

Climate change

Should family physicians and family medicine organizations pay attention?

Alan Abelsohn MB ChB CCFP FCFP Val Rachlis MD CCFP FCFP Cathy Vakil MD CCFP FCFP

In 2007, Val Rachlis, then President of the Ontario College of Family Physicians, challenged organization members in his biweekly communication to consider climate change as a health issue that deserved the attention of Canadian family physicians.¹ Responses to his essay included a report on the health effects of climate change² and a brochure on green solutions in the doctor's office.³ In this commentary, we will attempt to reinforce this challenge to Canadian family physicians. We will describe the health effects of climate change, both within Canada and internationally, and discuss the various roles that family physicians might need to consider playing in the years ahead.

Climate science and global warming

The evidence supporting the changes in global climate is strong, and contrary to what "climate sceptics" assert, it is supported by numerous peer-reviewed articles and reports from respected scientific bodies such as the Intergovernmental Panel on Climate Change,⁴ the US National Oceanic and Atmospheric Association,⁵ and the National Aeronautics and Space Administration Goddard Institute for Space Studies.⁶ **Figure 1**,^{6*} for example, shows the rise in global annual mean surface air temperatures since 1880. The average annual temperature in Canada has increased 1.30°C in the past 50 years. The change is greater at higher latitudes and in winter, such that the average annual temperature in the Arctic winter is projected to increase as much as 3°C to 4°C by 2020, and 5°C to 10°C by 2050.⁷ Associated changes of importance have included alterations to the hydrologic cycle, with a 12% increase in average annual precipitation in Canada in the past 50 years; increased intensity of storms and floods (due to warmer air holding more moisture); more periods of drought in many areas, including in central Canada; globally a rise in sea level; and a substantial loss of global biodiversity.

The Intergovernmental Panel on Climate Change states that the global increase in temperature is "very likely" (>90% probability) owing to increases in the atmospheric concentration of greenhouse gases (GHGs),

which are the result of human activity.⁴ The rate of increase of carbon dioxide emissions has steepened recently (**Figure 2**),^{8*} such that the International Energy Agency⁹ believes we are now on a trajectory to a temperature increase of more than 3.5°C, a scenario that the World Bank describes as "devastating."¹⁰ A 4°C world "would be one of unprecedented heat waves, severe drought, and major floods in many regions, with serious impacts on human systems, ecosystems, and associated services."¹⁰ Canada's total GHG emissions have risen 17% between 1990 and 2010, and in per capita terms, in 2010, we ranked third worst after Australia and the United States among developed countries¹¹ (at 15.2 tonnes of carbon dioxide per capita), with developing countries, including India and China, being well below us (1.6 and 5.8 tonnes of carbon dioxide, respectively).¹² Even if globally we were able to stabilize carbon dioxide atmospheric concentrations now, changes in climate and sea levels would continue for decades, and their attendant health effects would not be avoided because the climate system is slow to respond. Therefore, there are 2 aspects of intervention: adaptation (ie, interventions to reduce the inevitable effects of climate change) and mitigation (ie, the reduction of atmospheric GHGs by reducing emissions or increasing sequestration). Mitigation would be true primary prevention.

Health effects of climate change

Climate change has been described as the "defining issue for public health during this century."¹³ In 2007, Dr Margaret Chan of the World Health Organization said the following:

This century, climate change—a fifth horseman, a new threat of a magnitude unknown to human experience—will ride across our promising landscape of public health. It will ride on a collision course with all the fits and starts of our progress, sometimes fragile, sometimes fundamental.¹³

Direct effects on health include those resulting from severe weather events such as heat waves and intense storms. Indirect effects, in which the cause-effect

***Figures 1 and 2** are available at www.cfp.ca. Go to the full text of the article online, then click on **CFPlus** in the top right-hand side of the page.



This article is eligible for Mainpro-M1 credits.
To earn credits, go to www.cfp.ca and click on the Mainpro link.

This article has been peer reviewed.
Can Fam Physician 2013;59:462-6

Cet article se trouve aussi en français à la page 482.

pathway is more complex, include those that will result from increases in air pollution, increases in allergens, and changes to patterns of water-borne, food-borne, and vector-borne infectious diseases. In developing countries, increased threats to food and water security, as well as the profound effects of sea-level rise, will lead to the displacement of populations, creating climate-change refugees and the potential for resulting international conflicts.^{7,14-16} In Canada, the approximately 150 000 people who live in the North⁷ will be affected severely and uniquely. With thinning Arctic ice, hunting for caribou and other traditional foods will become more dangerous and less successful; this will have dietary, sociocultural, and psychological consequences. There is also a concern about an increase of zoonotic and infectious diseases.^{7,17,18}

These health effects and attempts at adaptation are intertwined with other global problems, such as social determinants of health and health inequalities, population growth, and biodiversity loss.

