WHAT IF . . .

We fail to curb climate change?

It bears repeating that the future of medicine is almost exclusively the domain of the unknown. But here's one thing we do know without any shadow of uncertainty: Climate change is an urgent problem, and it's an urgent problem right now.

Consider the scientists. It's well-known that scientific consensus, especially around problems as massive and multifaceted as climate change, is rare. It's rare by design, baked into the operating framework within which scientists work. But on this topic, that consensus is now inarguable. Speaking on a podcast recently, Elizabeth Kolbert, a journalist whose book *The Sixth Extinction* won the Pulitzer Prize in Nonfiction in 2015, talked about how diligent these scientists are in separating the signal from the noise in their data—in figuring out what lies outside the scope of natural variability.

"They are extremely conservative. This is one thing I cannot emphasize enough," she said. "The dialogue around climate change is just completely insane and will go down as world-historically stupid and damaging and disastrous. Words fail me." Some who recognize the state of affairs have been beset by fear and anxiety, a condition that has been unofficially labelled "pre-traumatic" stress. Climate scientists themselves appear to be especially prone.

What does this mean for Canadian family doctors? The chances that a despondent climate scientist may one day land in your office are slim, but you will see others like them, and more of them. But more importantly, this slow-motion catastrophe will touch primary care in ways that are going to become more unnerving. You already know sea levels are rising, ice caps are melting, infectious diseases are spreading to new latitudes, and that storms have increased in both frequency and intensity. All of that is horrible, but it likely remains a kind of abstraction, too difficult to connect to your life as a physician.

Other parts hit closer to home. The medical supply chain in many parts of the world, including in Canada, is reliant on single sources of manufacturing for medication, supplies, etc. When hurricane Maria hit Puerto Rico last year, it crippled one of the world's largest manufacturers of sterile saline bags, resulting in widespread shortages and price hikes of over 600%.

Air pollution is linked to over 20,000 preventable deaths a year in Canada and 620,000 primary care visits. Those numbers will get worse before they get better. Doctors in B.C. and Alberta are already familiar with asthma exacerbations and similar ailments provoked by the smoke that blanketed huge parts of the western provinces during 2018's record-breaking fire season, which itself followed a record-breaking season in 2017.

Then there's the heat. Even at the low-end projections of two degrees of warming (a limit the signees of the Paris Climate Accords have now all but acknowledged we will blow past), cities like Karachi and Kolkata will regularly experience paralyzing heat waves. If we get to four degrees, a 2012 report from the World Bank suggests that a "normal summer" will look a lot like the European heat wave of 2003, which killed as many as 2,000 people per day. If we get to six degrees, temperatures in places like Toronto will exceed those in the hottest places on the planet and in *those places* it will be hot enough for hyperthermia to kill people in their sleep. A July 2018 modelling study published in *PLOS One* suggested that, in Canada, we could see a five-fold increase in heat-related deaths in the 50 years after 2030 compared to the 50 that came before.

Not to mention the world economy, the oceans, or the geo-political tensions that arise as a result of these factors. There will be more intense droughts. There will be more crop failures. There will be more armed conflicts as certain groups of people without access to sufficient resources grow more desperate (as happened in Syria's civil war). The effects of those conflicts will be felt in Canada (just as the one in Syria has been). There is scarcely one aspect of human life that is untouched by this phenomenon.

To reiterate, these are projections, but there is enough evidence to suggest they will come to pass barring a dramatic shift in the way our carbon-powered world operates. Other scenarios are less likely, based on too many unknowns, but still present a credible risk and doctors should be aware of them.

For instance, we know that the range of certain infectious diseases will continue to change, but we don't know whether the makeup of those pathogens might change. In 2016, in the Russian tundra, one person died, 115 were hospitalized and another 2,000 reindeer were infected with anthrax. The bacteria was traced to the carcass of a reindeer which emerged from the permafrost after it had been encased there decades earlier. In Alaska, researchers discovered remnants of the 1918 flu, which killed up to 100 million people.

"Experts caution that many of these organisms won't actually survive the thaw," David Wallace-Wells wrote last year, a tiny sliver of comfort in an otherwise harrowing story for *New York* magazine. "(But) there are now, trapped in Arctic ice, diseases that have

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not circulated in the air for millions of years—in some cases, since before humans were around to encounter them." To say primary care would be unequipped to deal with them seems, in all likelihood, to be understating things.

You might say this sounds alarmist, but alarm is warranted. There are doctors who feel that this—what the World Health Organization called the greatest threat to human health of the current century—is someone else's problem. They believe it will never touch their practice. That may be true, thankfully, but there will be many more doctors in the future who will be less lucky. Parts of their reality will be unrecognizable to us who are responsible for it.

"It takes 40 years or more for the climate to react to the carbon dioxide and the methane we emit," wrote *N+1* editor Chad Harbach in 2006. "This means that the disasters that have already happened during the warmest decade in civilized history (this one) are not due to our current rates of consumption, but rather the delayed consequences of fuels burned and forests clear-cut decades ago, long before the invention of the Hummer."

Fixing this is less simple. There is one reason climate change has been politicized: Because the most immediate solutions are political. Absent some technological, carbon-capturing godsend, dialing back and eventually ceasing emissions will require massive political mobilization, new laws, spending, taxes. It'll require international, cross-party support and clear-eyed leadership. It will look very much like the war efforts of the 20th century.

Moreover, it's been done. The U.K.'s Climate Change Act sets legally binding targets for greenhouse gas emissions at five-year intervals, and it's approaching its 10-year anniversary. Between 1990 and 2016 the country has reduced its greenhouse gas emissions by 41% (Canada's emissions, by contrast, have gone up 16% in that period—over 100 megatonnes).

Such massive efforts might sound unappealing, even scary. But we can say, with a degree of scientific certainty, that the alternative is far worse.

—TRISTAN BRONCA