

Executive Summary

On January 19, 2021 speakers from Canada and abroad came together to speak about current and future opportunities of a circular economy in Northern Ontario. A circular economy refers to a system that reduces waste by reusing material in the creation of new products.

Dr. Gary Bota, who is the Chair of the Climate & Health Taskforce at the Northern Ontario School of Medicine, as well as the Chair at CAPE-ON, discussed the circular economy and climate change in the context of health. From his presentation, several key considerations arose:

→ Climate and health are tightly linked. There are multiple external factors that play a role in one's health. However, due to changes in the climate, we are seeing consequences such as an increasing number of people with allergies, more children with zinc and other deficiencies, more heat-related illnesses and so on.

→ The healthcare industry produces a lot of waste. For example, about 26 pounds of waste per day per patient is produced. About 30 per cent of this gets recycled, 60 per cent goes into the garbage, and about 10 per cent is biological waste, and it usually gets incinerated.

→ There are ways to reduce waste in the healthcare industry. A local example is an anesthetist in Sudbury looked at the anesthetic gases used for patients and was able to rid of a greenhouse gas that was particularly bad. The result of removing one gas like that is the equivalent, at one hospital, of driving three million kilometers per year.

→ Education is key and healthcare professionals play a role in this process.

Bota's explanation of the linkages between circular economy and health are relevant to those living in Northern Ontario. Climate change, whether it is seen through changes in disease, higher temperatures, or forest fires, directly impacts the health and wellbeing of people. Planetary health, or the declining of such, leads to declining social and environmental determinants of health. This means that as our carbon footprint grows and the health of our environment suffers, the health of Northerners declines as well.



Chair of the Climate & Health taskforce at NOSM and Chair of CAPE-ON

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Purpose

This commentary was transcribed from a presentation Dr. Gary Bota gave on January 19, 2021, at the online Northern Ontario Circular Economy Symposium event. The editor has adapted some of the text for the sake of structure and narrative. The presentation is viewable on ParlAmerica's YouTube channel.

The event aimed to explore current and future opportunities of a circular economy in Northern Ontario, which refers to a system that “aims to gradually decouple growth from the consumption of finite resources” (Ellen MacArthur Foundation n.d.) — in other words, reducing waste by reusing material in the creation of new products. By doing so, we can create more self-sustaining communities, produce more jobs, become our own supply chain, and reap benefits across Ontario's northern regions.

“ In the end, the term ‘circularity’ may just be one way to make us aware that we need a more encompassing, integrated and restorative sustainability path that includes people as much as technology and nature. ”

- Michiel Schwarz, A Sustainist Lexicon



Health Innovation

Let's start with a few stories.

Having been an emergency physician for the last 38 years, I've got lots of stories. These are some of the tame ones, but I'll give them anyway. About six years ago, I was working a shift in the emergency department and a young gentleman came in with unusual symptoms and a rash that I'd never seen before. After doing some chatting with colleagues, it turned out it was the first case of Lyme disease I had seen here in my Northern Ontario city of Sudbury.