Global ethical and economic perspectives

The global maldistribution of cause and effect raises ethical concerns. There will be substantial health effects over time within Canada and other developed nations; by the 2080s, deaths related to higher temperatures and poorer air quality attributable to climate change could account for 1% to 2% of the total deaths within Canadian cities.¹⁹ However, by far the larger effects will be in developing countries, whose historical contribution to GHGs has been low.¹⁶ The World Health Organization estimates that climate change now results in 150 000 deaths per year, mostly in these developing countries, owing to climate-sensitive conditions, including malaria, malnutrition, gastroenteritis, water stress, and flooding from intense storms and sea-level rise. Climate change will increase the health differential between rich and poor nations. Moreover, developing countries lack the adaptive capacity, including public health systems, to avoid the health effects of climate change.

There is also a convincing economic argument for mitigation. The financial benefits of strong and early action to reduce GHG emissions far outweigh the economic costs of delaying action.²⁰ Also, there are "health co-benefits" to green strategies such as using green energy to reduce emissions of air pollutants. Active transportation strategies that promote aerobic activity and eating lower on the food chain (which reduces GHG emissions through less meat production, which is carbon intensive) are important in the public health battle against obesity, cardiovascular disease, and diabetes.

Role of family physicians

It is reasonable to reflect on the 4 principles of family medicine²¹ as a way to steer our individual and collective actions in relation to climate change.

Skilled clinicians. What can Canadian family physicians expect to see in their practices? We will see more patients suffering from both direct and indirect effects of climate change (**Table 1**).^{7,17,18,22-25} Although climate change is unlikely to bring new diseases, there will be a change in pattern of existing diseases. For example, there will be more frequent episodes of extreme heat and more air pollution²²; and in Canada, we are already seeing an extension of the geographical range of Lyme disease,²⁴ as warmer temperatures support the survival of the tick vector at higher latitudes.

It is imperative that we educate our present and future family physicians so that they are prepared to deal with a variety of disease manifestations, as the frequency and range of many conditions is increasingly and continually modified by the effects of climate change. Continuing medical education organized by our national and provincial family medicine colleges should be made available to our practising physicians (recent promising examples are 2 online courses in air pollution and extreme heat events^{26,27}), and curriculums in medical schools should incorporate a new emphasis in this area. If climate change becomes the most dominant public health issue of this century,¹³ our preparations as front-line physicians must be paramount and they must begin now.

Community-based discipline. As family physicians, we are able "to respond to people's changing needs, to adapt quickly to changing circumstances, and to mobilize appropriate resources to address patients' needs."²¹ Family physicians are the most trusted source in their communities in environmental health issues.²⁸ As such, we have a responsibility as "community scientists" to become literate ourselves about climate change and its health effects, so that we can translate this science and the required interventions to the communities we serve.

Resource to a defined population. This principle states that "family physicians have the responsibility to advocate public policy that promotes their patients' health."²¹ The CanMEDS-Family Medicine role of health advocate states that family doctors should "responsibly use their expertise and influence to advance the health and well-being of individual patients, communities, and populations."²⁹ Ultimately, climate change is a health issue; adaptation and mitigation are examples of primary preventive medicine, which is unequivocally the role of family physicians. The urgency and importance of climate change offers family doctors an ideal opportunity to participate in the dialogue and action required to address this vital issue. In this, we will also need to collaborate with other health care providers, especially our public health colleagues. We should also be leading by example, such as by incorporating green solutions in our offices and clinics.

