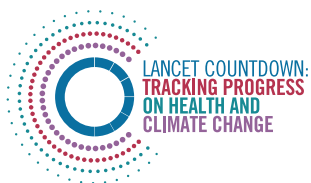


The Lancet Countdown on Health and Climate Change

Policy Brief for Canada

DECEMBER 2020



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Introduction

Previously described as “the greatest threat to health of the 21st century”, climate change is compounding existing health disparities in Canada. Given this, addressing the current climate crisis offers what is perhaps our biggest opportunity to improve the health outcomes of Canadians.

We see wildfires exacerbating respiratory illnesses and leading to community displacement in Western Canada; heat-related illness in urban areas; changes in the availability of traditional foods in the Arctic region; mental health stresses; extreme weather events such as floods and droughts; progression of infectious diseases such as Lyme disease and emergence¹. Moreover, climate change drives inequities: older persons, those of low socioeconomic status, and racialized people living in Canada face a greater burden of the impacts of climate change on their health.

In particular, climate change disproportionately impacts Indigenous peoples’ wellbeing. Colonialism has altered the ecological systems that support Indigenous peoples’ health, economies, cultural practices and self-determination. For First Nations, Métis and Inuit communities, the current climate crisis is understood and experienced as an intensification of the environmental changes imposed on Indigenous people by historic and ongoing colonial processes. Their remarkable and demonstrable resilience through these changes, however, reinforce

the opportunity for learning and collaborating on solutions that draw on the ecological traditional knowledge, social and environmental adaptability of Indigenous peoples in Canada.

This brief, written in collaboration with medical and public health experts, as well as Indigenous and allied scholars, outlines opportunities to address climate change. Based on data from the global Lancet Countdown report, it looks at the impacts of extreme heat and air pollution on the health of all people living in Canada. It also explores how, by applying a justice lens to all policies, Canada’s leaders can promote a healthy transition to a sustainable society in the dual crises era of climate change and COVID-19, including developing a more sustainable healthcare system and prioritizing health equity.

This policy brief presents updated information and recommendations on two major clusters of indicators of climate-related health impacts in Canada: extreme heat and air pollution. It provides six evidence-based policy recommendations for a healthy response to climate change through enhancing resilience and adaptability. We offer recommendations that aim to reap co-benefits for physical, social, economic, and environmental well-being. Additionally, as economies are slowly recovering from the COVID-19 pandemic, this brief acknowledges the unique opportunity to shift toward a carbon-neutral society, and these policy recommendations enable progress towards this goal.*

*Additional recommendations can be found in the 2017, 2018 and 2019 briefs.

Recommendations

Turn down the heat

1

Retrofit existing built infrastructure, improve current social and natural infrastructure, and better design novel urban and suburban communities to improve resilience to heat, especially for groups at risk.

2

Promote and be guided by the resilience of land-based Indigenous-led approaches that foster adaptation to rapid warming in Indigenous communities, particularly in the north.

Clean our air

3

Increase support for sustainable housing, including flexible strategies that financially and logistically support low emissions design and deployment of technologies for improved insulation and energy efficiency at the community and neighbourhood level.

4

Prioritise funding for low emissions transport and affordable public and active transport initiatives, targeting communities who could benefit most from access to healthy transportation and identifying examples of successful community initiatives.

The way forward: healthy recovery

5

Ensure a recovery from COVID-19 that is aligned with a just transition to a carbon-neutral society, considering health and equity impacts of all proposed policies to address the climate and COVID-19 dual crises, directly including and prioritizing the disproportionately affected, including Indigenous peoples, older persons, women, racialized people, and those with low income.

6

Strengthen health system resilience in the face of climate change and other current and future health threats, prioritising decarbonisation, energy efficiency, and improved waste management and supply chains, aiming at a nation-wide “net-zero health service”.

Turn down the heat

Canada is warming at double the global average rate, and even more rapidly in northern regions.² The number, intensity and duration of heatwaves are likely to increase, especially in southern Canada where most of the population lives.

