



Alan Abelsohn MBChB, CCFP, FCFP
alan.abelsohn@utoronto.ca

37 – Environment and Health in Family Medicine

Alan Abelsohn MBChB, CCFP, FCFP
Associate Professor, Department of Family and Community Medicine and the Dalla Lana School of Public Health, University of Toronto.

How is the environment that my patient lives in, affecting her health? It is an interesting question, and one most family doctors seldom consider. I will discuss this question from a number of perspectives.

Is it important, i.e. how big is the burden on health as a result of environmental factors? There have been a number of estimates of the burden of environmental impacts on health, noting that these impacts are preventable. However, the scope of the definition of environmental health and the methods used vary from study to study, making interpretation difficult. Table 1 lists a selection of the studies. It is clear that the morbidity and mortality from environmental factors is significant.

Study	Jurisdiction	Scope of Study	Health costs
WHO (1)	Globally	A broad scope of factors, including chemical and biological pollution in air, water and soil, UV and ionizing radiation, noise and electromagnetic fields, occupational risks, climate and ecosystem change and the effects of the built environment.	24% of DALYs (Disability Adjusted Life Years) 23% of all deaths 36% of deaths in children aged 0-14
WHO (1)	Developed countries	As above	16% of DALYs
Boyd (2)	Canada	Restricted to environmental burden of disease from respiratory disease, cardiovascular disease, cancer and congenital affliction	Annually: 10,000–25,000 deaths, 78,000–194,000 hospitalizations, 8000–24,000 new cases of cancer; and 500–2500 low birth weight babies, costing between \$3.6 billion and \$9.1 billion

Developed countries are less affected, as the burden in developing countries includes water contamination, and the large numbers affected by indoor burning of coal and biomass for home heating and cooking, which is responsible for 1.6 million premature deaths and nearly 3% of the global burden of disease in 2000 (3), as well as the suffocating outdoor air pollution of cities like Beijing and Delhi.

So let's consider a case. A 14 year-old girl presents in the emergency department with an exacerbation of her asthma. She had been previously well controlled, on a LABA and Inhaled Corticosteroid combination. What might have precipitated this exacerbation? It could be due to a viral upper respiratory infection, or non-compliance. But to consider possible environmental factors, we suggest taking an "exposure history" using the CHP mnemonic (4). She might be exposed in the following environments. (Table 2)

CHOP	Location	Examples
C	Community	Outdoor air pollution from traffic, industry, wood-smoke from a fire, crop burning or home heating/cooking
H	Home	Second-hand smoke; a new pet; cockroaches; House dust mites; water damage and mould; smoke from wood-burning or kerosene stoves or fireplaces; Outdoor air pollution infiltrating inside
H	Hobbies	Clay dust or glazes from pottery/ceramics; paint fumes; solvents; chemicals; baking flour
O	Occupation/ School	Exposures at work or in the school building
P	Personal	Smoking

So asking, or if a house-call is carried out, observation, might reveal the "upstream" provocative factors, which might otherwise not be recognised. And the treatment would be two-fold: treating the asthma exacerbation medically, but also intervening if possible in the environment. For example, community air pollution was increased that day, and the corresponding Air Quality Index was elevated. The family could be counselled that strenuous outdoor activity increases the intake of air pollutants into the airways, and should be reduced when pollution levels are high; and that she should exercise away from traffic as much as possible, because exercising near traffic increases pollutant exposure and reduces FEV1 (5).

Environmental health is by definition multidisciplinary, and many of these issues might overlap with Public Health, or other disciplines. For example, a 2 year-old child is found to have a high serum lead level. The source (H in the CHOP mnemonic) is hand to mouth activity so that house dust is ingested; and the dust is contaminated by deteriorating old lead-based paint around the windows. Lead was removed from paint in Canada in 1978. The intervention is to remove the child from the environment, and remediate the house dust/paint situation. Other sources of lead might have been from

- (H-Home) children's toys or jewellery, lead-soldered pots or glazed pottery;
- (H-hobbies) stained glass or pottery and
- (P-personal) folk remedies, Ayurvedic products or Asian eye-cosmetics.

But there is another aspect of the environment that, although less immediately clinically relevant, is important to family doctors; namely the health of the planet. Climate change is not just a physical issue; it is very much a health issue. Dr Margaret Chan, director-general of the WHO, called climate change "the defining issue for public health in the 21st century". The broader perspective of planetary sustainability (6) is being discussed more and more urgently in medical circles.

The health effects of climate change are described as direct (heat extremes; severe storms and floods) and indirect, which spans a number of pathways; increased range of vector-borne diseases (Lyme disease in Canada; Chikungunya in Europe and the Caribbean); food insecurity secondary to drought, with resulting malnutrition, water insecurity, and sea level rise which will all lead to the displacement of climate change refugees and the potential for international conflict.

What is the role of family doctors?

We should be checking and taking steps to reduce our own and our family's Carbon footprints:

<http://www.nature.org/greenliving/carboncalculator/> .

In our clinics and hospitals, we should be leading by example, and doing our best to make them ecologically

