

The link between climate change and the health of Canadians

September 20, 2019

Clean Energy Canada is a climate and clean energy program at the [Morris J. Wosk Centre for Dialogue](#) at [Simon Fraser University](#). Through media briefs, we aim to provide journalists with useful factual and contextual information related to Canada's clean energy transition. Please use this as a resource and let us know if there are any topics that you would like to see for future media briefs.

Climate change is already negatively impacting the health of Canadians, impacts that will become more severe in relation to the extent of warming that occurs. The link between airborne pollution from the combustion of fossil fuels and respiratory health is well-known. But as our climate changes, the effect of altering weather patterns on public health has also been the subject of considerable study, and increasingly, [media attention](#).¹

In fact, the impact of climate change is such that it has been described as a [public health emergency](#),² and in February this year, representatives from five Canadian health organizations described it as the “[greatest public health challenge of the 21st century](#).”³ Similarly, the World Health Organization has pronounced it to be the [defining health issue of the 21st century](#).⁴ [Medical students in Canada](#) are joining the climate strikes, demanding stronger climate action to address public health issues.⁵

[Studies have shown that](#) taking climate action has multiple health benefits, beyond just addressing climate change, “ranging from improved physical activity resulting from active commuting, to reduced respiratory illnesses from decreased air pollution.”⁶

KEY FACTS

Below are some of the recent key studies linking climate change to public health. Additionally, the [Canadian Association of Physicians for the Environment](#) has produced a summary of the health risks.⁷

**Infectious disease:**

- A [recent Morgan Stanley report](#) concludes that warming temperatures will increase the risk of contracting an infectious disease in an additional one-billion people over the coming 50 years.⁸
- Due to warmer winters, [cases of Lyme disease increased more than 300%](#) between 2009 and 2015. Without prompt treatment, Lyme disease can lead to paralysis, arthritis, and in some cases death.⁹
- Temperature increases are linked to increases in [gastrointestinal infections](#),¹⁰ like salmonella, from food and water contamination, while [warming oceans have been shown](#) to promote algal blooms and bacteria that can affect human health.¹¹
- [There is evidence that changing environments](#) due to climate change is affecting instances of animal-to-human disease transfer, like bird flu.¹²¹³

Air pollution:

- Fossil fuel combustion produces fine-particulate air pollution, which leads to the premature death of an estimated [14,400 people across Canada](#).¹⁴
- Fine-particulate air pollution [costs Canada overall about \\$53.5 billion](#) in health-related costs per year.¹⁵
- Air pollution has been shown to be especially harmful during pregnancy and can [increase risks of miscarriage](#),¹⁶ with recent [research suggesting](#) particles of pollution can cross the placental barrier and damage the fetus.¹⁷
- Climate change will result in warmer, longer, and drier summers, which will [increase air pollution risks](#) from forest fires, dust storms, and smog.¹⁸
- While particulate air pollution remains the single largest overall threat to respiratory health, a multitude of other climate-related factors also degrade air quality,¹⁹ including:
 - [Pollen from changing growing seasons](#).²⁰
 - [Dust from droughts](#).²¹
 - [Smoke from wildfires](#).²²

Heatwaves:

- The “heat island effect” intensifies temperatures in cities; as more and more Canadians migrate to urban centres, [health risks are likely to increase](#).²³
- In Montreal, extreme heat contributed to the premature death of 66 people in 2018²⁴
- Between 2021 and 2050, [experts anticipate](#) Toronto will see more than 30 extreme heat days annually.²⁵
- [A recent study](#) predicts that Canada could see five times more heat-related deaths between 2031 and 2080, compared to 1984 to 2015.²⁶

Wildfire:

- Wildfires have [exacerbated heart and lung conditions](#), and in recent summers have kept thousands of Canadians indoors.²⁷
- [Multiple studies have associated increased smoke with respiratory illnesses](#), which can lead to long-term effects or death.²⁸ Increases in wildfires places strain on public health infrastructure.