Extreme heat is associated with increases in all-cause mortality; risks of being hospitalized for cardiovascular and respiratory diseases;³ and congenital and birth complications.^{4,5} High temperatures also affect psychological and emotional health.⁶ During extremely hot periods, interpersonal and group violence tend to increase, especially in underprivileged neighbourhoods. Domestic violence rises,

impacting the well-being of women.^{1,7} Additionally, extreme heat has been linked to insomnia;⁸ higher suicide rates;⁹ and an increase in mental health-related emergency department visits.¹⁰

Canada's aging population[†] is at higher risk of suffering from extreme heat because of frequent social isolation, less access to energy-efficient and heat-resilient housing, decreased ability to regulate body temperature, and higher prevalence of pre-existing chronic conditions such as hypertension, diabetes and heart disease. Between 2014-2018, rapid warming in Canada led to a 58.4% increase in average annual heat-related mortality for the over 65 population, compared to the 2000-2004 baseline, exceeding the global average of 53.7%.¹³ A record high of over 2700 heat-related deaths in the over-65 population occurred across the country in 2018.¹³ In the summer of 2018, two heat waves affected Quebec, with 86 excess deaths resulting from the first of these two heatwaves alone.¹⁴

Heat exposure also affects outdoor workers, including those in the construction, service, manufacturing, and agriculture sectors. In Canada, the work hours lost due to exposure to extreme heat was 81% higher on average in 2015-2019 than in 1990-1994, with an average of 7.1 million extra work hours lost per year.^{5,13}

In 2018, the monetised value of global heat-related mortality was equivalent to 0.7% of Canada's gross national income, compared to 0.2% in 2000.¹³ These costs are comparable to the average income of 263,400 Canadians, or roughly the population of Gatineau, Québec's 4th biggest city, or Saskatoon, Saskatchewan's biggest city.

Physical, social and economic structures contribute to heat-related death in people at risk. Older persons, outdoor workers, and those living in low income neighbourhoods often have less access to green spaces, public transport and proper insulation, or are more likely to be socially isolated or to live on a low household income. For Indigenous peoples, rising temperatures further exacerbate disparities attributable to colonialism, such as food security, access to clean water, land use, ice safety and housing stability.¹⁵ Addressing these inequitable structures will support individuals' and communities' resilience and productivity and decrease preventable health consequences as temperatures rise.

More sustainable infrastructure at community and household levels, such as trees and urban vegetation (including parks, on streets and 'green walls'), water features, and cooler buildings (which are lighter in colour or better insulated to reduce heat absorption), can better equip Canada to prevent these health consequences.¹⁶ However, infrastructure changes to mitigate the above mentioned health impacts, if only focused on design of new structures, may not be sufficient and new buildings also can incur significant costs in resources and energy demands. Retrofit of existing buildings offers an additional significant opportunity to increase energy efficiency, reduce cooling costs, and mitigate health risks, and has been studied in other countries.^{17,18,19} Policy responses to extreme heat can be tailored to the most effective scales and be flexible to local realities, including scope for design of new structures, greening, and improving ventilation and insulation of existing ones.

[†] Gender-based violence increases in times of acute disaster and crisis, including climate-related events such as flooding and wildfires, while at the same time, the services available to women, such as shelters and safehouses, decrease.

[‡] According to Statistics Canada, the proportion of the population over 65 is 17.7% and increasing to up to 30% in the next 50 years.

[§] This data is calculated with the conservative assumption of work being undertaken in the shade.