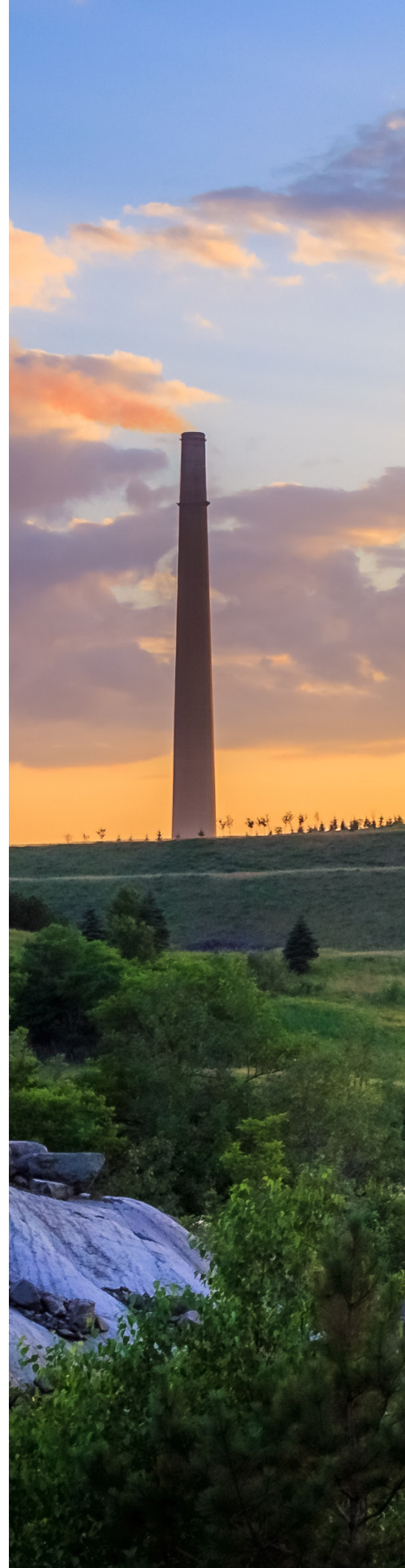
In 2016 I was out for a hike on our local trails behind Laurentian University. It was a hot summer day and, as you may or may not know, 2016 along with 2020 were the two hottest years that have been recorded globally. I came across a woman standing over her partner. They'd been out for a hike, he had gotten confused and collapsed where I found him lying unconscious on the ground. It took us about two hours to get paramedics into the area and get him out of that location.

A couple years after that, in 2018, we had a particularly large forest fire in our region — the Parry Sound 33 fire. Throughout the course of that summer, while the fire raged, we saw an unprecedented number of patients presenting to our emergency department with asthma attacks, and this included children — particularly children from some places that had recent fire events and actually were running out of inhalers. Even once the fire was over, people were coming in with mental health problems, severe anxiety, sense of loss — they'd lost their places that they'd had forever, their homes and such.

This past summer, my wife and I had the opportunity to visit one of our children in Vancouver for a week. At the end of the summer, there were unprecedented forest fires taking place on the west coast from California through Oregon. The smoke was coming up the whole west coast because of that.

COVID-19 has been, on top of all these things, incredibly disruptive over the past several months.

So, what do all these stories have in common? They're all related to climate change. Starting in the North, we've found that food patterns have changed, winter travel patterns have changed, hunting has changed on the west coast and in Ontario and elsewhere. We're having increasing numbers of wildfires, causing asthma, evacuation from homes, and exacerbation of other diseases across the West. We've had unprecedented



floods and the damage associated with those, and droughts that are affecting crops and the yield from crops — the micronutrients in crops are starting to fall. Kids are getting zinc and other deficiencies. We're seeing more people with allergies; the pollen season's getting longer. When you have a flood, we're getting a lot of flooded basements, a lot of disease related to that. As I mentioned, we're seeing tick-borne diseases now at higher rates than we've ever seen them. Heat-related illnesses — my collapsed person on the trail, he was a heat stroke victim, and every year now we're having two to three thousand people affected by heat and dying from heat in this country alone.

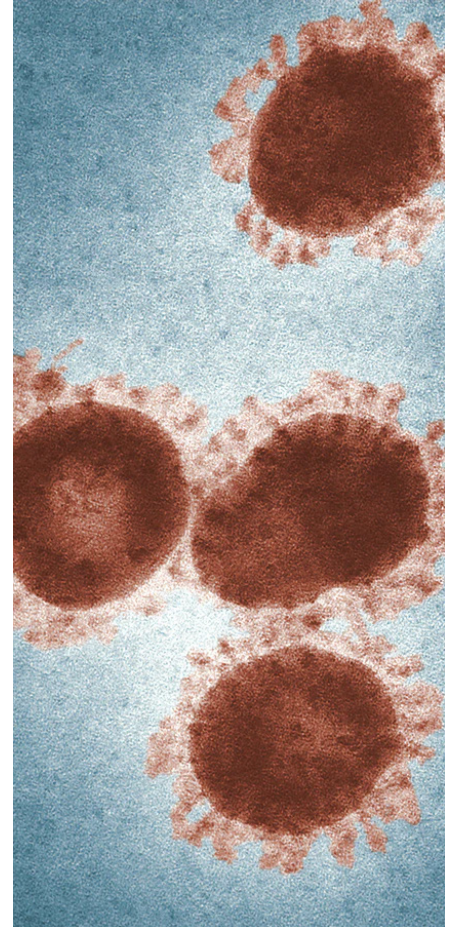
So, lots of health problems related to climate.

