



# Climate Change Content and Green Initiatives in Canadian Schools of Nursing

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The Canadian Coalition for Green Health Care  
Coalition canadienne pour un système de santé écologique

## Climate Change Content and Green Initiatives in Canadian Schools of Nursing

### Abstract

All Canadian schools of nursing were surveyed regarding the inclusion of content on climate change and the possible health effects in nursing courses. The survey also included questions regarding the existence of “green committees” within the schools of nursing, and school representation on similar university committees. Results revealed limited efforts at greening the curriculum, but pointed to some good ideas for expanding school of nursing initiatives.

Key Words: Climate Change, Schools of Nursing, Green Initiatives

### Discussion Paper Series

The Canadian Coalition for Green Health Care (CCGHC - the Coalition) is an alliance of committed Canadian health service organisations, associations and environmentally focused business associates that promotes the adoption of environmentally friendly and sustainable health care service delivery to complement the compassionate delivery of health care.

We encourage the adoption of resource conservation, pollution prevention principles and effective environmental management systems to reduce the Canadian health care system’s ecological impact while protecting human health.

The Coalition collaborates with health care organisations, facilities, and professionals, governments and non-governmental organisations, the private sector and others to raise awareness of this issue and to increase the capacity of the health care sector to address its environmental issues.

In keeping with our mandate of empowerment through knowledge and partnership, we support the contribution of research and knowledge to greening our health services sector. The papers in this series have been developed to incite dialogue, to contribute knowledge and stimulate debate on critical issues surrounding sustainable health service delivery. The views expressed in these Discussion Papers are those of the author(s), and do not necessarily represent those of the Coalition or its Stewardship Council.

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# Climate Change Content and Green Initiatives in Canadian Schools of Nursing

## INTRODUCTION

The facts of climate change are no longer in dispute. The United Nations International Panel on Climate Change (IPCC) has concluded that there is a very high likelihood that climate change is caused by human activity. The IPCC shared the 2007 Nobel Peace Prize for its work with Al Gore (IPCC, 2007). Even more recent studies report increasing threats to world climate due to accelerating indices of a warming planet even beyond that of the worst case scenarios detailed in the original IPCC report (Risbey, 2008). Despite the danger, global carbon equivalent emissions are still rising. The U.S. Department of Energy's Energy Information Administration recently released a report estimating that the world's carbon dioxide emissions will rise 39% by 2030 (DOE, 2009).

The health effects of climate change will be considerable and may overwhelm health systems. Governments are already preparing for an influx of climate change refugees when some parts of the globe become uninhabitable. Oxfam estimates that by 2015, 375 million people will be affected by climate-related disasters each year (Oxfam, April, 2009). In the Canadian far north, the Inuit are widely recognized as a vulnerable population (Furgal & Seguin, 2006). The rural poor of the world (Butterfield & Postma, 2009), especially women and children (Perera, 2008) are also vulnerable groups. As nursing educators, our challenge is two-fold. We must prepare students to deal with the health implications of climate change and we must work to ensure that health care systems around the world reduce their carbon footprints.

Various organizations have called on health care to meet these goals. The International Congress of Nurses (ICN) has issued a position statement that calls on nurses to support action on climate change in their respective countries (ICN, 2008). The Canadian Nurses Association (CNA) has posted an excellent summary of climate change issues of concern for nurses on its website, including links to other organizations and a list of actions for nurses and associations. The CNA has approved the establishment of a Canadian Nursing Environmental Health Group (CNA,


2008) and the Saskatchewan Nurses Association already has such an interest group (Regina Leader-Post, 2008). The CNA, the Canadian Medical Association (CMA), and the Canadian Coalition for Green Health Care (CCGHC) have issued a joint policy statement about climate change (CNA, 2009) urging nurses and physicians to act both in their personal and professional lives. The American Nurses Association (ANA) released a position statement in 2008 that recognizes the serious threat of climate change and supports efforts to reduce greenhouse gasses in health care (ANA, 2008). An editorial in the British Medical Journal in 2008 called for the British Medical Association (BMA) Board of Science to pressure government to reduce the carbon footprint of the National Health System trusts (BMJ, 2008). The Stern Report to the British government agreed, stating that the evidence for human-caused global climate change is unequivocal and that a concerted immediate global response is required (Her Majesty's Treasury, 2007).