Additional health risks:

- Displacement and emotional trauma from severe wildfire and flooding events can result in [produce post-traumatic stress disorder](#).²⁹ Recent wildfires in the northern territories [were reported to](#) have acute and long-term negative impacts for mental and emotional well-being.³⁰
- As the intensity and frequency of such events increases, [Canadians will be affected](#) by compromised physical and mental well-being.³¹ The [impacts of climate change on mental health](#) is typically thought to disproportionately affect those who are most marginalized.³²
- [Researchers have documented](#) serious anxiety and post-traumatic stress-disorder-type symptoms among those impacted by the 2016 Fort McMurray fire.³³
- [Northern populations will be disproportionately affected](#), with climate change impacting traditional food sources leading to not only dietary—but psychological and socio-cultural—consequences.³⁴
- Asthma, hay fever, and declines in lung function are worsening with [more intense and prolonged pollen seasons](#).³⁵
- [Damage to public health infrastructure](#) from severe weather events is also likely to negatively impact Canadians' health.³⁶

RESOURCES

For further information, the following people have expertise in the field and can provide additional information about climate change and health.

- Dr. Courtney Howard, President, Canadian Association of Physicians for the Environment. courtghoward@gmail.com
- Possibly one of the med students?
- The [Canadian Medical Association](#), Media contact, mediainquiries@cma.ca



¹ Carrington, Damian, The Guardian, September 17, 2019. “Air pollution particles found on foetal side of placentas – study.” https://www.theguardian.com/environment/2019/sep/17/air-pollution-particles-found-on-foetal-side-of-placentas-study?CMP=share_btn_tw

² The Canadian Public Health Association, “Climate change is a public health emergency”. April 5, 2019. <https://cpa.ca/climate-change-public-health-emergency>

³ The Canadian Public Health Association, “Health Professionals to Federal Political Parties: Action Needed to Prevent Catastrophic Climate Change.” February 5, 2019 <https://www.cpha.ca/health-professionals-federal-political-parties-action-needed-prevent-catastrophic-climate-change>

⁴ Chan, Margaret. The World Health Organization. “Climate change and health: preparing for unprecedented challenges.” December 10 2007. https://www.who.int/dg/speeches/2007/20071211_maryland/en/

⁵ Letourneau S, Liang K and Hackett F, The Province. “Sasha Letourneau, Kevin Liang and Finola Hackett: Medical students take a stand on climate change.” September 16, 2019. <https://theprovince.com/opinion/op-ed/sasha-letourneau-kevin-liang-and-finola-hackett-medical-students-take-a-stand-on-climate-change>

⁶ Smith KR, Woodward A, Campbell-Lendrum D, et al. Human health: impacts, adaptation, and co-benefits. In: Field CB, Barros VR, Dokken DJ, et al., editors. Climate Change 2014: Impacts, Adaptation, and Vulnerability Part A: Global and Sectoral Aspects Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. London (UK): Cambridge University Press; 2014. p. 709-54. https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap11_FINAL.pdf

⁷ The Canadian Association of Physicians for the Environment. “How Climate Change Affects Your Health.” <https://cape.ca/wp-content/uploads/2019/09/Patient-Factsheet-Sept.-2019.pdf>

⁸ Morgan Stanley, “Biopharma, Climate Change and the Rise of Infectious Disease.” August 28, 2019. <https://www.morganstanley.com/ideas/climate-change-biopharma-infectious-diseases>

⁹ Ogden NH, St-Onge L, Barker IK, Brazeau S, Bigras-Poulin M, Charron DF, Francis CM, Heagy A, Lindsay LR, Maarouf A, Michel P, Milord F, O’Callaghan CJ, Trudel L, Thompson RA. “Risk maps for range expansion of the Lyme disease vector, Ixodes scapularis, in Canada now and with climate change.” *Int J Health Geogr.* 2008 May 22;7:24. doi: 10.1186/1476-072X-7-24.