Table 1. Health effects of climate change in Canada

ENVIRONMENTAL CHANGE	CLINICAL PRESENTATION	CLINICAL TREATMENT AND PREVENTION	PUBLIC HEALTH INTERVENTIONS
Heat	More cases of heat exhaustion and life-threatening heatstroke	Recognize and treat in office and in ED Counsel high-risk patients, including those at risk owing to their age (eg, children, the elderly); those with chronic diseases (eg, cardiorespiratory conditions, diabetes, CKD, Parkinson disease); those who take medications that impair the body's physiologic adaptation to heat (eg, antihistamines, diuretics, psychiatric medications, anticholinergics); those who display social isolation or live in poor housing conditions (eg, no air conditioning, poor ventilation, top-floor rooms); homeless people; outdoor workers; and those who exercise vigorously ²²	Heat health alert programs ²²
Extreme weather events	Intense rainstorms and floods, causing direct injuries and contamination of water supplies	Treat injuries Treat PTSD Participate in emergency response teams	Infrastructure repair; maintain clean water supplies Emergency response
Increase in air pollution, especially ground-level ozone	Exacerbation of asthma, COPD, and cardiac disease	Treat exacerbations Counsel at-risk patients to reduce exposure by following the AQHI	AQHI program
Air pollution from more frequent forest fires due to drying of the forests and increased damage to forests by the western pine beetle	Forest fires are a direct threat to communities Wood smoke has been shown to lead to increased ED visits for respiratory problems ²³	Treat respiratory cases	Fire alerts AQHI program
Ragweed and other allergenic plants grow faster and produce more pollen with warmer temperatures	Increased incidence of allergic rhinitis	Treat allergic rhinitis	NA
Extension of the range of Lyme disease as warmer temperatures are conducive to survival of the tick vector farther north ²⁴	More cases of Lyme disease	Diagnose and treat primary Lyme disease with doxycycline (typical "target" rash of erythema migrans) Participate in surveillance	Public education programs for safe hiking in the bush and tick recognition and removal Surveillance programs
Increased air and water temperatures improve survival of pathogens; heavy rainfall and flooding facilitate transport of pathogens into drinking water supply	Increased incidence of water-borne and food-borne diseases ¹⁷	Diagnose and treat disease Participate in surveillance	Manage water run-off after heavy precipitation Monitor safety of drinking water
Climate changes provide optimal conditions for fungal spore elaboration and survival	Invasive fungal disease (eg, <i>Cryptococcus gattii</i> in British Columbia ²⁵)	Diagnose and treat disease Participate in surveillance	Surveillance programs
Extension northward of the range of dengue and malaria, in Latin America, the Caribbean, Asia, and Africa, affecting returning travelers (eg, malaria in some Caribbean vacation destinations) ¹⁷	More cases of malaria and dengue in returning travelers	Be aware of these diseases and treat Provide appropriate advice to travelers before departure	Public education for travelers
Social and economic effects in resource-based communities affected by climate change (eg, fishing, farming, and forestry communities)	Increased social and economic distress (owing to unemployment in affected communities)	Manage increased individual and family stress	Increased socioeconomic support
Climate effects in northern communities (eg, ice instability, redistribution and reduced accessibility of wildlife, reduced availability of fresh water) ⁷	Increased accidents, food insecurity, increased water-borne infections, sociocultural disruption due to reduction of traditional or country foods ¹⁸	Recognize diseases Support already-stressed communities	Increased public health support to already-vulnerable communities

AQHI—Air Quality Health Index, CKD—chronic kidney disease, COPD—chronic obstructive pulmonary disease, ED—emergency department, NA—not available, PTSD—posttraumatic stress disorder.

Patient-physician relationship. The fourth and defining principle of family medicine states that the “patient-physician relationship has the qualities of a covenant—a promise, by physicians, to be faithful to their commitment to patients’ well-being.”²¹ In the years ahead, the health of our patients and the care we are able to provide will be dramatically altered by the effects of climate change. It is our ultimate responsibility to act in the best interests of our patients and thus their collective home, our planet, and to become true advocates of health on a global scale, as the CanMEDS–Family Medicine framework states:

Communities and societies need family physicians’ special expertise to identify and collaboratively address broad health issues and the determinants of health Framed in this multi-level way, health advocacy is an essential and fundamental component of health promotion. Health advocacy is appropriately expressed both by the actions of individual family physicians and through collective actions with other health professionals in influencing population health and public policy.²⁹

Role of professional organizations

Medical organizations can also be models for addressing climate change. For example, the College of Family Physicians of Canada showed leadership in 2009 by switching to renewable energy for its offices.