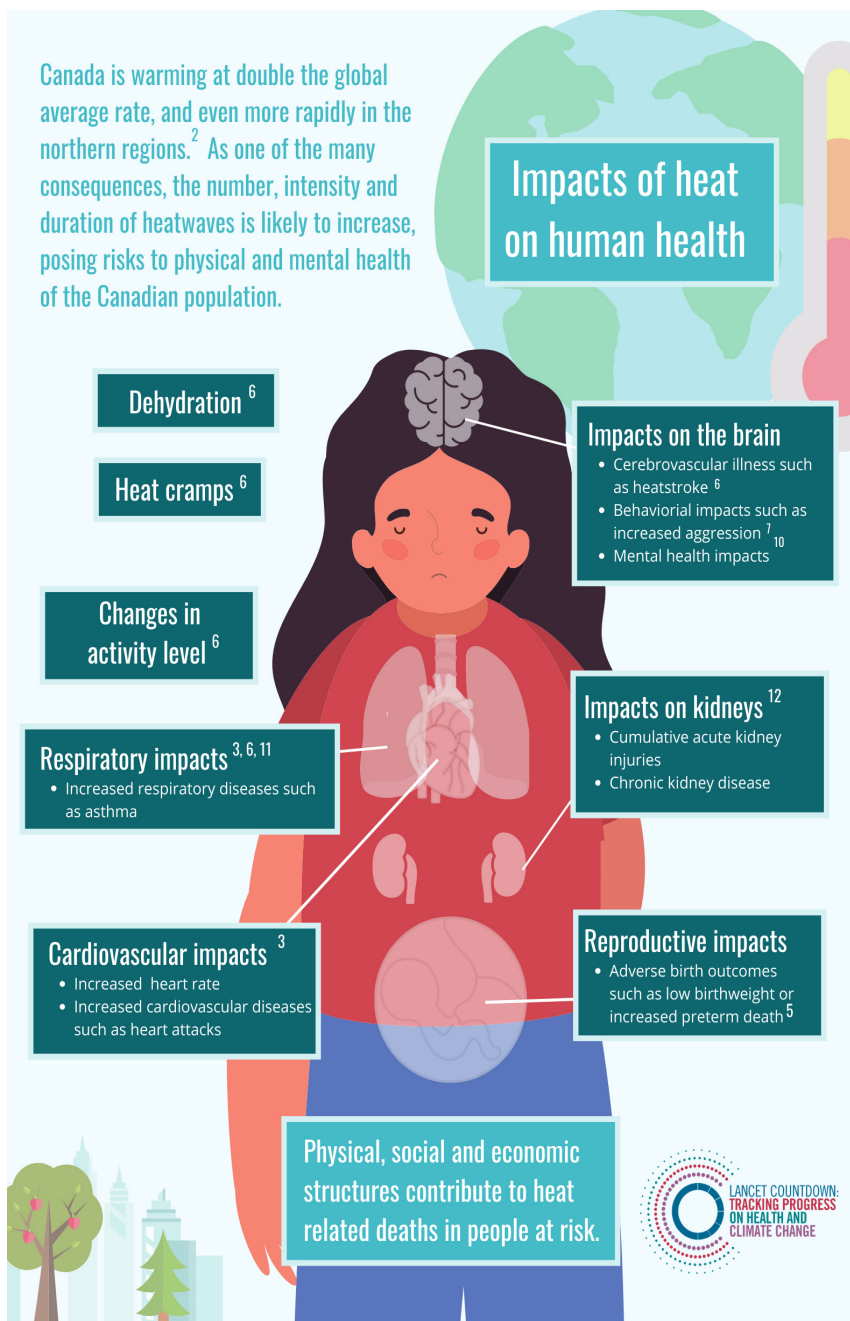


FIGURE 1: THE HEALTH IMPACTS OF HEAT^{3,5,6,7,10,11,12}

Clean our air

Air pollution has significant impacts on health, including exacerbating respiratory conditions like asthma and chronic obstructive pulmonary disease, and increasing risks of lung cancer, respiratory infections, stroke and heart disease. However, the burden of air pollution is not equally distributed across the population. Marginalized groups include children, older persons, people with pre-existing conditions, outdoor workers, racialized groups and low-income populations who are more likely to live in neighborhoods near busy roads or industrial sites.^{20,21}

In 2018 in Canada, there were a total of 8400 premature deaths related

to PM_{2.5} air pollution, of which 7200 were due to anthropogenic sources.¹³ Total PM_{2.5} air pollution related deaths were more than 4.5 times higher than the number of deaths from transport accidents, and almost double the number of deaths from all infectious diseases.²² While concerning, this number represents an opportunity to save over 8000 lives annually, and benefit the health of many others in Canada.

Transitioning rapidly to renewable, low-emissions energy can help achieve this. The largest portion, over 30% of deaths from anthropogenic air pollution, occurred due to emissions from households (e.g.

burning fuel for heating).^{13,23} Notably, 17% of anthropogenic PM_{2.5} air pollution related deaths were attributable to land-based transport,¹³ which in 2018 also accounted for 25% of Canada’s greenhouse gas emissions (an increase of 53% since 1990).²⁴ By reducing use of fossil-fuel based transport and home energy systems, including adapting existing systems to incorporate energy-efficient technologies, it is possible to decrease air pollution and improve health.

