COVID-19 IMMUNITY TASK FORCE

GROUPE DE TRAVAIL SUR L'IMMUNITÉ FACE À LA COVID-19

AUGUST
2022

CITF MONTHLY REVIEW

The impact of the **Omicron tsunami** on Canada

Where is the **pandemic headed** come the fall?

Vaccination and **immunocompromised populations**

The Omicron tsunami:

Data analysis suggests over 17 million Canadians were infected with Omicron in only five months

> Omicron has been a **tsunami**. New sublineages in the Omicron line continue to spread, and the percentage of Canadians who have had a SARS-CoV-2 infection is now likely well **above 50%**.
>
> – CITF Executive Director **Dr. Tim Evans**

A data synthesis from 21 CITF-funded seroprevalence studies found that:

- Five months into the Omicron wave, by May 31, 2022, nearly **56% of Canadians** had been infected with SARS-CoV-2. This compares to 5% of Canadians with infection-acquired antibodies in the pre-Delta wave.
- The CITF's analysis of data, therefore, shows **17 million Canadians** had an Omicron infection between December 2021 and May 2022, for an average of more than 100,000 infections per day. That's more than 10 times the number of daily cases seen during the previous peaks of SARS-CoV-2 waves.
- Seroprevalence due to infection **increased steeply in all provinces**.
  - By the end of May, infection-acquired seroprevalence was approximately 50-60% in Western and Central provinces (British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec).
  - Although Atlantic Canada (New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador) retained the lowest seropositivity due to infection, the region had the largest relative increase, reaching a seroprevalence of over 35%.

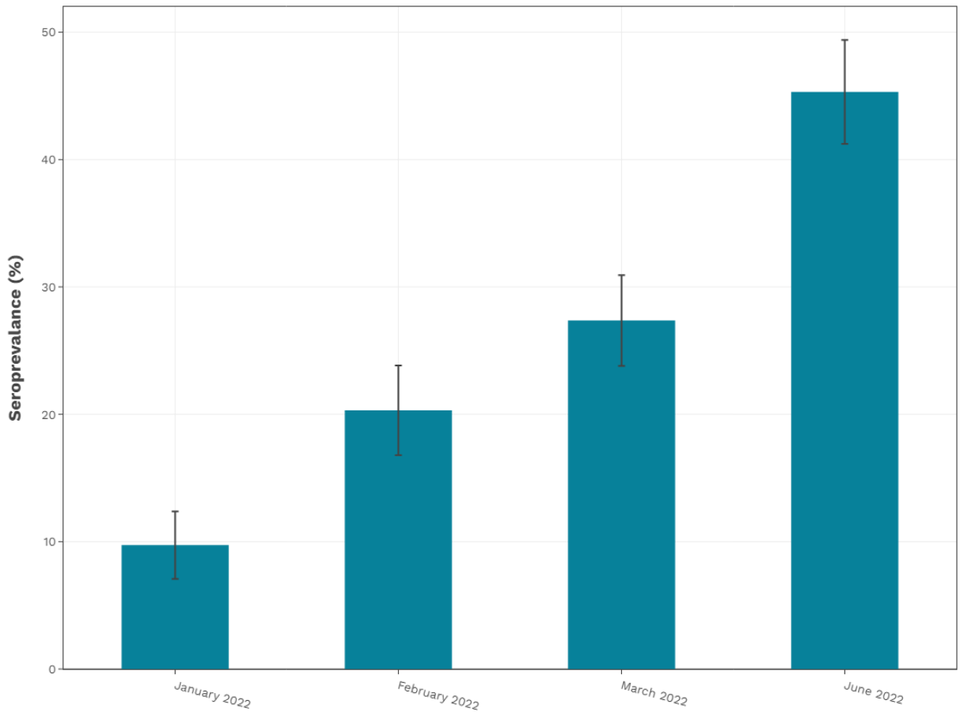
- Seroprevalence due to infection **increased steeply among all ages** during the Omicron wave but the increase was steepest amongst younger Canadians: the highest levels were observed among young adults (aged 17-24) with about 65% being seropositive. Seroprevalence tended to decrease with increasing age: 25-39 (56%), 40-59 (47%), and 60+ (29%).

The CITF remains focused on data synthesis and will make the highlights publicly available on an ongoing basis via its website shortly.