The health care sector in Canada contributes approximately 10% of the gross domestic product and is responsible for 2.1% of GHG emissions.³⁰ Although many hospitals have engaged in sustainable practices, more needs to be done. The Canadian Coalition for Green Health Care³¹ is an organization, supported by a number of hospitals, environmental organizations, and health care associations, that encourages health care institutions to follow more sustainable practices. In the United Kingdom, the National Health Service, whose emissions account for 25% of total public sector emissions and 3.2% of total carbon emissions, has taken considerable steps to reduce its carbon footprint.³² The Climate and Health Council³³ in the United Kingdom supports sustainable initiatives among health professionals in their various roles.

In 2009, before the United Nations Framework Convention on Climate Change in Copenhagen, Denmark, a joint statement on climate change was issued by the College of Family Physicians of Canada, the Canadian Medical Association, and the Royal College of Physicians and Surgeons of Canada.³⁴ This was an unprecedented coalition. We encourage the formation of an ongoing coalition of medical organizations to promote the health “angle” in the need to address climate change in Canada. Nationally we face a huge struggle in reducing GHGs, as the National Roundtable on the Environment and the Economy suggests:

Canada stands at a decision point for achieving its 2020 greenhouse gas reduction target. The analysis demonstrates a large gap between Canada’s emissions trajectory and the federal government’s target of 17 per cent below 2005 levels by 2020. Further, we show that the cost of achieving the Canadian climate policy target is high owing to the short time frame remaining to meet the target, a lack of coordination by governments, and the growing emissions from some economic activities. It is getting harder, not easier, to achieve Canada’s climate policy goals the longer time goes on.³⁵

Internationally and within Canada

Internationally, the outcomes of the 2011 United Nations Framework Convention on Climate Change in Durban, South Africa, were hopeful, in that all countries, including the United States and developing nations such as India and China, agreed to work toward legally binding and transparent carbon dioxide reductions, as well as to establish a fund to address inequity by transferring appropriate capacity and technology from developed to developing nations. However, no immediate action was endorsed. Canada won 6 Fossil of the Day awards (awards distributed by members of the Climate Action Network to countries they believe “block” progress in climate-change negotiations),³⁶ and its role was described as “shameful.”³⁷ A strong health lobby composed of both medical and nongovernmental organizations was present at the Durban meetings, as a health focus became more prominent. In the future, it is hoped that Canadian physicians will be able to join our voices with this emerging movement both in Canada and internationally,³⁸ as Dr Chan stated in a 2007 speech: “The health sector is not in a position to mitigate climate change in a direct and substantial way. But health is in a strong position to give the policy debate some compelling evidence-based arguments.”¹³

Climate change *is* a health issue. As such, it should be our responsibility as family physicians to, individually and collectively, speak in a credible, educated, and united voice to our patients, communities, and government organizations about mitigating and adapting to the effects of climate change. 

Dr Abelsohn is a family physician in Toronto, Ont, and Assistant Professor in the Department of Family and Community Medicine and the Dalla Lana School of Public Health at the University of Toronto. **Dr Rachlis** is a family physician in Toronto and Associate Professor in the Department of Family and Community Medicine at the University of Toronto. **Dr Vakil** is a family physician in Kingston, Ont, and Assistant Professor in the Department of Family Medicine at Queen’s University in Kingston.

Competing interests

None declared

Correspondence

Dr Alan Abelsohn, 1466 Bathurst St, #205, Toronto, ON M5R 3S3; telephone 416 483-8111; e-mail alan.abelsohn@utoronto.ca

The opinions expressed in commentaries are those of the authors. Publication does not imply endorsement by the College of Family Physicians of Canada.

