COVID-19 IMMUNITY TASK FORCE

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

SEPTEMBER
2022

CITF MONTHLY REVIEW

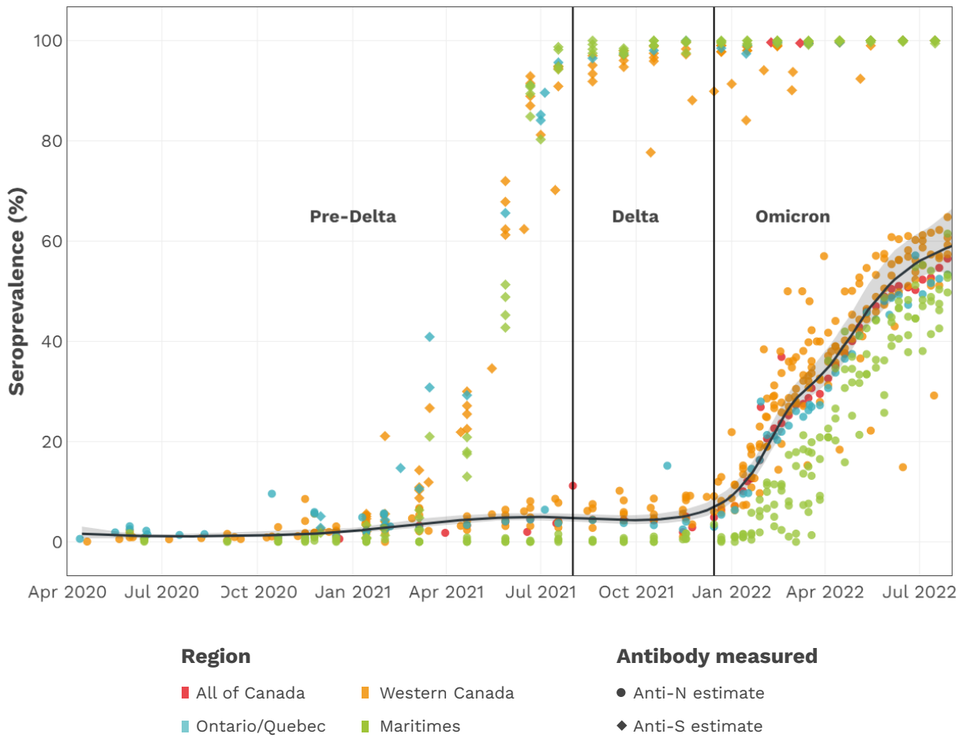
A research synthesis on COVID-19 in **older Canadians**