## HEALTH CONCERNS OF CLIMATE CHANGE

Climate change has been called a public health concern (Azfal, 2007; Frumkin, Hess, Luber, Malilay & McGeehin, 2008; Ebi, Mills, Smith, & Grambsch, 2006), a social justice issue (CNA, 2008; Butterfield & Postma, 2009), and a challenge to Nightingale's legacy (Shaner-McRae, McRae, & Jas, 2007). Indeed, the effects of climate change fall disproportionately on vulnerable populations of poor, elderly, women, children, and those in developing countries (Health Care Without Harm, 2009). Kofi Annan, former UN Secretary General, describes climate change as the greatest humanitarian challenge facing the world (Guardian, 2009).

Significant health impacts from climate change have been identified, including physical and mental health effects. Predictions include wildly irregular weather causing crop failures, disease, flooding, famine, droughts, increased parasitic infections, increased pollen levels, movement of tropical diseases to more northern locations, and more widespread effects of insect-borne diseases like dengue fever and malaria (Barlow, 2008).





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Canadians are at higher risk for emerging health threats from zoonotic diseases as a result of climate change than other countries (Charron, 2002). Extreme weather events, poor air quality and increased pollution will cause increased respiratory difficulties (Azfal, 2007), damage public health infrastructure, create social disruption and diminish quality of life, resulting in further increases in the cost of health care. Because of climate change, there are elevated risks of decreased fresh water supplies to many people in the world (Thompson, 2004), collapsing fisheries, and decreased food production (McMichael, 2001).

Fussell (2008) argues that current conceptual models from environmental epidemiology are inadequate for assessing and proposing adaptation to climate change and that new models must be created to deal with climate-related health risks. Methods for country-level assessments of vulnerability to the health effects of climate change have been developed (see Ebi, Kovats & Menne, 2006). The WHO is developing risk assessment methodologies for the health effects of climate change (Campbell-Lendrum & Woodruff, 2006), but these methodologies must be widely implemented to have any effect.

## THE CARBON FOOTPRINT OF HEALTH CARE

Health care is a significant emitter of greenhouse gasses, yet health care providers consider wasting resources such as paper and water to be justified by infection control (Shaner-McRae, McRae, & Jas, 2007). About 2.1 per cent of Canada's total greenhouse gas emissions are produced by the health sector (Hancock, 2001). In the U.S., "health-care buildings are the second most energy-intensive commercial sector buildings; the health sector spends US\$ 8.5 billion on energy every year to meet patient needs, and hospitals use about twice as much total energy per square foot as traditional office space.

The National Health Service (NHS) in England has calculated its carbon footprint at more than 18 million tonnes of CO<sub>2</sub> each year – 25% of total public sector emissions." (WHO, 2009).

Sarah Lieberman, policy advisor to the Saskatchewan Registered Nurses Association said, "*Some of the key areas nurses can work on include waste management, identifying toxins in the environment and creating recycling programs, and trying to move [the Going Green agenda] forward and getting people to understand what matters... What makes this green movement unique to nursing is the nurses' ability to work and educate clients around the impact of climate change and how global warming and other environmental pollutants negatively affect their health and the communities they live in.*" (Regina Leader Post, 2008).

## METHOD

In order to determine how many schools of nursing in Canada have integrated information about climate change and health into their curricula, we surveyed every BSN program in the country, using both paper and online versions of the survey. Seven questions were asked regarding the existence of a Green Committee in the school of nursing, in the university, and in partner clinical agencies, plus questions regarding the existence, location and type of information provided to students about climate change and its effects on health. Respondents were invited to provide comments at the bottom of the survey.

## RESULTS

Surveys were sent to all 89 BSN schools of nursing in Canada, in English and in French. The return rate was 42%. Forty-two (42) were returned: eight from Alberta, four from BC, five from Manitoba, one from Newfoundland, three from Nova Scotia, eleven from Ontario, four from Quebec and two from Saskatchewan, and four responses from unknown locations. There were no discernible responses from Yukon, Nunavut, New Brunswick, or Prince Edward Island, but responses from these provinces could have been among the unidentifiable returns.