References

- Rachlis V. "Inside out": guest editorial. "Global warming." Toronto, ON: Ontario College of Family Physicians; 2007. Available from: www.ocfp.on.ca/docs/communications/march-19-2007.pdf?Status=Master. Accessed 2013 Mar 8.
- Abelsohn A, Rachlis V, Rosen D, Kasperski MJ. *Addressing the health effects of climate change: family physicians are key*. Toronto, ON: Ontario College of Family Physicians; 2008. Available from: www.ocfp.on.ca/docs/public-policy-documents/addressing-the-health-effects-of-climate-change-family-physicians-are-key.pdf?sfvrsn=3. Accessed 2013 Mar 26.
- Mu L, Arya N. *Green office solutions for physicians. Tips for a healthier, greener office*. Toronto, ON: Ontario College of Family Physicians. Available from: www.ocfp.on.ca/docs/committee-documents/green-office-solutions-for-physicians.pdf?sfvrsn=2. Accessed 2013 Mar 26.
- Solomon S, Qin D, Manning M, Chen Z, Marquis M, Averyt KB, et al, editors. *Climate change 2007. The physical science basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC*. Cambridge, UK: Cambridge University Press; 2007.
- Blunden J, Arndt DS, Baringer MO. State of the climate in 2010. *BAMS* 2011;92(6):S1-S266.
- National Aeronautics and Space Administration Goddard Institute for Space Studies [website]. *GISS surface temperature analysis (GISTEMP)*. Washington, DC: National Aeronautics and Space Administration Goddard Institute for Space Studies; 2013. Available from: <http://data.giss.nasa.gov/gistemp/>. Accessed 2013 Mar 26.
- Séguin J, editor. *Human health in a changing climate: a Canadian assessment of vulnerabilities and adaptive capacity*. Ottawa, ON: Health Canada; 2008. Available from: www.2degreesc.com/Files/CCandHealth.pdf. Accessed 2013 Mar 26.
- National Oceanic and Atmospheric Administration, Earth System Research Laboratory [website]. *Trends in atmospheric carbon dioxide*. Washington, DC: National Oceanic and Atmospheric Administration. Available from: www.esrl.noaa.gov/gmd/ccgg/trends/. Accessed 2013 Mar 26.
- International Energy Agency. *World energy outlook 2011. Executive summary*. Paris, France: International Energy Agency; 2011. p. 2. Available from: www.iea.org/Textbase/npsum/weo2011sum.pdf. Accessed 2013 Mar 26.
- The World Bank. *Turn down the heat. Why a 4°C warmer world must be avoided*. Washington, DC: International Bank for Reconstruction and Development/The World Bank; 2012. Available from: http://climatechange.worldbank.org/sites/default/files/Turn_Down_the_heat_Why_a_4_degree_centigrade_warmer_world_must_be_avoided.pdf. Accessed 2013 Apr 8.
- Conference Board of Canada [website]. *Greenhouse gas (GHG) emissions*. Ottawa, ON: Conference Board of Canada; 2013. Available from: www.conferenceboard.ca/hcp/details/environment/greenhouse-gas-emissions.aspx. Accessed 2013 Apr 8.
- The World Bank [website]. *CO2 emissions (metric tonnes per capita)*. Washington, DC: The World Bank; 2013. Available from: <http://data.worldbank.org/indicator/EN.ATM.CO2E.PC>. Accessed 2013 Apr 8.
- Chan M. *World Health Organization. Climate change and health: preparing for unprecedented challenges*. Geneva, Switzerland: World Health Organization; 2007. Available from: www.who.int/dg/speeches/2007/20071211_maryland/en/index.html. Accessed 2013 Mar 26.
- Haines A, Patz JA. Health effects of climate change. *JAMA* 2004;291(1):99-103.
- Confalonieri U, Menne B, Akhtar R, Ebi KL, Hauengue M, Kovats RS, et al. Human health. In: Parry ML, Canziani OF, Palutikof JP, van der Linden PK, Hanson CE, editors. *Climate change 2007. Impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the IPCC*. Cambridge, UK: Cambridge University Press; 2007. p. 391-431.
- Costello A, Abbas M, Allen A, Ball S, Bell S, Bellamy R, et al. Managing the health effects of climate change: Lancet and University College London Institute for Global Health Commission. *Lancet* 2009;373(9676):1693-733. DOI:10.1016/S0140-6736(09)60935-1.
- Greer A, Ng V, Fisman D. Climate change and infectious diseases in North America: the road ahead. *CMAJ* 2008;178(6):715-22. DOI:10.1503/cmaj.081325.
- Furgal C, Séguin J. Climate change, health, and vulnerability in Canadian northern aboriginal communities. *Environ Health Perspect* 2006;114(12):1964-70.