¹⁰ “Ghazani, Maryam et al. “Temperature Variability and Gastrointestinal Infections: A Review of Impacts and Future Perspectives.” *International journal of environmental research and public health* vol. 15,4 766. 16 Apr. 2018, doi:10.3390/ijerph15040766 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5923808/>

¹¹ Craig, Robin Kundis, Warming Oceans, Coastal Diseases, and Climate Change Public Health Adaptation (June 30, 2019). Sea Grant Law & Policy Journal (2020, Forthcoming). Available at SSRN: <https://ssrn.com/abstract=3413071>

¹² Science Daily, “Changing climate may affect animal-to-human disease transfer.” May 1, 2019. <https://www.sciencedaily.com/releases/2019/05/190501114619.htm>

¹³ Government of Canada, Health Canada, Public Health Agency of Canada. “Science Narrative: Climate Change Impacts on the Health of Canadians.” April 2017. http://publications.gc.ca/collections/collection_2017/aspc-phac/HP5-122-2017-eng.pdf

¹⁴ Health Canada. “Health Impacts of Air Pollution in Canada: An estimate of premature mortalities.” November 2017. http://publications.gc.ca/collections/collection_2018/sc-hc/H144-51-2017-eng.pdf

¹⁵ Howard C, Rose C, Rivers N. “Lancet Countdown 2018 Report: Briefing for Canadian Policymakers.” Canadian Medical Association, Canadian Public Health Association, The Lancet. November 2018. <http://www.lancetcountdown.org/media/1418/2018-lancet-countdown-policy-brief-canada.pdf>

¹⁶ Claire L. Leiser, Heidi A. Hanson, Kara Sawyer, Jacob Steenblik, Ragheed Al-Dulaimi, Troy Madsen, Karen Gibbins, James M. Hotaling, Yetunde Oluseye Ibrahim, James A. VanDerslice, Matthew Fuller. “Acute effects of air pollutants on spontaneous pregnancy loss: a case-crossover study.” *Fertility and Sterility*, Volume 111, Issue 2, 2019, <https://doi.org/10.1016/j.fertnstert.2018.10.028>. <https://www.sciencedirect.com/science/article/pii/S001502821832154X>

¹⁷ Bové, Hannelore, Bongaerts, Eva, Slenders, Eli, Bijmens, Esmée M., Saenen, Nelly D., Gyselaers, Wilfried, Van Eyken, Peter, Plusquin, Michelle, Roeffaers, Maarten B. J., Ameloot, Marcel, Nawrot, Tim S., 2019, Ambient black carbon particles reach the fetal side of human placenta, *Nature Communications*, 3866, <https://www.nature.com/articles/s41467-019-11654-3>

¹⁸ Canadian Association of Physicians for the Environment (CAPE). Climate Change Toolkit for Health Professionals: Module 3 – Climate Change Health Impacts across Canada. April 2019. <https://cape.ca/wp-content/uploads/2019/04/Module-3-ready-to-upload-SOLO-April-5-2019.pdf>

¹⁹ Government of Canada. “Environment Canada. Canadian Environmental Sustainability Indicators.” November 2006. <http://publications.gc.ca/Collection/Statcan/16-251-X/16-251-XIE2006000.pdf>

²⁰ Séguin, Jacinthe. Government of Canada. Health Canada. “Human Health in a Changing Climate: A Canadian Assessment of Vulnerabilities and Adaptive Capacity.” 2008. http://publications.gc.ca/collections/collection_2008/hc-sc/H128-1-08-528E.pdf

²¹ U.S. Department of Health & Human Services. Centers for Disease Control and Prevention. National Center for Environmental Health. “Drought and Your Health.” <https://www.cdc.gov/features/drought/index.html>

²² Benmarhnia, Tarik. Mathlouthi, Fatma. Smargiassi, Audrey. Institut national de santé publique du Québec (INSPQ) Chair on Air Pollution, Climate Change and Health. “Health Impacts of Particles from Forest Fires.” 2014. https://www.inspq.qc.ca/pdf/publications/1793_Health_Impacts_Forest_Fires.pdf

²³ Health Canada. Water, Air and Climate Change Bureau. Healthy Environments and Consumer Safety Branch. “Heat Alert and Response Systems to Protect Health: Best Practices Guidebook.” 2012.