Total use of electricity for road transport increased 40% between 1990 and 2017.¹³ However, while Canada’s per capita use of electricity for road transport remains the highest use worldwide, it has increased only by 6.5% since 1990.¹³ Furthermore, electricity only accounts for 0.2% of road transport energy in Canada, whereas fossil fuels still account for over 95%.¹³ There remains large scope to increase uptake of sustainable transport and by doing so, save health and economic costs

Active transportation has significant health co-benefits, including due to physical activity, improvements in air quality, and social connection. Studies have found reductions of approximately 20-30% in premature mortality rates in those who regularly cycle or exercise for transportation.²⁵ Both active travel and public transit are associated with increased physical activity and reduced rates of obesity compared to car use, and when supported by infrastructures that prioritise safety and access, can benefit the well-being of those with limited access to private vehicles.²⁶ Transitioning to sustainable transport can avoid preventable transport-related emissions and deaths, and modelling has shown a cost-benefit ratio of more than 10 times in favour of integrating active travel for health and emissions benefits.²⁷

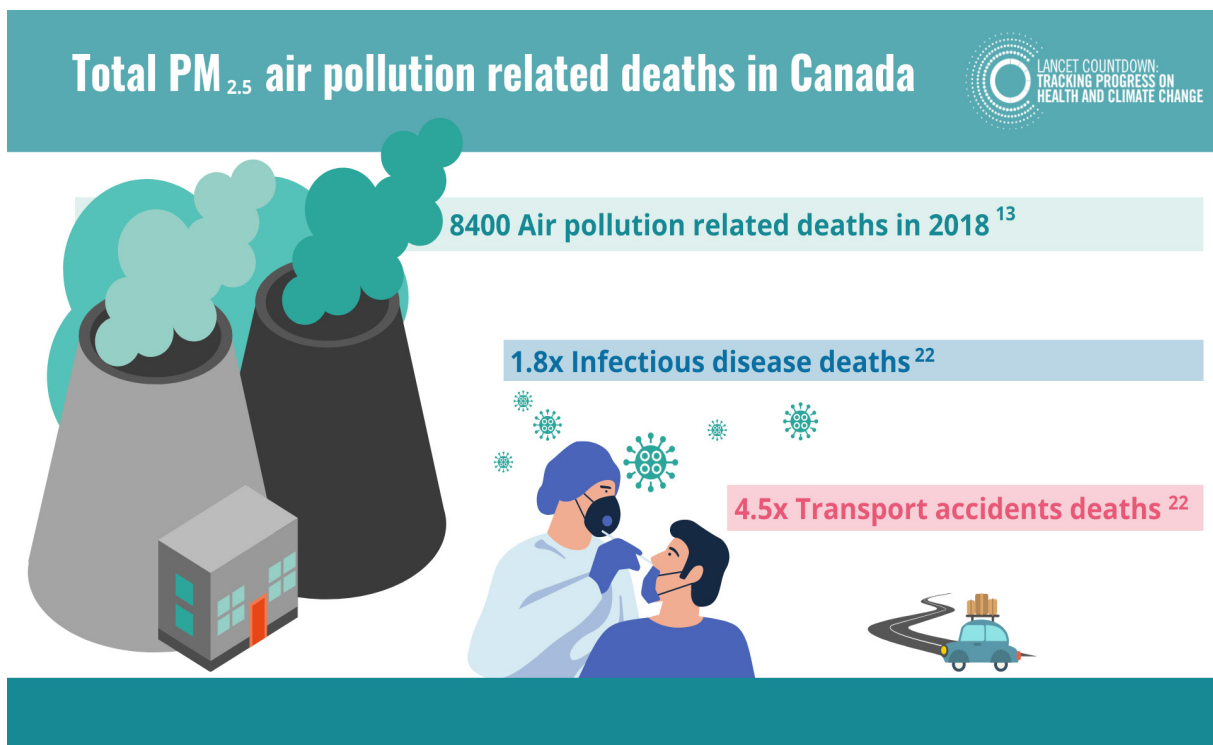


FIGURE 2: MORTALITY DUE TO PM_{2.5} AIR POLLUTION IN CANADA^{13,22}

The way forward: healthy recovery**

The COVID-19 pandemic, subsequent crash in global energy prices, and overall global economic downturn have cast doubt on the world’s ability to prevent catastrophic and deadly effects of climate change. While rates of emissions stalled early in 2020 due to COVID-19 lockdowns, the total concentrations of major greenhouse gases have continued to rise. This is in stark contrast to the 7.6% annual decrease in GHG emissions necessary to limit global temperature increases to less than 1.5°C.²⁸

An urgent transition to an environmentally sustainable, just and healthy society is an essential part of recovery that Canada and other countries must undergo. A just transition must include and prioritise groups most affected by the current crises, including low-income groups, migrant workers, older persons, and Indigenous peoples.

