

How accurate is our picture of the pandemic?

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More than a month into Canada's lockdown, physical distancing measures appear to be paying off. Hospitals have not yet seen the expected surge in coronavirus disease 2019 (COVID-19) cases and plans for the next phase of Canada's response are underway. Yet, it remains difficult to get a clear picture of the pandemic, and the United States' recent move to defund the World Health Organization (WHO) presents new challenges.

CMAJ discussed these developments with infectious disease specialists Dr. Srinivas Murthy of BC Children's Hospital and the University of British Columbia in Vancouver, Dr. Matthew Oughton of the Jewish General Hospital and McGill University in Montreal, and Dr. Alon Vaisman of the University Health Network in Toronto.

CMAJ: United States President Donald Trump announced he would stop funding to the World Health Organization. How will this impact the global response to the pandemic?

Murthy: I'm not sure he can legally pull funding [without first going through Congress], but if he could that's a huge problem. The World Health Organization is the only agency that has the job of coordinating public health across countries and in much of the world it's the only public health body, so to pull funding when it's needed more than ever — an editor of *The Lancet* called it a crime against humanity. Without supporting everyone to get through this, we're not going to get through this.

Vaisman: For developing nations, who rely on WHO for guidance documents, on the ground experts, deployment of resources, and assistance with surveillance, this may have a significant impact. Containment in these countries will be challenging. Furthermore, data from these nations may become sparser and less reliable.

Oughton: The consequences of widespread infection in developing countries will inevitably return to affect the wealthier countries, including the United States, on several important levels, including their population health and economies. If the withholding of funding to WHO leaves it unable to effectively function in resource-limited areas, then an alternative organization will need to be quickly formed to do so.

CMAJ: What has surprised you about how the outbreak is playing out? What should we make of the fact that predictions of a surge in hospitalizations and intensive care admissions have not yet been fulfilled?

Oughton: Our hospitals seem to be weathering the storm, while our long-term care facilities have become the new epicentre for

COVID-19 in Canada. This virus is unfortunately adept at exploiting the weaknesses in our social fabric; the combination of [care home] structures in which physical distancing is difficult or impossible, staff lacking adequate personal protective equipment and training in how to don and doff it correctly, and the risk factors present in the residents of [long term care] facilities have led to a high incidence of COVID-19 cases and deaths.

Vaisman: The fact we are not seeing our acute care facilities overwhelmed to the degree that other regions in the world have is a pleasant and welcomed surprise. It speaks to the power of public health measures to slow the spread of the disease. By most accounts, we are currently experiencing the peak of the first wave of the pandemic across the world and in most provinces in Canada.



The curve of Canada's outbreak may be bending, but gaps in data infrastructure complicate predictions.

Murthy: Two weeks ago, we were talking about surges, about ventilator rationing, and now we're talking about how and when we reopen and what we need to have in place for that to happen safely. The sacrifices we've all made to stay home have worked to a certain degree... though it's still possible we'll see a surge [as Canada eases restrictions]. In Singapore and other parts of the world, we're starting to see case counts increasing again as they've started to loosen up a bit on physical distancing.

CMAJ: There is increasing skepticism about the numbers out of China and the United States, and some have criticized the modelling predictions released by Canada's federal government as "largely unscientific." What do you think about the accuracy of different countries' modelling predictions and reporting of cases and deaths?

Oughton: Predictive models are inherently inaccurate, but they are nonetheless helpful in preparedness. A good analogy is weather forecasts; they may not perfectly predict the timing of every rain shower, but they will give you a good idea of whether you should bring raincoats and umbrellas... For the public, I think they help in explaining unfamiliar concepts including exponential spread and physical distancing; for managers and politicians, they help with planning logistics and resource allocation.

Vaisman: The often-quoted figure of 30%–70% of Canadians (or the world)

being infected may seem inaccurate now, especially with numbers stabilizing or declining, but because no vaccine has yet been released, we may reach these numbers over the course of months or years. The virus will continue to spread across the globe, albeit at a slower pace due to restrictions, but could very well infect a high proportion of people by the end of pandemic. The key factors that will dictate whether this will happen are an effective vaccine, whether reinfection is possible, and whether the virus has a seasonal pattern.

Murthy: The fundamental flaw in our Canadian health system is our ability to collect really coordinated data across the country. Different parts of the country have their own data registries, but federal or national data sets do not exist... so we can't pool all our national data together. If you look at the United Kingdom, they come out with weekly reports about case counts and descriptions and risk factors for mortality, hugely valuable data the rest of the world is learning from, and Canada is nowhere close to that.

CMAJ: Ottawa is in talks with the provinces about reopening the economy in phases and, south of the border, Trump has released a gradual plan for states to lift restrictions. What should "returning to normal" look like?

Oughton: The key factors required for Canada before it can safely begin to relax restrictions on regular activities are rapid, accurate, and widespread diagnostic testing in conjunction with rapid contact tracing

through public health authorities. One of the major determinants that we still do not understand is to what extent asymptomatic infection exists and to what extent it provides long-lasting immunity. If asymptomatic infection is widespread and provides long-lasting immunity, this will greatly reduce the risk of having large subsequent waves of COVID-19; if not, then we will require close monitoring and contact tracing until an effective vaccine is used to create that herd immunity.

Vaisman: It will be hard to envision a complete return to normal any time soon... In health care, a backlog of surgeries will need to be addressed by allowing the most urgent surgeries to proceed first, those that must be done to prevent inpatient admission. Surgical teams use scoring systems to help them guide their decisions. Other fields will need to come up with consensus guidelines on how to proceed in the same step-wise fashion.

Murthy: This is uncharted territory... so we'll have to figure it out and learn from other countries as we go. In an ideal world, we would do this in a scientific way and do randomized studies as we reopen — studies of some schools reopening, or some cities reopening and others not — tracking infection rates and sharing that knowledge globally. ... The next week or so in Singapore will be very useful to watch because if their case counts are resurging that's going to be a discouraging sign to us [suggesting] that reopening might be premature.

Lauren Vogel, CMAJ