» READ THE NEWS RELEASE **» READ THE FULL REPORT**

JUNE REPORT

Young adults remain the primary vector of SARS-CoV-2 transmission



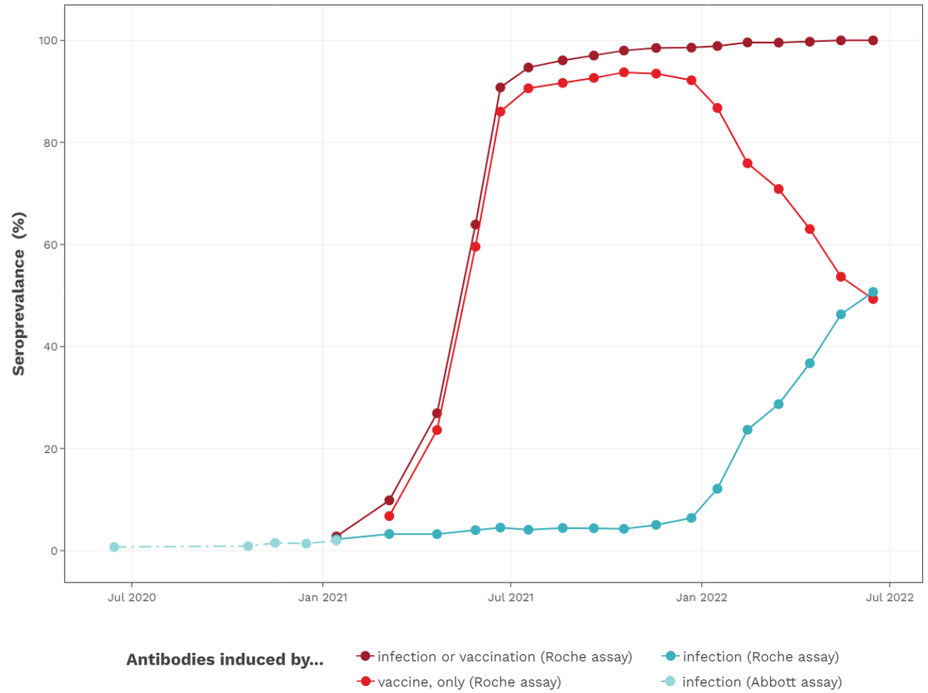
The latest serosurvey conducted by Héma-Québec estimates that 45.3% of adults in Quebec developed infection-acquired antibodies to SARS-CoV-2 between December 2021 and June 2022, up from 27.3% in mid-March 2022.

Antibodies against the nucleocapsid (N) protein of SARS-CoV-2, which is indicative of a previous infection, was highest among younger individuals (18-25 years, at 72.1%) and lowest among older individuals (>65 years, at 30.2%). This suggests that young people remain the primary vector for SARS-CoV-2 transmission in the province.

» READ THE SUMMARY » VIEW INTERACTIVE GRAPHS

JUNE REPORT

Seroprevalence increases again in June but stabilizes throughout month



With the continued transmission of the Omicron variant in Canada, infection-acquired seroprevalence increased again within the blood donor community, from 46.3% at the end of May to 50.7% by the end of June. However, it was relatively stable throughout the month.

An increase in the concentration of vaccine-induced (anti-S) antibodies in those over 60 was observed in May and continued into June, most likely due to high uptake of fourth doses within this older age group. Almost all the blood donors were still positive for vaccine-induced (anti-S) antibodies.

» READ THE SUMMARY » VIEW INTERACTIVE GRAPHS

CITF-funded studies continue to examine how COVID-19 affects people at higher risk of serious outcomes due to health conditions. Over the past two months, several more CITF-funded papers on the subject have been published, showing encouraging results for those with inflammatory bowel disease and HIV, but less encouraging results for those with chronic kidney disease.

Third doses lead to high antibody responses among people living with inflammatory bowel disease (IBD)

Close to 100% (99.6%) of individuals living with inflammatory bowel disease (IBD) mounted an antibody response after their third vaccine dose, according to a letter published in *Gut,* under the leadership of Dr. Gil Kaplan (University of Calgary) and co-authored by Dr. Sasha Bernatsky (Research Institute of the McGill University Health Centre). Age, sex, IBD type, vaccine product, and vaccine schedule were not found to influence the generation of antibodies. However, individuals taking corticosteroids had lower spike antibody concentrations compared to those who did not.