Furthermore, the COVID-19 pandemic has put immense strain on Canada's already overburdened healthcare system. Data from several sources indicates that Canada's healthcare sector was already responsible for approximately 5%^{13,29,30} of annual greenhouse gas emissions prior to the pandemic. Per capita, Canada's healthcare is consistently shown to have one of the largest carbon footprints in the world. In England, the National Health Service has pledged to deliver a net zero health service by 2040. Similarly, hospitals and health clinics in Canada could realise health and financial gains by committing to and implementing low-carbon, energy-efficient, reduced-waste health services.

Canada's political and economic choices as it emerges from this pandemic will determine whether it meets its commitment under the Paris Agreement to contribute to limiting global temperature rise well below 2°C. The country should lead by ambitiously updating its Nationally Determined Contribution (NDC) to the Paris Agreement¹¹. Ultimately, governments and all sectors of society must make choices that put human, environmental and economic well-being at the centre of a sustainable recovery from COVID-19. These objectives are not only mutually reinforcing, but mutually dependent. Crucially, Canada

must build resilience, equity and solidarity across groups, prioritising Indigenous peoples and other communities most at risk.

Above all, through the pandemic, it is essential to prioritise a just recovery: an equity lens must be applied to all policies. Those most affected by climate change's health impacts are those who currently lack power and representation in economic and social hierarchies. For Indigenous communities, addressing climate change is intimately tied to the renewal of traditional knowledge systems, reconciliation, and decolonizing approaches. All groups benefit when public and private sector leaders work with Indigenous people and other disproportionately impacted communities to ensure that historically underrepresented groups are meaningfully engaged in all policy development and recovery plans.

Working together, the lessons learned in responding to COVID-19 and the increasing confidence in the power of collective action to care for one another can be integrated into a collective response to the climate emergency. This is an unprecedented opportunity to learn and act together.

¹¹ There is a lack of data specific to impacts on health equity and on disproportionately affected groups, including Indigenous peoples. Furthermore, conventional scientific data collection and reporting methods do not align with traditional ways of accumulating and sharing knowledge, thus it is difficult to use current indicators to capture the complex health impacts of climate change on Indigenous peoples.

¹² As of October 2020, according to Climate Action Tracker, Canada's NDC is consistent with a global temperature rise above 2°C and near 3°C. This is not compatible with the 1.5°C of the Paris Agreement. Despite several promises to exceed the 2030 NDCs target (of 30% below 2005 emissions levels by 2030) and achieve net zero emissions by 2050, the federal government hasn't adopted yet the policies required to respect these promises and has continued to financially support the oil and gas industries. Source: <https://climateactiontracker.org/countries/canada/>.