Eight out of the 42 responding schools (19%) have established a Green (or Environmental or Sustainability) Committee and 29 schools (69%) reported that their university has a Green (or Environmental or Sustainability) Committee, with four schools reporting that their school is

represented on the university committee (9%). Seventeen schools (40%) reported that one or more of their clinical agencies has a Green (or Environmental or Sustainability) Committee. Nineteen schools (45%) responded that their students receive educational content in climate change or environmental sustainability.

The most commonly cited topic for which students receive content is the predicted health effects of climate change (16), followed by the role of the nurse in addressing climate change (15), personal actions that can be taken to address climate change (15), predicted consequences of climate change (13), the role of public health in addressing climate change (10), mechanisms and causes of climate change (6) and the Intergovernmental Panel on Climate Change (IPCC) data on climate change (4). The most commonly cited class in which this content is presented is the community health nursing course (8), but some schools have electives within nursing (1) or science (3). One school said that the content was threaded throughout the curriculum, and two schools reported that they put this information in the leadership or professional issues course. One school has a health and environment course and one school addresses this information in the health promotion course.

When asked to describe current green initiatives in their school, sixteen (38%) of the schools cited recycling of paper and cardboard, compostables, cans, bottles, plastics, or toner cartridges. Seven schools (16%) indicated that they were trying to move toward a paperless campus.

Examples of green initiatives provided by schools included giving first year students a stainless steel re-usable coffee mug, encouraging car-pooling, using green cleaning products, buying printers that print double sided by default (2), turning off computers when not in use (3), moderating temperatures in offices and classrooms (2), banning bottled water, electronic submission of assignments (2), encouraging the use of public transportation, using paper med cups instead of plastic, sending used textbooks to other countries, encouraging telecommuting from home, using electronic calendars instead of paper calendars, and keeping electronic student data instead of using paper.

## ANALYSIS AND RECOMMENDATIONS

Schools of nursing in Canada are beginning to take action with regard to 1) establishing a Green Committee, 2) providing students with information regarding climate change and health, and 3) reducing their carbon footprint. It is more common for a university to have a Green Committee than for a school of nursing, but only four of the schools have a representative on their university committee. Hopefully, more schools will create Green Committees in the future or have a representative on their university committee.

Only forty-seven percent of the sample schools of nursing provide students with content on climate change, the majority of this content appearing in a community health nursing course, where the predicted health effects of climate change are discussed. The information on the CNA website can be very helpful in generating content for inclusion in

nursing courses. Included on the website are a video, an educational module that includes, a PowerPoint presentation and student objectives. A model curriculum for nursing courses on climate change and health is needed, perhaps to be used as a nursing elective.

Only 19% of the schools have established a Green Committee, but 69% of the universities have Green Committees and 40% of the clinical agencies have them. Many more schools of nursing could benefit from a Green Committee to address issues specific to nursing and nursing education. Only 45% of the responding schools include content on climate change and health in their curriculum. Given the importance of this topic in the future careers of our students, this percentage should be increased.

Many excellent initiatives for reducing carbon emissions were mentioned by survey respondents, but very few schools take part in more than two. A few schools mentioned that students were working to further these goals.

Students are an important resource for creating committees, performing waste audits, and gathering information from other schools to provide action items to be considered by the faculty. Projects in community health classes are a potential source of ideas for green initiatives to which students can contribute. Having a Green Committee within the school would be helpful to assess and evaluate the relative effectiveness of such measures. Using students to gather data would be one educationally attractive activity that involves the entire school.

## CONCLUSIONS

Public health in the future will face enormous problems related to climate change, some of which are not yet identified (McCartney, Hanlon & Romanes, 2007). There are many human roadblocks to global sustainability, and basic world views must be shifted (Campbell, 2008). Nursing and schools of nursing can help guide citizens of every country to think differently about climate change (Beddoe, Costanza, Farley, Garza, Kent, Kubiszewski, Martinez, McCowen, Murphy, Myers, Ogden, Stapleton & Woodward, 2009; Roehr, 2007).

A survey published in 2004 indicated that the population of the Canadian province of Alberta, while highly concerned about health problems related to the environment, do not consider environmental issues when shopping for consumer goods or making transportation decisions (Plotnikoff, Wright & Karunamuni, 2004). We as health educators need to put environmental health concerns into nursing's scope of practice so we can teach others how to reduce their carbon footprint (Condon & Welker-Hood, 2007). Nursing instructors have been urged to put climate change into the curriculum (Hunt, 2006) and Canadian nursing schools are beginning to respond.