I'm going to take a minute and talk about the concept of planetary health. In the past, we always thought about health as human health, but what we're finding now is we really live in a nest that depends on the environmental determinants of health. We need clean air, we need clean water, we need clean food, and we need a stable climate. If we have all those things in operation, then we can build up our society, what we call our social determinants of health. We can create an economy, we can create education, we can create good housing and food and social justice If everything's working well, we can do really advanced things like build sophisticated health care systems. And we've done that. The problem is, our nest is starting to crack.

Why is this happening? Well, I think we really have to remember that we've lived in an environmental sweet spot for the last 11,000 years since the start of the agricultural revolution. What's happening now is we're not at 1.1 degrees Celsius anymore. This year the globe hit 1.2 degrees Celsius above the temperature in pre-industrial times. In Canada, it's going up even faster. In the Far North, it's going up three times as fast. That's a steep curve. Why is this happening? Well, as you know, to paraphrase James Carville: "It's not the economy, stupid; it's the carbon, stupid."

Over the last one million years, carbon dioxide levels have fluctuated but stayed relatively stable. However, in the last 100 years, the levels have experienced a drastic increase. Quite frankly, if I saw vital signs that look like that in a patient, we'd be calling an emergency. We would be doing everything we could to try to change the slope of that curve. So, at the end of the day, what we're thinking more and more in medicine is that climate change really is the biggest global health threat of the twenty-first century. COVID-19 has been bad but, really, COVID-19 is nothing compared to what we're seeing from climate, even starting now.

Fortunately, climate change is also the biggest global health opportunity of the twenty-first century. If we create clean energy, our asthma rates go down, our heart disease rates go down. If we create



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a sustainable and active transportation system with walking and biking, we know that the incidence of diabetes goes down again, heart disease goes down, obesity goes down, and the same applies with creating a sustainable food system and healthy diets. If we do all these things right, we're going to have to spend less on health care, and that more than makes up for the cost of transitioning to a clean society.

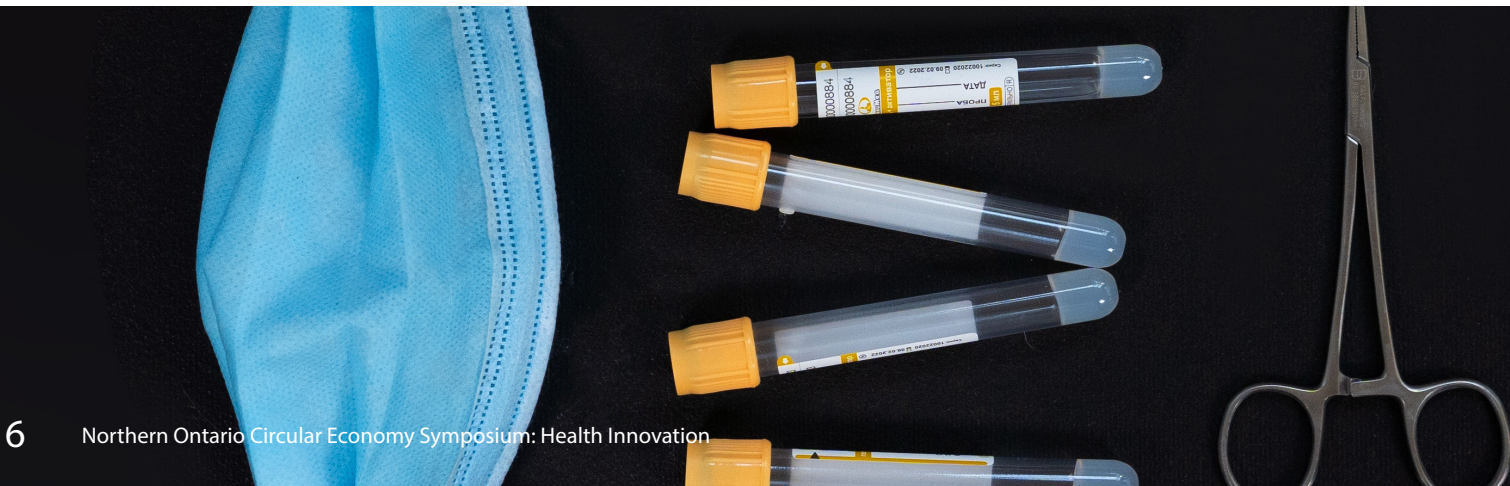
Where does health care actually come into this? Well, we have a high level of health care, based on the health care access and quality index, but we spend a lot. In Canada, there's about 1,200 kgs of CO₂ created per capita to run our health care system. We create a lot of waste in our health care system as well: about 26 pounds of waste per day per patient. About 30 per cent of this gets recycled, 60 per cent goes into the garbage, and about 10 per cent is biological waste, and it usually gets incinerated.