Seroprevalence in Canada **nears 60%**

A summary of our **Eighth Wave seminar**

SEROPREVALENCE IN CANADA | JULY RESULTS

Percentage of Canadians with previous infection nears 60%

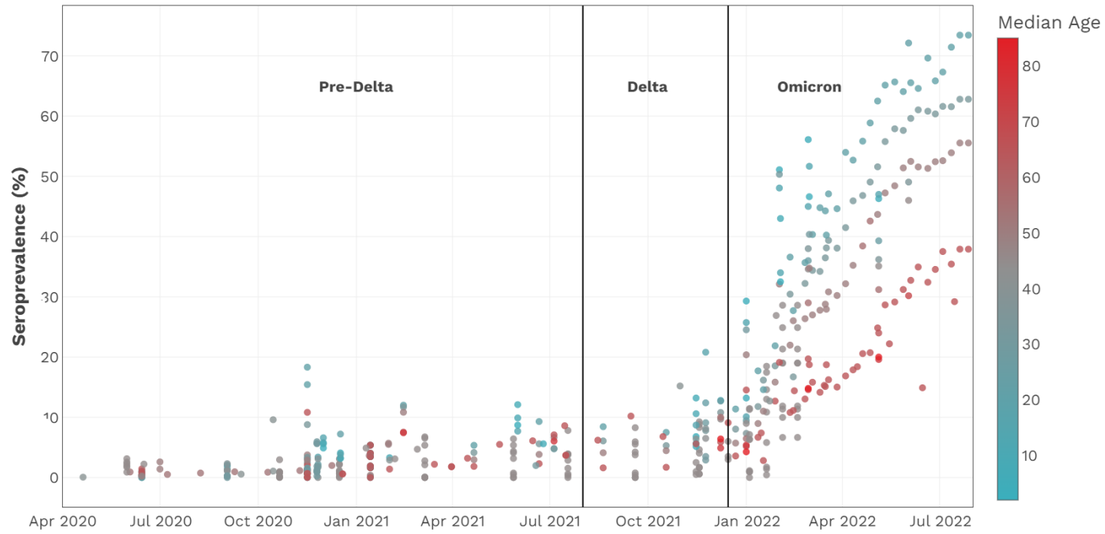


Overall, infection-acquired seroprevalence in Canada increased significantly between November 30, 2021, and July 31, 2022: from 5.8% pre-Omicron to 59.1% by the end of July – after about eight months with circulating Omicron variants. This is based on serosurveys from over 20 CITF-funded or partner studies.

We estimate this rise in seroprevalence during the Omicron phase of the pandemic corresponds to at least **18.2 million Canadians** being infected between December 15, 2021, and July 15, 2022. This would suggest that the infection rate over this period was more than 10 times the rate in the biggest pre-Omicron waves and that, on average, there were more than **86,000 infections per day**.

The actual number of newly infected (or reinfected) Canadians may have been higher because some people infected early in the Omicron phase of the pandemic may no longer have detectable anti-N antibodies.

Seropositivity up in all provinces and especially among younger Canadians



Seroprevalence due to infection continued to increase during the Omicron wave across all Canadian provinces between December 15, 2021, and July 31, 2022.

The younger age groups had the highest levels of infection-acquired seroprevalence. In the graph above, the brightest turquoise are the youngest Canadians sampled. According to Canadian Blood Services, young adults (17–24 years) had about 73% seropositivity in the last week of July. Estimates of seropositivity due to infection decreased with increasing age: 25–39 years (68%), 40–59 years (56%), and 60+ years (40%).

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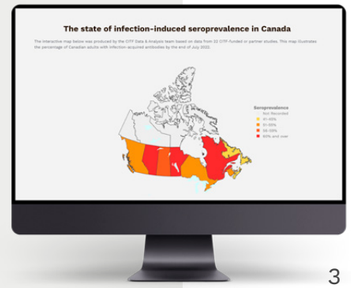
We have launched a new **Seroprevalence in Canada** webpage, with data visualized with interactive graphs which will be updated regularly.

An even newer feature: we have added a download button for those looking for the population-level data shown in the graphs in Excel format.



As far as we have come in learning about COVID-19 in the three years since it emerged as a global health crisis, there is still much for us to discover. Among the more intriguing challenges are the mechanisms behind long COVID and improving the formulation of vaccines to target new SARS-CoV-2 variants. CITF-funded researchers have recently made headway in both.

New insights into immune response underlying long COVID

Research on long COVID led by Dr. Manali Mukherjee (McMaster University), published in the *European Respiratory Journal*, has found two things: that in most people with persistent COVID symptoms, long COVID does not last forever, and there is a possible link between long COVID and autoimmune disease.

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New vaccines, including a trivalent vaccine, trigger strong immune responses against all SARS-CoV-2 variants in animal models

In a preprint, not yet peer-reviewed, researchers led by Dr. Ryan Troyer (Western University) generated four spike-based vaccines against the SARS-CoV-2 virus and measured antibody and cellular responses. All four – one based on the wild type (original strain), one based on Beta, one based on Delta and a trivalent vaccine combining all three – produced a strong neutralizing antibody response against all SARS-CoV-2 variants in an animal model, including against the Omicron variant.