²⁴ Lowrie, Megan, The Canadian Press, “Montreal unveils plan to respond to heat waves after 66 deaths last year”, July 4, 2019

²⁵ Prairie Climate Centre. Climate Change and Canada’s Cities. “Climate Atlas of Toronto.” March 2019 <https://climateatlas.ca/sites/default/files/cityreports/Toronto-EN.pdf>

²⁶ Guo, Yuming et al, PLOS|Medicine, “ Quantifying excess deaths related to heatwaves under climate change scenarios: A multicountry time series modelling study”, July 31, 2018.

²⁷ Henderson S., Johnston F. “Measures of forest fire smoke exposure and their associations with respiratory health outcomes.” *Current Opinion in Allergy and Clinical Immunology*. 2012 Jun;12(3):221-7. doi: 10.1097/ACI.0b013e328353351f. <https://www.ncbi.nlm.nih.gov/pubmed/22475995>

²⁸ National Collaborating Centre for Environmental Health. “Wildfire Smoke and Health.” Accessed September 2019. <http://www.nccch.ca/environmental-health-in-canada/health-agency-projects/wildfire-smoke-and-health>

²⁹ Henderson S., Johnston F. “Measures of forest fire smoke exposure and their associations with respiratory health outcomes.” *Current Opinion in Allergy and Clinical Immunology*. 2012 Jun;12(3):221-7. doi: 10.1097/ACI.0b013e328353351f. <https://www.ncbi.nlm.nih.gov/pubmed/22475995>

³⁰ Dodd, W., Scott, P., Howard, C. et al. “Lived experience of a record wildfire season in the Northwest Territories, Canada.” *Can J Public Health* (2018) 109: 327. <https://doi.org/10.17269/s41997-018-0070-5> <https://link.springer.com/article/10.17269/s41997-018-0070-5>

³¹ McCue, Duncan. Canadian Broadcasting Corporation. “Growing ‘ecological grief’ is the mental health cost of climate change.” October 21, 2018. <https://www.cbc.ca/radio/checkup/growing-ecological-grief-is-the-mental-health-cost-of-climate-change-1.4871666>

³² Hayes, Katie et al. “Climate change and mental health: risks, impacts and priority actions.” *International journal of mental health systems* vol. 12 28. 1 Jun. 2018, doi:10.1186/s13033-018-0210-6 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5984805/>

³³ Government of Alberta. Alberta Health, Health Standards, Quality and Performance Division. Analytics and Performance Reporting Branch. Health A. “Impact of Wildfires on the Mental Health of Fort McMurray Residents: Neurotic Disorders, Daily Physician Visits within an Emergency Department 2015 vs. 2016.” 2016. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5621945/>

³⁴ Government of Canada, Health Canada, Public Health Agency of Canada. “Science Narrative: Climate Change Impacts on the Health of Canadians.” April 2017. http://publications.gc.ca/collections/collection_2017/aspc-phac/HP5-122-2017-eng.pdf

³⁵ D’Amato, Gennaro et al. “Effects on asthma and respiratory allergy of Climate change and air pollution.” *Multidisciplinary Respiratory Medicine*. December 22, 2015. <https://doi.org/10.1186/s40248-015-0036-x>

³⁶ Government of Canada, Health Canada, Public Health Agency of Canada. “Science Narrative: Climate Change Impacts on the Health of Canadians.” April 2017. http://publications.gc.ca/collections/collection_2017/aspc-phac/HP5-122-2017-eng.pdf