

# Towards a Green Public Health

Kai Lit Phua<sup>1</sup> and Simon Barraclough<sup>2</sup>

<sup>1</sup>*Tan Sri Jeffrey Cheah School of Medicine, Monash University (Sunway Campus), Malaysia,*  
& <sup>2</sup>*School of Public Health, La Trobe University, Victoria*

*Public health activities are designed to promote health and reduce morbidity, disability and mortality. However, there is always the possibility that some public health activities may also have a negative impact on the environment. The concept of 'greening' of public health can be used to help to reduce this negative impact on the environment. In line with the philosophy of the rest of the Green Movement, green public health should not only be environmentally friendly but also socially responsible and help to promote social justice, including environmental justice.*

**Key words:** *Green Public Health; Environmentally Friendly; Socially Responsible; Environmental Justice*

Public health activities are intended to promote health and reduce morbidity, disability and mortality. Those professionally engaged in public health have an ethical obligation not to engage consciously in avoidable activities which are harmful to health and should also be role models for healthy living. Although many public health interventions focus upon particular risk, disease and disability risk factors, the wider context for public health activities includes the environment. However, there is always the possibility that certain public health activities might have a negative impact on the environment through the production of non-biodegradable waste, chemical contamination, and the generation of carbon emissions. Some of these negative side effects have been known for decades. Examples of these negative side effects include DDT used for mosquito control in anti-malaria campaigns and which cause collateral damage to the environment. And disposable syringes and needles used in vaccination, which, in six West African countries, produced almost 300 metric tons of waste (World Health Organization 2004; 2007).

The concept of 'greening' of public health can be used to help to reduce negative impacts on the environment, where it is possible to do this without unacceptable risks to human life and health. Thus, DDT use can be reduced through substituting or complementing its use with biological controls such as larvae-eating fish, window screens and pesticide-impregnated bed nets. Orally-administered vaccines (such as oral polio vaccine) will eliminate the problem of the disposal of vaccination equipment.

Green public health is not a new idea. For some years various professional groups have sought to raise consciousness about the environmental consequences of their work. For example, in Australia the New South Wales Nurses' Association has a longstanding policy on Nursing and the Environment, which recognizes that "environmentally sustainable production, techniques and work practices are central to the long term viability of Australian ecology, economy and industries" and calls for the development of better environmental practice in all health facilities (New South Wales Nurses' Association 2007). In Victoria, Australia,

Nursing the Environment, a group within the Australian Nursing Federation, has been promulgating advice on reducing health care and office waste for a number of years (Nursing the Environment 2004).

### **‘Green Public Health’ Should Be Environmentally Friendly**

One of the greatest challenges of the early twenty-first century is anthropogenic environmental deterioration in its various manifestations (Landon 2006). These include the following:

- Pollution of the environment
- Non-sustainable use of renewable natural resources and depletion of non-renewable natural resources
- Loss of biodiversity and habitat
- Ozone depletion
- Adverse climate change.

Concern for these phenomena should be involved in formulating and implementing public health policies and programs. Those concerned with managing public health programs should consciously and systematically consider the environmental consequence of their activities. Thus, public health programs should avoid aggravating environmental deterioration and aim to reduce the size of their ‘environmental footprint’.

#### **Pollution of the environment**

‘Environmental pollution’ can include such damaging phenomena as air and water pollution, the generation of solid and hazardous waste (including e-waste), excessive noise, ‘heat islands’ and acid precipitation.

While environmental health programs seek to combat these different forms of pollution, certain public health activities may have a negative impact on the

environment. It is important, therefore, that public health processes, products and services should have smaller environmental footprints, wherever applicable, during manufacturing, storage, distribution, and disposal. During production, lesser amounts of raw materials should be used whenever possible. Efforts should be made to eliminate or decrease the environmental impact of chemicals, materials, and wastes generated to manufacture public health products or public health services. Public health products and services should also be generated in an efficient way, that is, technical efficiency (in the economic sense) should be maximised. For example, heat-stable vaccines do not require an energy-consuming cold chain (Hipgrave et al. 2006). Environmental costs of distribution can be reduced with miniaturisation as smaller or lighter weight equipment requires less energy to transport. As for disposal, biodegradable materials reduce the problem of solid waste disposal. Preference in purchasing goods should be given to suppliers able to demonstrate that they have reduced negative environmental consequences in producing and distributing their products.