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People living with HIV show normal antibody longevity after full COVID-19 vaccination and have strong third dose responses

In a paper published in the *Journal of Infectious Diseases*, Drs. Zabrina Brumme and Mark Brockman (Simon Fraser University/BC Centre for Excellence in HIV/AIDS), and members of the Canadian HIV Trials Network, led by Dr. Aslam Anis (University of British Columbia), demonstrated that responses to COVID-19 vaccines in people living with HIV (PLWH) are similar to those without HIV. Following both the second and third vaccine dose, PLWH also exhibited similar total antibody and neutralizing antibody responses against the Omicron variant as those without HIV. Antibody responses against the Omicron variant were not as strong as those against the original SARS-CoV-2 strain in both healthy individuals and PLWH.

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The impact of COVID-19 vaccines for patients with chronic kidney disease

An editorial in the *Clinical Journal of the American Society of Nephrology* found that vaccine efficacy against SARS-CoV-2 was substantially less for individuals with chronic kidney disease (CKD) than for healthy participants. The study, led by Drs. Matthew Oliver (University of Toronto) and Peter Blake (Western University), did find that vaccines provided people with CKD high protection against severe outcomes.

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Moderna, fourth doses, and hybrid immunity help residents of long-term care

A preprint, not yet peer-reviewed, led by Drs. Dawn Bowdish and Andrew Costa (McMaster University), showed that among residents of long-term care facilities, there was a lower risk of an Omicron infection when the person had:

- Received three doses of Moderna or a combination including Moderna (as compared to three doses of Pfizer);
- Any fourth mRNA vaccine dose; and
- Hybrid immunity induced by a SARS-CoV-2 infection in the three months prior to the beginning of the Omicron wave.

Moreover, neither age nor gender was a determining factor in the risk of Omicron infection.

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Unvaccinated paramedics at greater risk of COVID-19 infection

A CITF-funded study published in the *Annals of Emergency Medicine,* led by Drs. Brian Grunau and David Goldfarb (University of British Columbia), did not find that paramedics were at higher risk of catching SARS-CoV-2 than a control group of blood donors in the pre-Omicron era. There is evidence, however, that more unvaccinated paramedics got COVID-19, compared to unvaccinated blood donors.

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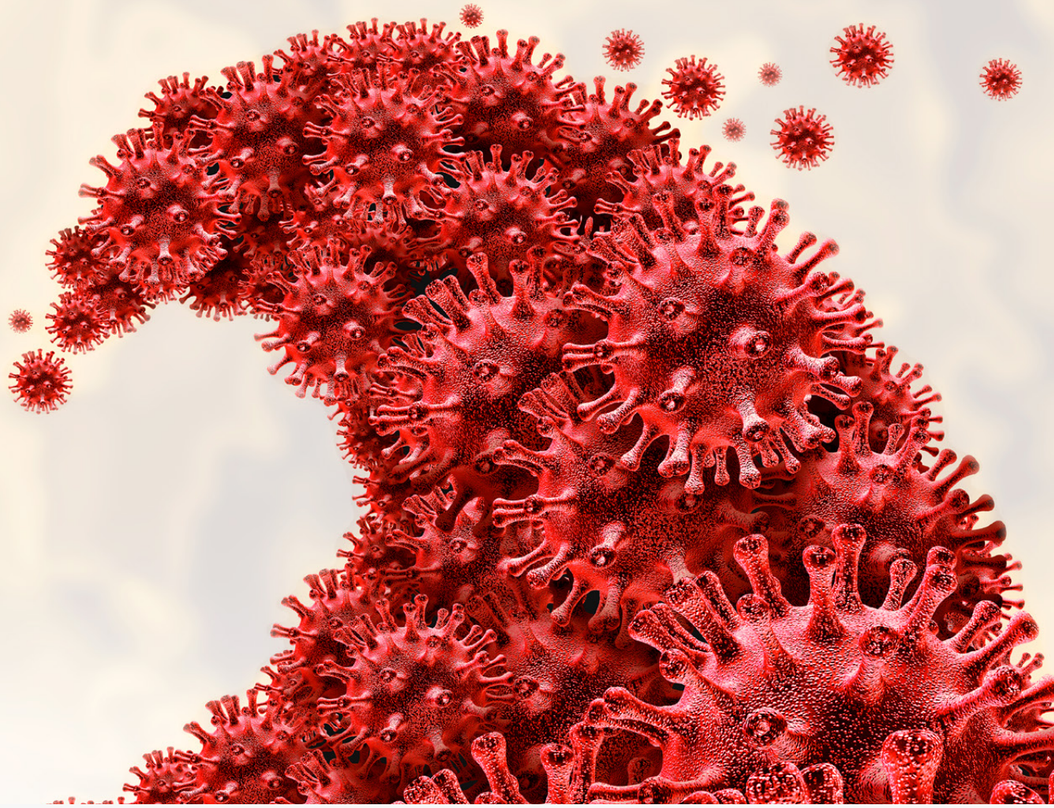
The Omicron tsunami

