

Climate change and Canadian emergency medicine: Exploring alternative futures

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“It is worse, much worse, than you think” – David Wallace-Wells, *The Uninhabitable Earth Life After Warning* (2019)

Although climate change has been called *the greatest public health emergency of our time*,¹ there is little evidence of that concern in Canadian emergency departments (EDs). Even as Canadian emergency providers begin to feel the impact of climate crises firsthand – injuries from severe weather, heat stroke and heat-related cardiac disease, reactive airway disease exacerbations from smoke and allergens, and emerging infectious diseases – it is difficult for us to imagine what the future will bring.

There is a good reason Canadian emergency medicine has been late to respond to the climate crisis. We are too distracted by the problems of the present to focus on the problems of the future. EDs – our societal safety nets – are under pressure. National data reveal a system continually challenged to meet public expectations of efficiency, quality, safety, and experience.² What’s more, when we do look ahead, we struggle to see how climate change will effect our care delivery day to day. This is no surprise, as predicting the global response to climate change is as futurist Bob Johansen says “VUCA: vague, complex, uncertain, and ambiguous”.³

A Foresight futures-thinking tool called Envision Alternative Future offers us a solution. This framework explores plausible future scenarios, in order to extract insight and direct action.⁴ Using four archetypes – growth, collapse, constraint, and transformation – we can forecast different visions of global climate response to better understand the direct risks to Canadian emergency medicine. Scenarios are informed by *drivers* (large forces reshaping today into something new) and *signals* (small or local innovation with the potential to disrupt the status quo).⁵

Growth: *In this scenario, we extrapolate trends into a future with minimal disruption.*

Slow and insufficient international response to carbon pollution occurs despite widespread political pressure. A narrow focus on developing renewables (wind and solar) leads to ongoing fossil fuel use as energy needs grow. The goals of the Paris Accord are not met, and there is continued warming with a 3 degrees Celsius increase by 2100. In the immediate decades ahead, there is continued detrimental health effects from carbon-based energy, increasing mass immigration with more than 200 million people displaced before 2050, and normalization of floods, droughts, fires, heat waves, and hurricanes.

Collapse: *In this scenario, there is a rapid, catastrophic systems and infrastructure breakdown.*

Little or no international response to climate change transpires. Continuing increases in carbon emissions and carbon release from melting permafrost accelerate warming. Canada is immediately confronted with mass immigration, severe weather, and a depressed global economy. More than 4.5 degrees of warming occur by 2100, leading to heat death, mass hunger, dying oceans, unbreathable air, and armed conflict across the globe. Government funds initially used for foreign aid are quickly realigned for national defence.

Constraint: *In this scenario, a core guiding value or purpose organizes and governs behavior.*

An international effort to reduce emissions using economic policy emerges. Both “carbon tax” and “cap and trade” policies are implemented and then expanded worldwide in a decentralized and

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fragmented fashion. Progress is initially slow as governments grapple with carbon costing, but, with continued negotiation, a unified policy is eventually adopted by the United Nations and emissions are reduced to targets. The pace of adoption proves too lengthy to stop global warming, and the planet warms by 3.5 degrees by 2100. Natural disasters and agriculture loss significantly lower per capita GDP, and extreme poverty grows by hundreds of millions by 2050.

Transformation: *In this scenario, society or systems fundamentally change or reorganize around a new paradigm.*

A rapid, international adoption of nuclear energy unfolds offering an immediate elimination of carbon emissions. The existential threat of climate change is deemed far more dangerous than that of deploying nuclear power. Standardized design and repetitive building limit costs, but large capital investments, are still required by wealthy countries. Emission targets are met ahead of schedule, and global warming is held to 2 degrees Celsius. Energy is abundant and a return on investment is realized.

The unifying insight of these scenarios should be carefully considered. The true threat to public health and emergency medicine in Canada is *the diversion of funding*. In each scenario, climate change reorganizes and reprioritizes how we spend public and private funds. Healthcare spending, which is already growing at an unsustainable rate,⁶ will be further jeopardized. There is little doubt that Canadian EDs will be impacted directly and indirectly by these changes in the next two to three decades.

How will a 20% decrease in budget impact the staffing in your ED? How will care delivery in your ED adopt to fewer community resources or fewer primary care physicians? How will trainees view a future career in Canadian emergency medicine?

The World Health Organization has called on health authorities to prepare for climate change risks by

building climate resilient health systems.⁷ EDs must be a central part of any national climate change stress testing and capacity building. Canadian emergency medicine providers are similarly essential in crafting strategies and policies that confront resource inadequacy. We must use our unique position to better advocate and reframe climate change as a public health issue to mobilize action.⁸ We must come together as a community of practitioners, academics, and leaders to engage with purpose and with haste.

Climate change is much, much worse than we think. We are not ready.

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