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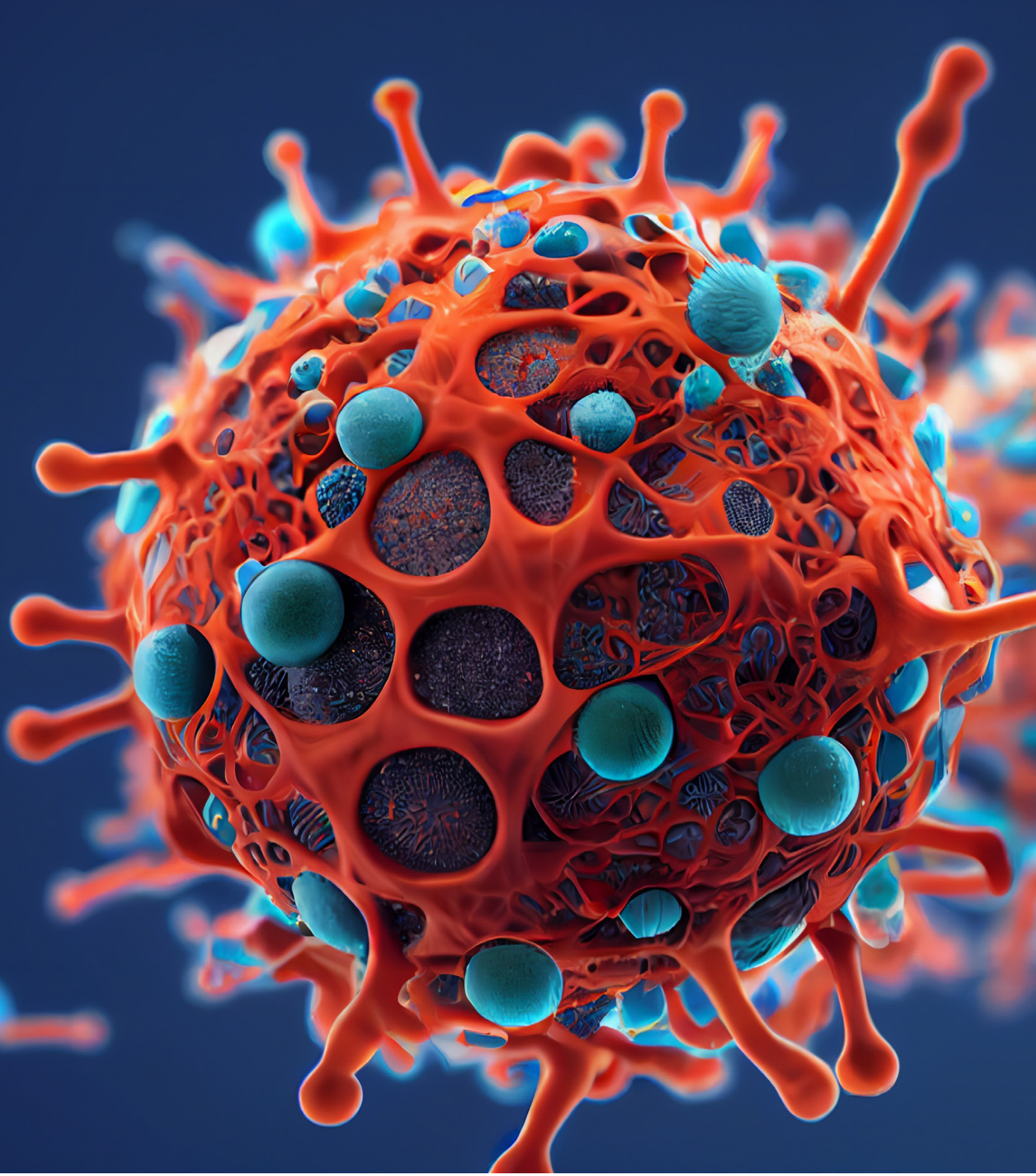

Those who are pregnant, or planning to become pregnant, have been particularly cautious about COVID-19 vaccines, despite mounting evidence of their vaccine safety and the dangers of becoming infected with SARS-CoV-2. The following CITF-funded studies further reinforce the advice that pregnant people be vaccinated for their own health, and that of their babies.

No association between COVID-19 vaccination status and health issues in pregnancy: Canadian National Vaccine Safety (CANVAS) Network study

Published in *The Lancet Infectious Diseases*, this article offers reassuring evidence that there is no significant association between vaccination status and health issues that prevent daily activity or necessitate a medical consultation in pregnant people. Led by Canadian National Vaccine Safety (CANVAS) Network researchers Drs. Julie Bettinger and Manish Sadarangani (University of British Columbia/British Columbia Children's Hospital Research Institute), the research also highlights that pregnant individuals actually suffered fewer significant adverse events after vaccination than did similarly aged non-pregnant females.

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COVID-19 vaccination during pregnancy is not associated with adverse birth outcomes

A study led by Dr. Deshayne Fell (University of Ottawa and the Children's Hospital of Eastern Ontario) and published in *BMJ* showed that vaccination against COVID-19 during pregnancy was not associated with any increased risk of overall preterm birth, spontaneous preterm birth, or very preterm birth. As well, vaccination was not associated with small-for-gestational-age at birth or stillbirth.

