (e.g. urban and transport planning) to reduce barriers to healthy ways of living.

The take home message about co-benefits is that low carbon ways of living are healthy ways of living. Health workers and health systems should promote this positive message.

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