References

- Howard, C et al. Lancet Countdown 2019 Policy brief for Canada. Lancet Countdown, Canadian Medical Association, and Canadian Public Health Association. November 2019. Available: <https://www.lancetcountdown.org/resources/>
- Bush, E. and Lemmen, D.S., editors (2019) Canada's Changing Climate Report, Government of Canada, Ottawa, ON. 444 p.
- Lin S, Luo M, Walker RJ, Liu X, Hwang S-A, Chinery R. Extreme High Temperatures and Hospital Admissions for Respiratory and Cardiovascular Diseases. *Epidemiology* 2009; 20(5): 738-46.
- Konkel L. Hot Days in Early Pregnancy: A Potential Risk Factor for Congenital Heart Defects. *Environ Health Perspect* 2017; 125(1): A25.
- Chersich MF, Pham MD, Areal A, et al. Associations between high temperatures in pregnancy and risk of preterm birth, low birth weight, and stillbirths: systematic review and meta-analysis. *BMJ* 2020; 371: m3811.
- Mon climat, ma santé. Online: Vagues de chaleur, Institut national de santé publique du Québec. <http://www.monclimatmasante.qc.ca/vagues-de-chaleur.aspx>
- Burke M, Hsiang SM, Miguel E. Climate and conflict. *Ann Rev Econom.* 2015; 7:577-817
- Obradovich N, et al. (2019). Nighttime temperature and human sleep loss in a changing climate. *Science Adv.* 2017.
- Burke M, et al. Higher temperatures increase suicide rates in the United States and Mexico. *Nature Climate Change.* 2018;8:723-729.
- Wang X, et al. Acute impacts of extreme temperature exposure on emergency room admission related to mental and behavior disorders in Toronto, Canada. *J Affect Disord.* 2014;155:154-161
- Xu Z, Crooks JL, Davies JM, Khan AF, Hu W, Tong S. The association between ambient temperature and childhood asthma: a systematic review. *Int J Biometeorol* 2018; 62(3): 471-81
- de Lorenzo A, Liaño F. High temperatures and nephrology: The climate change problem. *Nefrologia.* 2017;37:492-500
- Watts N, et al. The 2020 report of The Lancet Countdown on health and climate change: responding to converging crises. *Lancet* 2020; XXX: XXXX-XX
- Institut national de santé publique du Québec. Surveillance des impacts des vagues de chaleur extrême sur la santé au Québec à l'été 2018. INSPQ. Available online: <https://www.inspq.qc.ca/bise/surveillance-des-impacts-des-vagues-de-chaleur-extreme-sur-la-sante-au-quebec-l-ete-2018>
- Ford, JD (2012) Indigenous Health and Climate Change, *Am J Public Health*, 2012 July; 102(7): 1260-1266.
- C40. How to adapt your city to extreme heat. C40 Implementation Guides, August 2019. Available online: https://www.c40knowledgehub.org/s/article/How-to-adapt-your-city-to-extreme-heat?language=en_US
- Williams, K et al (2013) Retrofitting England's suburbs to adapt to climate change, *Building Research & Information*, 41:5, 517-531.
- Castleton H.F. et al (2010) Green roofs; building energy savings and the potential for retrofit, *Energy and Buildings*, 42:10, 1582-1591.
- Ren, Z et al (2011) Climate change adaptation pathways for Australian residential buildings, *Building and Environment*, 46:11, 2398-2412.
- World Health Organization. Online: Ambient air pollution: health impacts. <https://www.who.int/airpollution/ambient/health-impacts/en/>
- Abelsohn, A and D.M. Stieb. 2011. Health effects of outdoor air pollution. *Can Fam Physician* 2011 Aug; 57(8): 881-887.
- Statistics Canada. Table 13-10-0156-01 Deaths, by cause, Chapter XX: External causes of morbidity and mortality (V01 to Y89).
- National Resources Canada. 2015 Survey of Household Energy Use (SHEU-2015) Data Tables. Available online: <https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/menus/sheu/2015/tables.cfm>
- Environment and Climate Change Canada (2020) National Inventory Report 1990-2018: Greenhouse Gas Sources and Sinks in Canada.
- Giles-Corti et al (2010) The co-benefits for health of investing in active transport, *N S W Public Health Bull.* 21:5-6, 122-1277.
- World Health Organization (2012) Health in the green economy : health co-benefits of climate change mitigation- transport sector, WHO, 144p.,
- Chapman et al (2018) A Cost Benefit Analysis of an Active Travel Intervention with Health and Carbon Emission Reduction Benefits, *Int J Environ Res Public Health*, 15(5): 962.
- World Meteorological Organization (2020) Online: United in Science 2020: Greenhouse Gas Concentrations in the Atmosphere - Global Atmosphere Watch (GAW). Available: https://public.wmo.int/en/resources/united_in_science
- Pichler P-P, Jaccard IS, Weisz U, Weisz H. International comparison of health care carbon footprints. *Environmental Research Letters* 2019; 14(6): 064004.
- Eckelman MJ, Sherman JD, MacNeill AJ. Life cycle environmental emissions and health damages from the Canadian healthcare system: An economic-environmental-epidemiological analysis. *PLoS Med* 2018;15(7):e1002623.

Organisations and acknowledgements

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THE LANCET COUNTDOWN

The Lancet Countdown: Tracking Progress on Health and Climate Change is an international, multi-disciplinary collaboration that exists

to monitor the links between public health and climate change. It brings together 38 academic institutions and UN agencies from every continent, drawing on the expertise of climate scientists, engineers, economists, political scientists, public health professionals, and doctors. Each year, the Lancet Countdown publishes an annual assessment of the state of climate change and human health, seeking to provide decision-makers with access to high-quality evidence-based policy guidance. For the full 2020 assessment, visit www.lancetcountdown.org/2020-report.

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The Canadian Medical Association (CMA), formed in Quebec City in 1867, has led some of Canada's most important health policy changes. As we look to the future, the CMA will focus on advocating for a healthy population and a vibrant profession.