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The Eighth Wave: Challenges and predictions for an uncertain future

Since emerging in 2019, COVID-19 has defied predictions. Nonetheless, through the extensive and diverse resources directed against the pandemic over the course of nearly three years, we have gained tremendous insight and knowledge into the nature of SARS-CoV-2. Highly effective vaccines were created and deployed with unprecedented speed. Within the first year, they were credited with preventing 20 million deaths worldwide, including more than 310,000 in Canada.

As Canadians emerge from this past summer's seventh wave, the CITF assembled a panel of experts for the ninth in our *Research Results and Implications* seminar series to reflect on where we stand and what lies in wait as we continue to navigate a highly mutable situation and manage the risks presented by a virus that appears to be with us to stay.

KEY POINTS:

1. Infection-acquired antibodies were detectable in 60% of the population (approximately **18.2 million Canadians**) by the end of July 2022, as compared to 5.8% in the last week of November 2021.
2. BA.5 is currently the prevalent variant in circulation – there are **no new VOCs on the horizon**, but this is not to suggest the virus is done mutating.
3. COVID-19 cases will be driven by the drop in immune protection over time, thus **necessitating regular vaccine boosters**.
4. Immunity to COVID-19 – from vaccination, previous infection, or a hybrid of the two – wanes within approximately **six months**.
5. **Immunity is not static**, but waxes and wanes over time and according to individual and communal factors.
6. Everyone should have the **recommended number of doses** according to their age group, health status, and risk of exposure to infection.
7. **Broad vaccine uptake** will determine the impact of future COVID-19 waves.
8. Ongoing research into bivalent, intranasal, and pan-coronavirus **vaccines hold great promise** for enhancing protection against existing and potential VOCs, as well as yet-to-emerge threats.
9. COVID-19 has established itself in the human population and is, thus, **here to stay** for the foreseeable future. It will be important to **sustain a balance** between normal activities on the one hand, and preventing serious illness and protecting a fragile healthcare system on the other.
10. The Canadian **fall will likely be quiet** from a COVID-19 perspective, but the early winter may bring a different story.

» FULL SUMMARY & VIDEO

Treating pediatric patients who suffer from severe cases of COVID-19

While children have largely been spared from severe COVID-19 disease compared to adults and seniors, some have still suffered serious outcomes requiring medical intervention and hospitalization. Some also experience lingering complications such as Multisystem Inflammatory Syndrome in Children (MIS-C), a rare but serious condition that can affect the heart, blood vessels, and other organs. CITF-funded experts Dr. Jesse Papenburg (McGill University) and Dr. Rae Yeung (University of Toronto) have recently contributed to articles addressing gaps in our understanding of COVID-19 in children (including infants less than a year of age), those impacted by MIS-C, and those with other comorbid conditions.

These studies have further elaborated the risk factors associated with severe outcomes of COVID-19 in young children and infants. While not exhaustive, these cohorts indicated that children readily recover from SARS-CoV-2 infections in the absence of comorbidities. Additionally, provided they receive adequate medical treatment and care, those with MIS-C could expect a full recovery.

While the data in these studies were collected prior to the Delta and Omicron waves, it was suggested that a lower incidence of MIS-C during this later phase of the pandemic may be associated with factors such as vaccination, increased physician recognition of MIS-C, and refinement of treatment strategies. This reflects a better understanding of the nuanced impacts of COVID-19 in various sub-groups of our population and more efficient and effective deployment of healthcare resources in treating patients.