There are many ways for health professions to reduce emissions (Schwartz, Parker, Glass & Hu, 2006), many of which were mentioned by our survey respondents. There are several online resource guides for health professionals





## GREEN INITIATIVES

Examples of green initiatives provided by schools included giving first year students a stainless steel re-usable coffee mug, encouraging car-pooling, using green cleaning products, buying printers that print double sided by default, turning off computers when not in use, moderating temperatures in offices and classrooms, banning bottled water, electronic submission of assignments, encouraging the use of public transportation, using paper med cups instead of plastic, sending used textbooks to other countries, encouraging telecommuting from home, using electronic calendars instead of paper calendars, and keeping electronic student data instead of using paper.

(<http://ehnursing.org>). The Global Healthcare Waste Project ([www.gefmedwaste.org](http://www.gefmedwaste.org)) aims to raise awareness about health care waste. University of Maryland hosts a site about greening schools of nursing ([www.envirn.umaryland.edu/greenschool/index.html](http://www.envirn.umaryland.edu/greenschool/index.html)).

The Canadian Coalition for Green Health Care ([www.greenhealthcare.ca](http://www.greenhealthcare.ca)) and Health Care Without Harm ([noharm.org](http://noharm.org)) both have websites that offer valuable resources for health professionals wishing to integrate information on climate change and health into their curriculum. Australian nurses are on the forefront of addressing climate change (Smith, 1996), including the mental health implications (Morrissey & Reser, 2007). The Canadian Centre for Environmental Education (CCEE), established in 2005 by ECO Canada and Royal Roads University, offers education and professional development opportunities including a distance-based post-graduate Certificate in Environmental Practice (CCEE, 2009). Green is a growth industry, and nursing schools should be in the vanguard of these initiatives.