#### **Non-sustainable use of renewable natural resources and depletion of non-renewable natural resources**

Public health processes, products and services should also be greener in their use of natural resources. Renewable resources should be used in a sustainable way, while there should be reduced use of non-renewables.

Green measures relating to natural resources include:

- Using less material to manufacture the product or provide the service
- Reducing packaging
- Using recycled or recyclable material whenever possible

- Energy-saving technologies
- Using greener alternative energy sources, such as solar, wind power and geothermal power
- Using appropriate technology and locally-available materials, rather than importing them from distant places (Briceno-Leon 2001; Sulabh 2001).

### **Loss of biodiversity and habitat**

Loss of biodiversity, partly as a result of deforestation and desertification, is the reduction in the number of animal and plant species as a result of habitat destruction and related activities by humans. Pesticides used in spraying or fogging campaigns should not be 'broad spectrum', which kill biological organisms indiscriminately. Similarly, habitat modifications for public health objectives, such as the draining of swamps to prevent the breeding of mosquitoes, should not be carried out if other less environmentally-damaging methods are feasible. For example, in order to eradicate *dracunculiasis* (Guinea worm disease), 'communal filtration units' made from metal oil drums with fine-meshed cloth filters to remove *Cyclops* vectors from water meant for human consumption can be used instead of chemicals that kill *Cyclops* as well as other micro-organisms in pond water (Aikhomu et al. 2000). Measures to control vermin and feral animals need to take into account the risks of poisoning or trapping other animals, including those which might be endangered species.

### **Ozone depletion**

The depletion of ozone in the upper atmosphere has been traced to chlorofluorocarbons (CFCs) released into the air because of human economic activity. Ozone depletion increases the

amount of ultraviolet radiation reaching the earth's surface and is, therefore, a health hazard. The processes involved in the manufacturing of public health and medical devices and drugs should be improved so that CFCs are produced in smaller quantities or eliminated altogether.

### **Adverse climate change**

Adverse climate change induced by greenhouse gases, such as carbon dioxide and methane, is indicated by phenomena such as rising average land temperature, rising ocean surface temperature, adverse changes in rainfall patterns, melting of glaciers and permafrost, sea level rise, and acidification of the oceans (Global Health Watch 2005; Intergovernmental Panel on Climate Change 2008). Active and urgent steps are needed to reduce the volume of greenhouse gases created by public health activities.

Cyber public health, using computers and the Internet, should be used more extensively if it can help to reduce the size of the public health carbon footprint. For example, 'Second Life', a website in which participants can create a 'virtual world', can also be used for national and international virtual public health conferences (MacLeod 2008). Such virtual conferences allow for plenary gatherings, workshops, question-and-answer sessions and breakout meetings. This would mean that conference attendees would not need to travel physically by jet plane to the location of the conference in order to be an active participant. Thus, the carbon footprint generated by air and ground travel would be reduced. Such conferences, would, however, face the problem of differing time zones.

When conferences are held there needs to be a greater awareness of their carbon footprint. Costly and heavy printed promotional materials could be replaced

with computer disks or with a single sheet listing a Web address for viewing the material. Delegates could be encouraged to purchase carbon offsets for their travel. Only hotels able to demonstrate environmentally-friendly policies would receive official endorsement. Caterers would be expected to minimise plastic waste.

Organisational policies and practices need to reflect an awareness of their environmental consequences. Travel allowances should not encourage unnecessary private automobile usage or pay higher rates for larger engine capacity.