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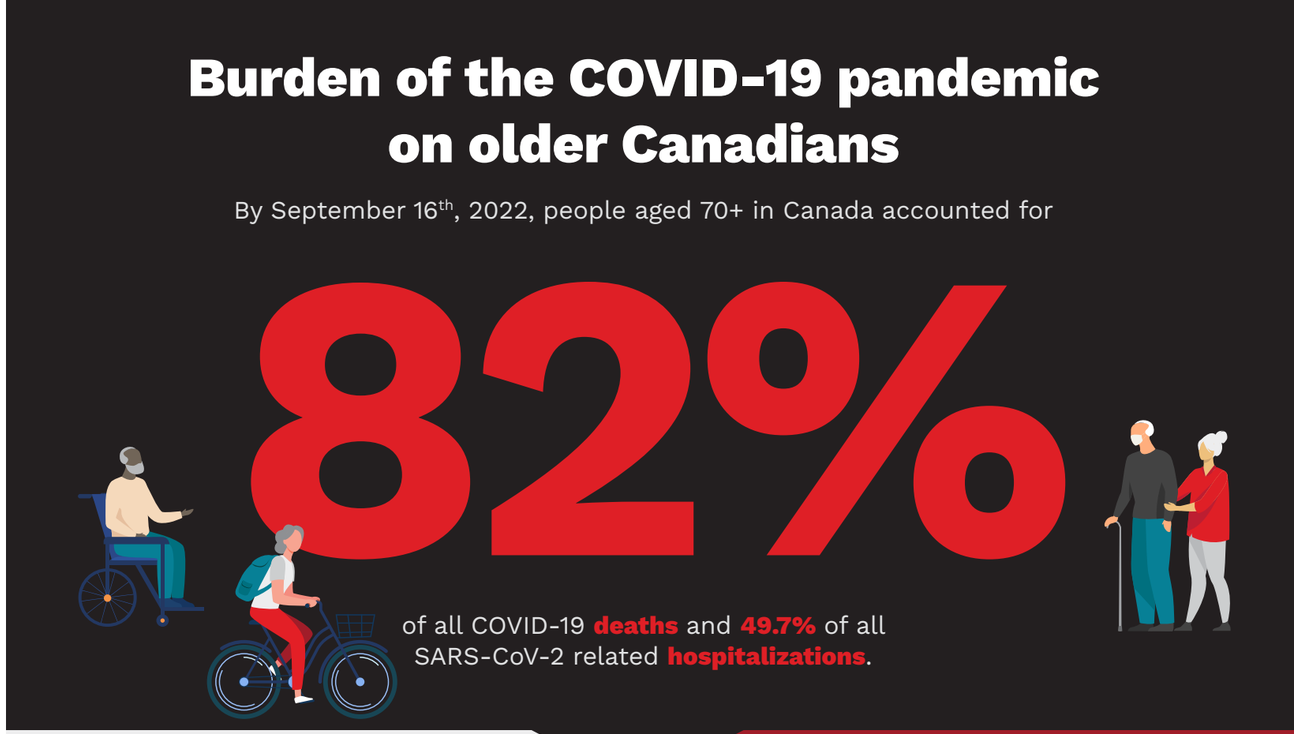
What the research tells us about COVID-19 in long-term care residents and older Canadians

Older Canadians have shouldered a disproportionately heavy burden of severe illness and death during the COVID-19 pandemic. As you can see on the infographic to the right, as of September 16, 2022, people over age 70 have accounted for 82% of all deaths, 35% of all intensive care admissions, and 50% of all hospital admissions due to SARS-CoV-2 infection in Canada.

Given these facts, we have synthesized CITF-funded and international research results to answer the following questions:

1. How hard were residents of Canada's long-term care (LTC) homes hit during the initial waves of the COVID-19 pandemic? Why did Canada's LTC residents have such high rates of severe illness and death during the first waves of the pandemic?
2. What makes older Canadians and LTC residents more vulnerable to SARS-CoV-2 infections, severe disease, and death?
3. How effective have vaccines and boosters been in protecting LTC residents and older Canadians?
4. How has the Omicron wave affected the immunity of older Canadians?
5. How much will the newly approved bivalent vaccine help older Canadians?
6. How effective have non-pharmaceutical interventions been in protecting older Canadians?
7. How often will a booster be required among older Canadians?
8. Should masks be worn by staff and visitors in LTCs and by older Canadians when they congregate in public?

» FIND THE ANSWERS



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Seminar Series | Research Results & Implications

COVID-19 and older Canadians: Where are we now?

Coming in October, stay tuned!

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The COVID-19 Immunity Task Force (CITF) supports research projects looking at various aspects of COVID-19 infection and immunity in older Canadians. Our 10th *Research Results and Implications* seminar will assemble several CITF-funded researchers to update us on their latest findings and answer questions such as:

- How important are boosters for those aged 70+?
- Should older Canadians be masking, distancing, and limiting their social interactions indoors?
- Is the risk of getting COVID-19 higher if you're living in a long-term care (LTC) home, or, if you're 70+ living in the community?
- Will infection prevention and control measures implemented in LTC homes due to COVID-19 have a long-term positive impact in warding off other infections in these settings?
- Is it safe to put your loved ones in LTC homes these days in Canada?

Presentations from several CITF-funded studies will be followed by a panel discussion. Presenters will then take questions from the audience.