## REFERENCES

- ANA (2008). *American Nurses Association 2008 House of Delegates Resolution on Global Climate Change*. Retrieved January 28, 2010 from: <http://www.nursingworld.org/MemberCenter-Categories/ANAGovernance/HODArchives/2008HOD/ActionsAdopted/GlobalClimateChangeandHumanHealth.aspx>
- Azfar, B.M. (2007). *Global warming: a public health concern*. *Online Journal of Issues in Nursing* 12(2). Retrieved June 4, 2009, from <http://web.ebscohost.com.ezproxy.tru.ca/ehost/detail?vid=6&hid=2&sid=7c6ba735-c36f-491c-b10d-85ecfc322343%40sessionmgr3&bdata=JnNpdGU9ZWlhvc3QtG1ZlZQ%3d%3d#d=b=c8h&AN=2009757139#db=c8h&AN=2009757139>
- Barlow, G. (2008). *Nurses feel impact of climate change*. *Australian Nursing Journal* 15(10), 24-26.
- Beddoe, R., Costanza, R., Farley, J., Garza, E., Kent, J., Kubiszewski, I., et al. (2009). *Overcoming systemic roadblocks to sustainability: The evolutionary redesign of worldviews, institutions, and technologies*. *Proceedings of the National Academy of Sciences*, 106(8), 2483-2489. doi: 10.1073/pnas.0812570106
- Bloice, C., & Hallinan, C. (2005). *Global warming: Katrina-style storms are just one of many threats to human health*. *Revolution: The Journal for RNs and Patient Advocacy*, 6(5), 12-17.
- BMJ (2008). *Global Environmental Change and Health: Impacts, inequalities and the health sector*. *British Medical Journal* 26 January, 2008. Retrieved on January 28, 2010 from: <http://www.bmj.com/cgi/content/full/336/7637/191>
- Butterfield, P., Postma, J. & the ERRNIE research team. (2009). *The TERRA Framework: Conceptualizing rural environmental health inequities through an environmental justice lens*. *Advances in Nursing Science* 32(2), 107-117.
- Campbell, S. (2008). *Nursing the planet*. *Primary Health Care*, 18(3), 41-48. doi: Article
- Canadian Nurses Association. (2006). *Social justice: A means to an end, an end itself*. Ottawa: Author. Retrieved July 26, 2007, from [http://www.cna-nurses.ca/CNA/documents/pdf/publications/Social\\_Justice\\_e.pdf](http://www.cna-nurses.ca/CNA/documents/pdf/publications/Social_Justice_e.pdf)
- Canadian Nurses Association. (2008). *The role of nurses in addressing climate change*. Ottawa: Author.
- CCEE (2009). *The Canadian Centre For Environmental Education*. Retrieved June 4, 2009 from <http://www.ccee.ca/about.aspx>
- Charron, D. F. (2002). *Potential impacts of global warming and climate change on the epidemiology of zoonotic diseases in Canada*. *Canadian Journal of Public Health. Revue Canadienne De Santé Publique*, 93(5), 334-335. Retrieved June 4, 2009, from <http://www.ncbi.nlm.nih.gov/pubmed/12353451>
- CNA (2008). *CNA emerging groups*. Retrieved June 4, 2009 from [http://www.cna-aiic.ca/CNA/about/members/emerging/default\\_e.aspx](http://www.cna-aiic.ca/CNA/about/members/emerging/default_e.aspx)
- CNA (2009). *Joint Position Statement: Environmentally Responsible Activity in the Health-Care Sector*. Retrieved October 30, 2009 from [http://www.cna-aiic.ca/CNA/documents/pdf/publications/JPS99\\_Environmental\\_e.pdf](http://www.cna-aiic.ca/CNA/documents/pdf/publications/JPS99_Environmental_e.pdf)
- Condon, M. & Welker-Hood, K. (2007). *Environment, health and safety*. *American Nurse Today* 2(6), 56.
- Coote, A. (2008). *How should health professionals take action against climate change?* *British Medical Journal* 336, p. 733-734.
- Dietz, S., Hope, C., Stern, N., & Zenghelis, D. (2007). *Reflections on the Stern Review (1). A robust case for strong action to reduce the risks of climate change*. *World Economics*, 8, 121-168. Retrieved October 31, 2007, from [http://www.hm-treasury.gov.uk/media/E/8/World\\_Economics1.pdf](http://www.hm-treasury.gov.uk/media/E/8/World_Economics1.pdf)
- DOE (May, 2009). *International Energy Outlook*. Retrieved June 4, 2009 from [http://www.eia.doe.gov/oiaf/ieo/pdf/0484\(2009\).pdf](http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2009).pdf)
- Ebi, K. L., Kovats, R. S., & Menne, B. (2006). *An Approach for Assessing Human Health Vulnerability and Public Health Interventions to Adapt to Climate Change*. *Environmental Health Perspectives*, 114(12), 1930-1934. doi: 10.2307/4119609
- Ebi, K. L., Mills, D. M., Smith, J. B., & Grambsch, A. (2006). *Climate Change and Human Health Impacts in the United States: An Update on the Results of the U.S. National Assessment*. *Environmental Health Perspectives*, 114(9), 1318-1324. doi: 10.1289/ehp.8880
- Environment Canada. (2007). *Government of Canada five-year progress report: Canada-wide standards for particulate matter and ozone*. Retrieved April 21, 2008, from [http://www.ec.gc.ca/cleanair-airpur/caol/pollution\\_issues/cws/s4\\_e.cfm](http://www.ec.gc.ca/cleanair-airpur/caol/pollution_issues/cws/s4_e.cfm)
- Frumkin, H., Hess, J., Luber, G., Malilay, J., & McGeehin, M. (2008). *Climate Change: The Public Health Response*. *Am J Public Health*, 98(3), 435-445. doi: 10.2105/AJPH.2007.119362
- Furgal, C., & Jacinthe Seguin. (2006). *Climate Change, Health, and Vulnerability in Canadian Northern Aboriginal Communities*. *Environmental Health Perspectives*, 114(12), 1964-1970. doi: 10.2307/4119614
- Fussel, H. M. (2008). *Assessing adaptation to the health risks of climate change: what guidance can existing frameworks provide?* *International Journal of Environmental Health Research* 18(1), 37-63.
- Fussel, H.-M., Klein, R., & Ebi, K. (2006). *Adaptation assessment for public health*. In B. Menne & K. Ebi (Eds.), *Climate change and adaptation strategies for human health* (pp. 41- 62). Dordrecht, Germany: Springer.
- Government of Canada. (2007, April 26). *Action on climate change and air pollution*. In *Canada's new government announces targets to tackle climate change and reduce air pollution* [Press release]. Retrieved July 27, 2007, from <http://www.ecoaction.gc.ca/news-nouvelles/20070426-3-eng.cfm>

*Guardian* (May 29, 2009). *Global arming causes 300,000 deaths a year, says Kofi Annan think tank*. <http://www.guardian.co.uk/environment/2009/may/29/1>, accessed October 21, 2009.