- National Round Table on the Environment and the Economy. *Paying the price. The economic impacts of climate change for Canada*. Ottawa, ON: National Round Table on the Environment and the Economy; 2011. Available from: <http://nrtee-trnee.ca/wp-content/uploads/2011/09/paying-the-price.pdf>. Accessed 2013 Mar 26.
- Stern N. *The Stern review. The economics of climate change*. London, UK: HM Treasury; 2006. Available from: http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm. Accessed 2013 Mar 26.
- College of Family Physicians of Canada [website]. *Principles. Four principles of family medicine*. Mississauga, ON: College of Family Physicians of Canada; 2013. Available from: www.cfpc.ca/principles. Accessed 2013 Mar 26.
- Health Canada. *Extreme heat events guidelines: technical guide for health care workers*. Catalogue no. H128-1/11-642E. Ottawa, ON: Health Canada; 2011. Available from: www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/pubs/climat/workers-guide-travailleurs/extreme-heat-chaleur-accablante-eng.pdf. Accessed 2013 Mar 26.
- Naeher LP, Brauer M, Lipsett M, Zelikoff JT, Simpson CD, Koenig JO, et al. Woodsmoke health effects: a review. *Inhal Toxicol* 2007;19(1):67-106.
- Ogden NH, Lindsay LR, Morshed M, Sockett PN, Artsob H. The emergence of Lyme disease in Canada. *CMAJ* 2009;180(12):1221-4. DOI:10.1503/cmaj.080148.
- Centers for Disease Control and Prevention. Emergence of *Cryptococcus gattii*—Pacific Northwest 2004-2010. *MMWR Morb Mortal Wkly Rep* 2010;59(28):865-8.
- Machealth [website]. *Extreme Heat Events Program*. Hamilton, ON: Machealth. Available from: <http://machealth.ca/programs/ehe/p/ehe-landing-en.aspx>. Accessed 2013 Mar 26.
- University of British Columbia School of Population and Public Health [website]. *Outdoor Air Quality and Health and the Air Quality Health Index (AQHI)*. Vancouver, BC: University of British Columbia. Available from: www.spph.ubc.ca/CE-oaqhealth.htm. Accessed 2013 Mar 26.
- Health and Welfare Canada. *An investigation of the attitudes of Canadians on issues related to health and the environment*. Ottawa, ON: Decima Research; 1993.
- Working Group on Curriculum Review. *CanMEDS-Family Medicine*. Mississauga, ON: College of Family Physicians of Canada; 2009. Available from: www.cfpc.ca/uploadedFiles/Education/CanMeds%20FM%20Eng.pdf. Accessed 2013 Mar 26.
- Hancock T. *Doing less harm: assessing and reducing the environmental and health impact of Canada's health care system*. Branchton, ON: Canadian Coalition for Green Health Care; 2001. Available from: www.c2p2online.com/documents/CCGHC_DoingLessHarm.pdf. Accessed 2013 Mar 26.
- Canadian Coalition for Green Health Care [website]. Branchton, ON: Canadian Coalition for Green Health Care; 2011. Available from: www.greenhealthcare.ca/. Accessed 2013 Apr 8.
- NHS Sustainable Development Unit [website]. *NHS carbon footprint*. Cambridge, UK: NHS Sustainable Development Unit; 2013. Available from: www.sdu.nhs.uk/publications-resources/26/NHS-Carbon-Footprint/. Accessed 2013 Mar 26.
- Climate and Health Council [website]. London, UK: Climate and Health Council. Available from: www.climateandhealth.org/. Accessed 2013 Apr 8.
- College of Family Physicians of Canada [website]. *KYOTOplus. Joint letter to the Prime Minister of Canada*. Mississauga, ON: College of Family Physicians of Canada; 2009. Available from: www.cfpc.ca/ProjectAssets/Templates/Resource.aspx?id=1130&langType=4105. Accessed 2013 Mar 28.
- National Round Table on the Environment and the Economy. *The state of climate progress in Canada*. Ottawa, ON: National Round Table on the Environment and the Economy; 2012. Available from: <http://nrtee-trnee.ca/wp-content/uploads/2012/06/reality-check-report-eng.pdf>. Accessed 2013 Mar 26.
- New Zealand earns First Place Fossil, United States and Canada share "Colossal Fossil" [news release]. Durban, South Africa: Climate Action Network; 2011. Available from: www.climateactionnetwork.org/sites/default/files/Fossil_of_the_Day_-_Durban_-_Dec_9_2011.pdf. Accessed 2013 Mar 26.
- Ibbitson J. Kyoto withdrawal shames us all. *Globe and Mail* 2011 Dec 13. Available from: www.theglobeandmail.com/news/politics/john-ibbitson/kyoto-withdrawal-shames-us-all/article2269043/. Accessed 2013 Mar 26.
- Finch B. *Climate and Health Summit, Durban, 4th December* [blog]. London, UK: Climate and Health Council; 2011. Available from: www.climateandhealth.org/magazine/read/climate-and-health-summit-durban-4th-december_156.ht. Accessed 2013 Mar 26.