Omicron is the most highly transmissible variant of the SARS-CoV-2 virus that we have faced thus far in the pandemic. It caused an unprecedented rise in infection-acquired seroprevalence across Canada. Between August 2021 and May 15, 2022, the percentage of Canadians with infection-acquired antibodies rose from 2% in the pre-Delta wave to over 40% after five months of the Omicron wave. This percentage rose to 56% by early June. This corresponds to some **17.5 million Canadians** infected with Omicron.

Though vaccines continue to be highly effective at protecting against serious illness and death, Omicron has proven more capable than previous variants of infecting those who were already vaccinated – what is known as a breakthrough infection. For the eighth seminar in our *Research Results and Implications* series, the CITF assembled a panel of experts to address where we stand and where we are headed in the Omicron era.



KEY POINTS:

1. The idea that Omicron infection will be mild and, therefore, may be taken lightly is a **dangerous myth**: as many Canadians had died by June 2022 due to Omicron as during the two preceding waves of the pandemic.

2. Hybrid immunity (due to both vaccination and infection) does offer some protective advantages in the short term, however **infection is not a viable strategy** to achieve or maintain immunity.

3. Omicron appears **different to the immune system** compared to the original (wild-type) virus, thus explaining how it evades immune defenses. There is no guarantee that an Omicron infection will confer protection.

4. 17- to 24-year-olds and those residing in more disadvantaged neighbourhoods have been **disproportionately affected** by Omicron.

5. Regardless of whether an individual has been infected, everyone is encouraged to **keep up to date on vaccination**. As immunity wanes over time and SARS-CoV-2 has evolved into a more infectious virus, people need to periodically boost their immunity.

6. Despite no longer being mandated by provinces and territories, Canadians should **continue public health measures** using common sense to protect themselves from COVID-19 transmission and infection.

7. **Vaccine confidence needs to be reinforced** as it is by now clear that vaccination is the only viable means to protect people from severe disease and death.

8. Notwithstanding widespread pandemic fatigue, there are **new waves on the horizon**. The virus continues to circulate around the world at an alarming rate and mutate in unpredictable ways, thus demanding continued vigilance and precautions.

» FULL SUMMARY

What we know about COVID-19 & pregnancy

The team at the CITF Secretariat has scoured numerous journals from around the world looking for answers about COVID-19, vaccines, and pregnancy. Here is what we've found.

People with COVID-19 who are **pregnant are more at risk** than non-pregnant individuals with COVID-19. They are:

2.65 times more likely to require hospitalization

&

5.46 times more likely to be admitted to the ICU

Furthermore, COVID-19 infection has been associated with **adverse pregnancy outcomes**:

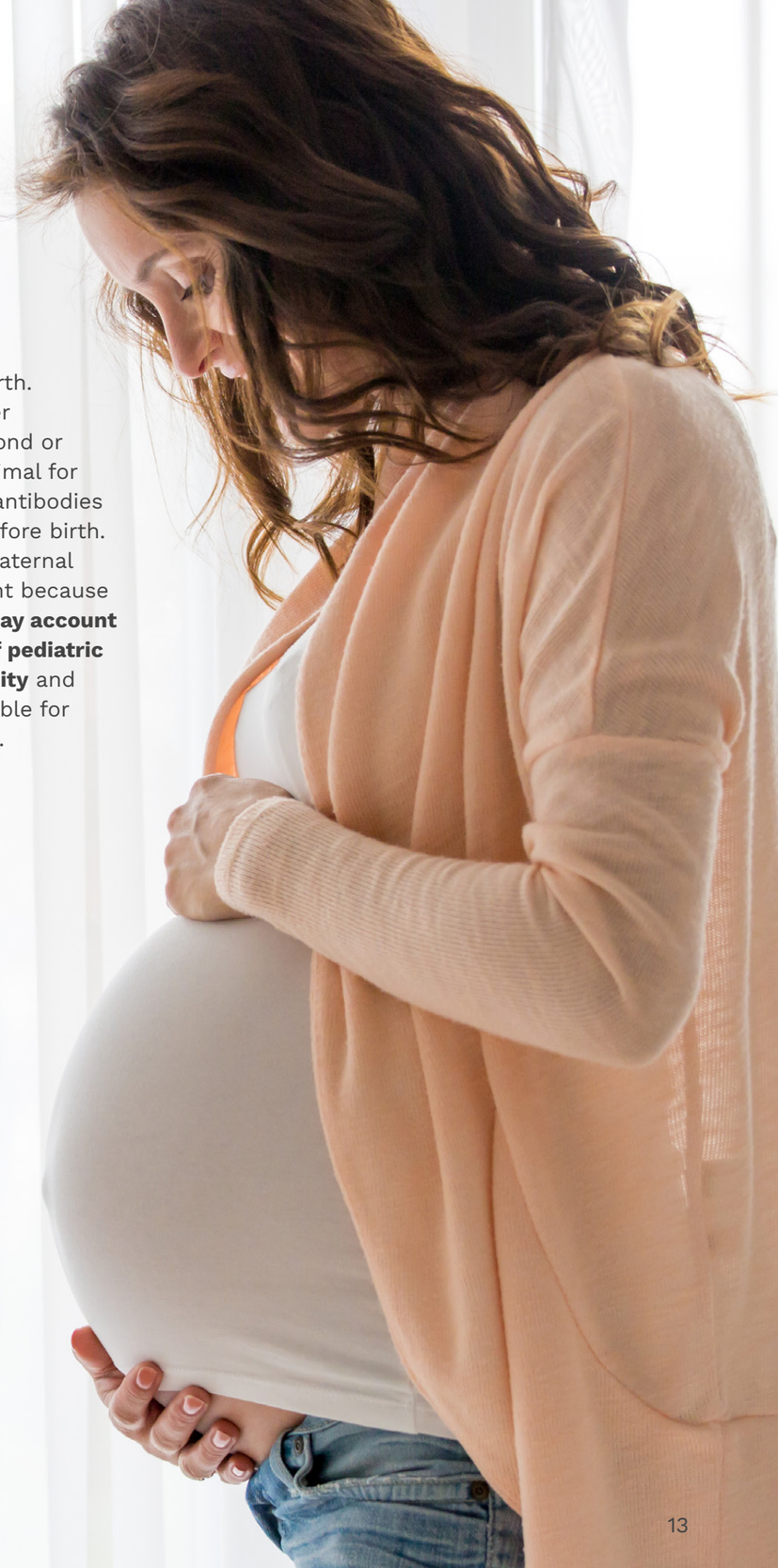
- The rate of preterm birth was 11.1% among those who had COVID-19 while pregnant, compared to only 6.8% of those who did not have the disease while pregnant;
- People with a laboratory-confirmed SARS-CoV-2 infection at the time they gave birth were more than twice as likely as uninfected people to have their baby die at birth or be born prematurely.

On the other hand, extensive research, including by CITF-affiliated researchers, has shown that:

- **COVID-19 vaccines are safe** for pregnant people and their babies;
- **Maternal vaccination offers benefits to the fetus**, given that maternal antibodies were detected in the fetus within 16 days of vaccination;
- Infants born with maternal antibodies against COVID-19 could be **protected in the first several months** of their lives, when they are most vulnerable;
- At 6 months, 57% of infants born to mothers vaccinated with an mRNA vaccine had **detectable antibodies** compared with 8% of infants born to mothers infected with COVID-19 during pregnancy.

Antibodies can be transferred from mother to baby via the placenta and umbilical cord in utero, and through breast milk following birth. Research indicates that a mother being vaccinated in the late second or early third trimester may be optimal for high levels of anti-SARS-CoV-2 antibodies to be transferred to the baby before birth. Understanding the transfer of maternal antibodies to infants is important because **maternal COVID-19 infections may account for a disproportionate burden of pediatric SARS-CoV-2–associated morbidity** and vaccines are not currently available for infants younger than six months.

» **READ MORE**



What can we expect from the COVID-19 pandemic this fall in Canada?