Hancock, T. (2001). *Doing Less Harm: Assessing and Reducing the Environmental Impact of Canada's Health Care System*. The Canadian Coalition For Green Health Care: [www.greenhealthcare.ca](http://www.greenhealthcare.ca)

Health Canada. (2005). *Your health and a changing climate: Information for health professionals*. Ottawa: Minister of Health.

Health Canada. (2005). *Your health and a changing climate: Information for health professionals*. Ottawa: Minister of Health. *Health Care Without Harm* (2009). *The issue*. [http://www.no-harm.org/us\\_canada/issues/energy/](http://www.no-harm.org/us_canada/issues/energy/). Accessed October 21, 2009.

Her Majesty's Treasury (2007). *Stern Review: The Economics of Climate Change*. Retrieved May 26, 2009 from [http://www.hm-treasury.gov.uk/stern\\_review\\_report.htm](http://www.hm-treasury.gov.uk/stern_review_report.htm)

Hunt, G. (2006). *Climate change and health*. *Nursing Ethics*, 13(6), 571-572. Retrieved June 4, 2009, from <http://www.ncbi.nlm.nih.gov/pubmed/17193799>

ICN (2008). *Position Statement on Climate Change*. Retrieved June 4, 2009 from <http://www.icn.ch/psclimate.htm>

Intergovernmental Panel on Climate Change. (2007a). *Climate change 2007: the physical science basis: Summary for policy-makers. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press.

Intergovernmental Panel on Climate Change. (2007b). *Human health (pp. 392-431). Climate change 2007: impacts, adaptations and vulnerability: Summary for policymakers. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press.

IPCC (2007). *Climate change 2007*. Retrieved May 26, 2009 from <http://www.ipcc.ch/>

Koppe, C., Kovats, R. S., Jendritzky, G., & Menne, B. (2004). *Heat waves: Risks and Responses*. *Health and Global Change Series No. 2*. World Health Organization Europe. Retrieved January 9, 2007, from <http://www.euro.who.int/document/e82629.pdf>

McBean, G. A. (2005). *Risk mitigation strategies for tornadoes in the context of climate change and development*. *Mitigation and Adaptation Strategies for Global Change*, 10, 357-366.

McMichael, A. (2003). *Global climate change and health: An old story writ large*. In A. McMichael, D. H. Campbell-Lendrum, C. Corvalan, K. Ebi, & A. Githeko (Eds.), *Climate change and human health: Risks and responses (pp. 1-17)*. Geneva: World Health Organization.

McMichael, A. J., Powles, J. W., Butler, C. D., & Uauy, R. (2007). *Food, livestock production, energy, climate change, and health*. *The Lancet*, 370(9594), 1253-1263. doi: 10.1016/S0140-6736(07)61256-2

McMichael, A. J., Woodruff, R. E., & Hales, S. (2006). *Climate change and human health: present and future risks*. *The Lancet*, 367(9513), 859-869. doi: 10.1016/S0140-6736(06)68079-3

Nickels, S., Furgal, C., Buell, M., & Moquin, H. (2005). *Unikkaaqatigiit – Putting the human face on climate change: Perspectives from Inuit in Canada*. Ottawa: Inuit Tapiriit Kanatami, Nasivik Centre for Inuit Health and Changing Environments (Université Laval) & Ajunnginiq Centre (National Aboriginal Health Organization).

Oxfam (April, 2009). *The Right to Survive: the humanitarian challenge for the twenty-first century*. Retrieved June 4, 2009 from [http://www.oxfam.org.uk/resources/papers/downloads/right\\_to\\_survive\\_report\\_text.pdf](http://www.oxfam.org.uk/resources/papers/downloads/right_to_survive_report_text.pdf)

Patz, J. A., Campbell-Lendrum, D., Holloway, T., & Foley, J. A. (2005). *Impact of regional climate change on human health*. *Nature*, 438, 310-317.