Unless there are demonstrable health risks with tap water, organisations should provide drinking fountains or water dispensers and not sanction the sale of bottled water. Used plastic bottles contribute to pollution and are manufactured from fossil fuel; and bottled water has been associated with rising levels of dental caries in fluoridated areas and involves significant carbon emissions in its transportation. Indeed, some agencies have prohibited bottled water on their premises to demonstrate both substantially and symbolically their concerns about its environmental harm.

At the office level, action can be taken to reduce negative environmental impacts by devising simpler administrative procedures involving large quantities of paper and the transport of such documents. More effective planning and timetabling can reduce carbon emissions by reducing the number of meetings. Courses can be taught in day blocks instead of in shorter periods thereby reducing the amount of travel by participants.

### **'Green Public Health' Should Be Socially Responsible**

Some public health experts have argued that in order to improve the health of populations, it is necessary to move beyond the individualistic, behavioral change focus of activities such as public

health campaigns to promote a 'healthy lifestyle'. It is necessary to pay more attention to 'upstream' factors such as the socioeconomic structure of a particular society and the impact of social injustice on health (Levy & Sidel 2006).

Following this logic, and in line with the philosophy of the rest of the Green Movement, green public health should not only be environmentally friendly but also socially responsible and help to promote social justice. In other words, green public health practitioners should also be advocates for social justice. They should work actively to promote social justice, that is, human rights and social welfare; to promote distributive justice, that is, better distribution of wealth, assets, privileges, and advantages; and also to create equality of opportunity and greater participation of citizens. One aspect of social justice is environmental justice. Environmental justice is lacking where there is 'environmental racism', for example, dumping hazardous wastes on unsuspecting ethnic minority neighborhoods (Bullard 2000). Environmental justice is also lacking if hazardous substances, especially banned substances, and hazardous wastes are produced in wealthy countries and then exported or dumped on less wealthy developing nations (International Herald Tribune 2008).

Advocacy work by public health practitioners may be controversial in the eyes of some people. This applies especially to campaigns for restrictions on international trade in health-damaging substances such as tobacco and advocacy for better distribution of income and wealth within and between nations.

Public health research that deals with the negative impact of human-induced environmental changes on health would also be an important contribution to the development of a socially-responsible green public health. Examples of such

research include the relationship between dam building and diseases such as *schistosomiasis* in Africa (Oladejo & Ofoezie 2006), and deforestation, with the movement of bats and the spread of Nipah virus to pigs and humans in Malaysia (Chua et al. 2002).

While recognising some of the lessons for health promotion that might be learnt from the corporate sector, care must be taken by those working in public health not to replicate marketing devices that have negative environmental consequences. In some countries, large sums are spent on promotional items and expensive printed materials with the aim of delivering health messages. In Malaysia, for example, various items, such as sunshades for car windscreens, watches and metal badges, were purchased and transported from factories in China to be distributed as part of an HIV prevention campaign. At a recent world conference the World Health Organization stall offered packets of coloured pens to promote the *MPOWER* campaign on tobacco control. These had to be carried from Geneva to Asia and then carried back home to various countries by those receiving them. The distribution at conferences of computer discs in place of heavy printed material is a practical

way of reducing energy used in printing and transport as well as saving on paper production.

## Conclusion

At both the individual and institutional levels, greater efforts are needed to work towards a green public health. Consciousness about the green agenda should be raised among everyone working in public health. Personal and institutional environmental ethics should be included in all public health university and school courses. The recognition of environmental impacts should be a mandatory element of every public health policy development process. A 'green audit' should be included as a matter of course in the management activities of public health bodies.

It is encouraging to see that the Director of the Pan American Health Organization (PAHO), Mirta Roses-Periago used the occasion of the 2008 World Health Day, with its theme 'Protecting health from climate change', to launch the 'Green PAHO' plan for a 'green' working environment as part of her commitment to a 'healthy organization' (Roses-Periago 2008). Other health agencies would do well to emulate this example.