So, where does all this come from? Well, the country doing the most on this right now is the UK. The UK, through its national health system, has decided that it is going to reduce its waste and carbon footprint by 80 per cent by sometime between 2028 and 2032. They're not entirely sure how that's all going to happen, but they're starting to measure, and what they're finding is that, within the national health system — and Canada is fairly similar — waste and water account for about 5 per cent of particular gases in the operating room.

There's a lot of travel we do now, both of patients and staff, and so, as we transition to virtual care, which we're starting to do in some instances, we're going to have an impact there. However, fully 60 per cent of our carbon emissions in the health care sector come from the supply chains, and these supply chains are extensive and worldwide. Drugs account for a surprisingly large amount of our carbon footprint through their manufacture, distribution, and so on.

So, a couple of quick stories. We have to look at what we're disposing of, how we're procuring things, and what our values are around this.

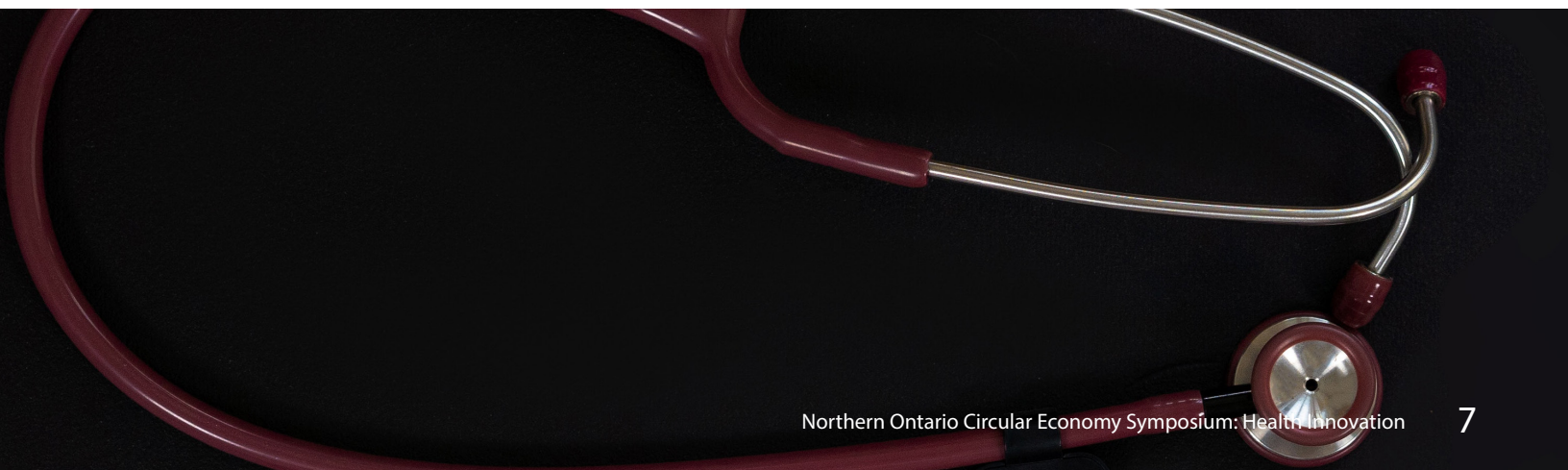
“ We create a lot of waste in our health care system as well: about 26 pounds of waste per day per patient. About 30 per cent of this gets recycled, 60 per cent goes into the garbage, and about 10 per cent is biological waste ”