Perera, F. P. (2008). *Children Are Likely to Suffer Most from Our Fossil-Fuel "Addiction"*. *Environmental Health Perspectives*. doi: 10.1289/ehp.11173

Pope, C. A., & Dockery, D.W. (2006). *Health effects of fine particulate air pollution: Lines that connect*. *Journal of Air and Waste Management Association*, 56, 709-742.

Regina Leader Post (November 29, 2008). *Nursing association promotes greener health-care system*. Retrieved October 22, 2009 from: <http://www2.canada.com/saskatoonstarphoenix/news/story.html?id=c4f2e224-aa9a-4f20-a3ef-813fe3e3b813>.

Risbey, J.S. (2008). *The new climate discourse, alarmist or alarming?* *Global Environmental Change* 18(1), 26-37. Retrieved January 28, 2010 from [http://www.sciencedirect.com/science?\\_ob=ArticleURL&\\_udi=B6VfV-4PG2Krk-1&\\_user=742544&\\_coverDate=02%2F29%2F2008&\\_rdoc=1&\\_fmt=high&\\_orig=search&\\_sort=d&\\_docanchor=&view=c&\\_searchStrId=1184699886&\\_rerunOrigin=scholar.google&\\_acct=C000041223&\\_version=1&\\_urlVersion=0&\\_usefid=742544&md5=1f6fc4704dd8a67912de813af971b91a#sec7](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VfV-4PG2Krk-1&_user=742544&_coverDate=02%2F29%2F2008&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1184699886&_rerunOrigin=scholar.google&_acct=C000041223&_version=1&_urlVersion=0&_usefid=742544&md5=1f6fc4704dd8a67912de813af971b91a#sec7)

Roehr, B. (2007). *Doctors should speak out on climate change, expert says*. *British Medical Journal* 335, 636.

Shaner-McRae, H., McRae, G., & Jas, V. (2007). *Environmentally safe health care agencies: nursing's responsibility, Nightingale's legacy*. *Online Journal of Issues in Nursing* 12(2). Retrieved May 26, 2009 from [http://www.medscape.com/viewarticle/561370\\_1](http://www.medscape.com/viewarticle/561370_1).

Smith, M. (1996). *Climate change and your health*. *Australian Nursing Journal* (July 1993), 4(3), 20-23. Retrieved June 4, 2009, from <http://www.ncbi.nlm.nih.gov/pubmed/8945117>



Thompson, M. (2004). *Health implications of climate change. The Oregon Nurse*, 69(3), 13. Retrieved June 4, 2009, from <http://www.ncbi.nlm.nih.gov/pubmed/15493600>

United Kingdom Treasury. (2006). *Stern review on the economics of climate change*. London: Author.

While, A. (2006). *Climate change should matter to nurses. British Journal of Community Nursing*, 11, 454.

WHO (2009). *Healthy Hospitals, Healthy Planet, Healthy People: Addressing climate change in health care settings*. [http://www.noharm.org/lib/downloads/energy/Healthy\\_Hosp\\_Planet\\_Peop.pdf](http://www.noharm.org/lib/downloads/energy/Healthy_Hosp_Planet_Peop.pdf). Accessed October 21, 2009.

World Health Organization, Regional Office for Europe. (2005). *Health and climate change: The now and how. A policy action guide*. Retrieved July 11, 2007, from [http://www.euro.who.int/eprise/main/WHO/Progs/GCH/Publications/20051202\\_1](http://www.euro.who.int/eprise/main/WHO/Progs/GCH/Publications/20051202_1)

World Health Organization. (2003). *Climate change and human health: Risks and responses*. Geneva: Author.

World Health Organization. (n.d.). *Global climate change: Implications for international public health policy*. Retrieved January 8, 2008, from <http://www.who.int/bulletin/volumes/85/3/06-039503/en/>

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The Canadian Coalition for Green Health Care  
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The Canadian Coalition for Green Health Care is strongly committed to being an active vehicle for enabling positive ecological change within the Canadian health care landscape. Please visit us on the web at [www.greenhealthcare.ca](http://www.greenhealthcare.ca) or contact us at [feedback@greenhealth.ca](mailto:feedback@greenhealth.ca)