## References

- Aikhomu S.E., Brieger, W.R. & Kale, O.O. 2000, 'Acceptance and use of communal filtration units in guinea worm eradication', *Tropical Medicine & International Health*, vol. 5, no. 1, pp. 47-52.
- Briceno-Leon, R. 2001, 'Mud, bugs and community participation: Remodeling village houses to eradicate vector-borne disease', in *Applying Health Social Science: Best Practice in the Developing World*, eds N. Higginbotham, R. Briceno-Leon & N. Johnson, London.
- Bullard, R.D. 2000, *Dumping in Dixie: Race, Class and Environmental Quality*, 3rd edn, Westview Press, Boulder, Colorado.
- Chua, K.B., Chua, B.H. & Wang, C.W. 2002, 'Anthropogenic deforestation, El Nino and the emergence of Nipah virus in Malaysia', *Malaysian Journal of Pathology*, vol. 24, no. 1, pp. 15-21.
- Hipgrave, D.B., Maynard, J.E. & Biggs, B. 2006, 'Improving birth dose coverage of hepatitis B vaccine', *Bulletin of the World Health Organization*, vol. 84, no. 1, pp. 65-71.
- Landon, M. 2006, *Environment, Health and Sustainable Development*, Open University Press, Maidenhead, Berkshire.
- New South Wales Nurses' Association 2007, *Policy on Nursing and the Environment*, Camperdown, NSW.

- Nursing the Environment 2004, *Eco-efficiency in health care*, <<http://cleanerproduction.curtin.edu.au/resources/industry/health/waste-minimisation.pdf>>, 15 June 2009.
- Sulabh, S. 2001, 'Low cost sanitation', in *Good Practices and Innovative Experiences in the South*, Volume 2: Social Policies, Indigenous Knowledge and Appropriate Technology, eds M. Khor & L.L.Lim, Zed Books, London.
- Global Health Watch* 2005-2006, 2005, Zed Books, London.
- Intergovernmental Panel on Climate Change 2008, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Fourth Assessment Report of the IPCC*, Cambridge, University Press, Cambridge.
- International Herald Tribune 2008, *Delegates Fail to Agree on Banning Toxic Waste Exports at UN Conference*. June 27.  
<<http://www.ihf.com/articles/ap/2008/06/27/asia/AS-GEN-Indonesia-Toxic-Trade.php>>, 15 June 2009.
- Levy, B.S, & Sidel, V.W. eds. 2006, *Social Injustice and Public Health*, Oxford University Press, New York.
- MacLeod, D. 2008, 'Second Life: is this the future of the academic conference?' *Mortarboard blog*, *guardian.co.uk*. November 11. <<http://www.guardian.co.uk/education/mortarboard/2008/nov/11/highereducation-secondlife>>, 15 June 2009.
- Mira, Roses-Periago 2008, Speech on World Health Day 2008, [http://paho.org/English/D/Speech\\_WHD2008\\_eng.htm](http://paho.org/English/D/Speech_WHD2008_eng.htm)>, 4 May 2009.
- Oladejo, S.O. & Ofoezie, I.E. 2006, 'Unabated *schistosomiasis* transmission in Erinle River Dam, Osun State, Nigeria: Evidence of neglect of environmental effects of development projects', *Tropical Medicine & International Health*, vol. 11, no. 6, pp. 843-50.
- World Health Organization 2004, Health-Care Waste Management, <<http://www.who.int/mediacentre/factsheets/fs281/en/index.html>>, 12 May 2009.
- World Health Organization 2007, *The Use of DDT in Malaria Vector Control*, World Health Organization, Geneva.

Correspondence to:

Phua Kai Lit  
Tan Sri Jeffrey Cheah School of Medicine  
Monash University (Sunway Campus)  
Jalan Lagoon Selatan  
46150 Bandar Sunway  
Selangor  
MALAYSIA  
Email: [phuakl@hotmail.com](mailto:phuakl@hotmail.com)

[Back to TOC](#)