With the arrival of a seventh wave of the pandemic this summer, we approached CITF-affiliated experts for answers to some of the most pressing questions about COVID-19. Generally, we wanted to provide you with an idea of where we stand and where we are headed. Here are excerpts from their answers.

» READ ALL THE ANSWERS

What should we expect this fall?

"One of three things will happen: a disease can get better, it can stay the same, or it can get worse. The likelihood of things getting better tends to be proportional to the medical interventions applied. If no interventions are applied, you're left hoping for spontaneous improvement. COVID-19 has shown that that won't be its trajectory in the foreseeable future."

– **Dr. Donald Vinh**, McGill University

When should I get vaccinated?

"Follow public health recommendations and make sure you stay up to date with vaccination. At the moment, that means you should have had four doses of a COVID-19 vaccine if you are over 60 years of age, three doses if you are between 18 and 59, two doses if you are under 18, and five doses if you are severely immunocompromised."

– **Dr. Allison McGeer**, University of Toronto

Should we be confident in the safety of new vaccines?

"The regulatory process for vaccine approval and the process for recommending whether and how new vaccines should be used in Canada are amongst the most rigorous in the world. Health Canada reviews all available data on the safety and efficacy of vaccines and ensures that sufficient data have been collected in an appropriate manner before determining whether or not a vaccine should be authorized for use."

– **Dr. Scott Halperin**, Dalhousie University

What can we expect from the next-generation vaccines?

"Omicron-adapted vaccines are being developed and tested by Pfizer and Moderna and may be ready this fall. Preliminary results showed high levels of neutralizing antibodies against BA.1, but the vaccines were less effective against the more recent BA.4 and BA.5 strains. The FDA recommended manufacturers add BA.4 and BA.5 spike protein components. It is not clear when that will be ready. Nasal spray and oral vaccines are being developed and tested by more than a dozen companies."

– **Dr. Jun Liu**, University of Toronto

What behaviours should I adopt to keep myself and my loved ones safe?

"To keep yourself and your loved ones safe, it is key to think smartly and use good old common sense. The more transmission there is, the higher the likelihood of mutations. Anything you do to interrupt and prevent transmission can contribute to ending the pandemic sooner."

– **Dr. Catherine Hankins**, Co-Chair of the COVID-19 Immunity Task Force

If my immune system is compromised or I am older, should I take added precautions?

"The Omicron variants circulating now are good at infecting people with weaker responses to vaccination, those over the age of 60, or whose immune systems are compromised. Although it may feel like getting COVID-19 is inevitable, emerging data show that each time we get infected there is a potential risk to our long-term health. Plus, having been infected once doesn't always stop future infections."

– **Dr. Dawn Bowdish**, McMaster University

Any advice regarding protecting my children from COVID-19 as they head back to school?

"We expect another COVID-19 wave as the school year starts and people spend more time indoors. We know that socializing outdoors (or optimizing indoor ventilation), wearing a well-fitting mask when indoors, and frequent hand washing reduce transmission of COVID-19 and other respiratory viruses. Also, while vaccines may not be as effective at preventing mild infections in the Omicron era, studies show vaccination still reduces hospitalization risk by 40-90% in children and adolescents."

– **Dr. Jesse Papenburg**, McGill University

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in collaboration with

Coronavirus Variants Rapid Response Network | Réseau de réponse rapide aux variants du coronavirus

Seminar Series | Research Results & Implications

The Eighth Wave

Challenges and predictions for an uncertain future

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Monday, September 19, 2022
1 p.m. to 2:30 p.m. EDT

Our 9th *Research Results and Implications* seminar will assemble experts from the CITF and CoVaRR-Net (Coronavirus Variants Rapid Response Network) for a panel discussion on: How many Canadians have been infected? What are the projections for the number of infections this fall? What does it mean to be "up-to-date" with vaccinations? Why is it so difficult to define *immunity*? What are the prospects for next generation vaccines? Does it remain important to protect myself against infection? What measures should I take to protect myself against infection? Three years and seven waves into the pandemic, where do we stand and what can we expect? How should we approach COVID-19 in the context of other health challenges?

Panelists **Host**

Shelly Bolotin MSc, PhD, MScPH

David Buckeridge MD, PhD, FRCPC

Charu Kaushic PhD

Mel Krajden MD, FRCPC

Sarah (Sally) Otto PhD

Timothy Evans MD, PhD

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