An interesting local story. There's a physician, Dr. Mathur. He's an anesthesiologist at our hospital, and he started looking into the drugs they used to put patients asleep and the various volatile anesthetic gases that get used. Turns out one of them is a particularly nasty greenhouse gas. Does it offer any advantages? Some people thought so, but the advantages that gas adds to any patient's outcome are really minor. So, through his education and advocacy, the local hospital has just about gotten rid of that gas. The result of removing one gas like that from the system turns out to be the equivalent — at one hospital — of driving three million kilometres per year. So, you can make huge differences by looking at what you're using — in this case, anesthetic gas-wise. Now, are there other ways of handling it? Yes, some places are taking those same gases and, again, through the circular economy lens, scrubbing those gases, cleaning them, and reusing them.

“To have sustainable health care, we need less waste and more health.”

To have sustainable health care, we need less waste and more health. More information is coming out about that, but we need more education around this theme. Fortunately, we do have a Canadian coalition of green health care. They do put out an annual green hospital scorecard, and there are winners in the areas of energy, leadership, and waste, among others. We know we need rapid social change. To move from business as usual to a decarbonized state, we need more social tipping points. We have our FFF students out there, but we need educated health care individuals helping, because health care workers are trusted messengers, and we can help you and virtually all industries get through this. So, let's all work together. We've got lots to do. There are lots of things we can do within health care, and health care workers can do a lot to help you as well.



Work Cited

Ellen MacArthur Foundation. n.d. "The Circular Economy in Detail." Available online at <https://www.ellenmacarthurfoundation.org/explore/the-circular-economy-in-detail>.

Schwarz, Michiel, Riemer R. Knoop, and Joost Elffers. 2016. A sustainist lexicon: seven entries to recast the future - rethinking design and heritage.

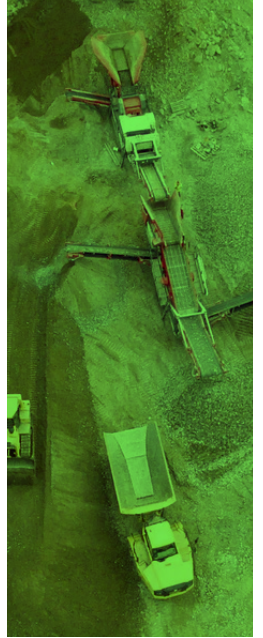
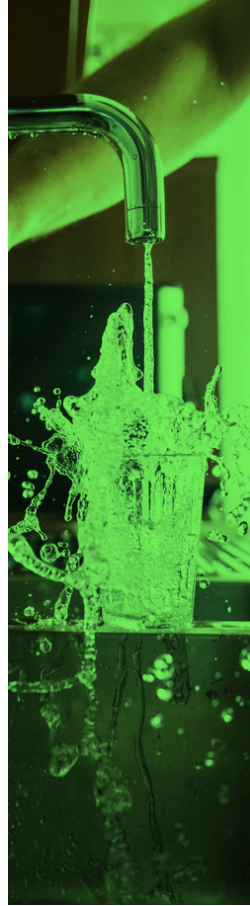
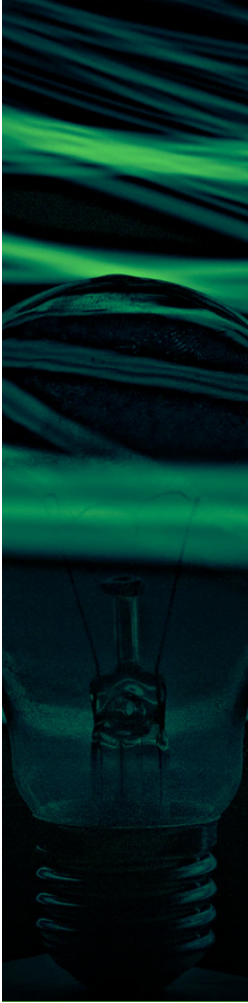
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