



**COVID-19
IMMUNITY
TASK FORCE**

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

Summary report # 10

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

Background

One year ago, the COVID-19 Immunity Task Force (CITF) devoted its second *Research Results and Implications* seminar to [*Protecting Canada's long-term care residents from COVID-19: The evidence behind the policies*](#). Today, older Canadians continue to be identified as a high-risk population for more severe COVID-19 disease. While vaccination-induced immunity has greatly improved their situation, older Canadians, whether living in long-term care (LTC) facilities, seniors' residences, or within the community, remain more vulnerable than the general population to reinfections, hospitalizations, and death.

Consequently, for our 10th *Research Results and Implications* seminar, we assembled a panel of CITF-funded experts to address where we stand with respect to COVID-19 among older Canadians during the Omicron era.

Researchers and CITF-funded studies included

Focus	Lead researcher(s) and affiliation	Research population	Location of study
Synthesized data on seroprevalence among older Canadians	Dr. Tim Evans Executive Director, CITF	Older Canadians 70+	Canada
PREVENT-COVID study	Dr. Manish Sadarangani University of British Columbia; BC Children's Hospital	Adults 50+	British Columbia
STOP-CoV Study	Dr. Sharon Walmsley University Health Network; University of Toronto	Adults 30 – 50 Adults 70+	Southern Ontario
Antibody responses to COVID-19 vaccination in elder adults	Dr. Zabrina Brumme Simon Fraser University	Older adults – median age 78	Vancouver
COVID-19 vaccinations and infection in LTC	Dr. Andrew Costa McMaster University; St. Joseph's Centre for Integrated Care, Hamilton	Older adults	Ontario
COVID-19 LTC immunogenicity sub-study	Dr. Alison McGeer Sinai Health System; University of Toronto	Older adults – median age 88	Toronto & Simcoe Region, Ontario

At a glance: key findings from CITF-funded research

The findings in this summary are, in some instances, unpublished, and have not yet been peer-reviewed. Details about these findings are found below.

Key findings:

- The pandemic has taken a devastating toll on older Canadians: as of September 16, 2022, **people aged 70+ accounted for 82% of all COVID-19 related deaths and 50% of all SARS-CoV-2 related hospitalizations** in Canada.
- Among seniors, **rates of infection have been highest among residents of long-term care facilities** because congregate settings have been susceptible to the spread of the highly transmissible virus. Other factors included fragility, older age and underlying medical conditions.
- **Hybrid immunity (a combination of vaccination and infection)**, particularly when the infection followed a third dose of vaccine, produces the highest antibody boost, but infection does not come without risks.
- **Hybrid immunity is mixed and short lived.** Antibody levels were highest in people with a prior SARS-CoV-2 infection, but those extra antibodies waned starting at three months. In addition, immunity following Omicron BA.1/BA.2 infection is not protective against Omicron BA.5
- **Prior COVID-19 infection is the best predictor of neutralizing antibodies:** 93% of previously infected, and 60% of not previously infected individuals had neutralizing antibodies, even against BA.5.
- Each dose of vaccine succeeds in increasing anti-receptor binding domain (RBD) antibodies in everyone, but **antibodies decline more rapidly in older populations.**
- Because immunity wanes over time, **keeping up to date on vaccines means being vaccinated every four to six months.**
- **It is important to have adequate immunity before the next wave unfolds, for older Canadians no matter where they live.** Under the current circumstances, a boost is required roughly every six months (an infection can be treated equivalent to a vaccine dose in this respect).
- **It is recommended that older Canadians continue to exercise caution by masking, maintaining social distance, and avoiding crowded settings.**

More in depth

Older Canadians are more vulnerable to severe outcomes from SARS-CoV-2 infection

The first waves of the pandemic, in particular, took a heavy toll among Canadians over the age of 70, who have accounted for 82% of all COVID-19 deaths and 50% of all hospitalizations related to COVID-19 as of September 16, 2022.

Three factors have been largely responsible for making these people more vulnerable:

- **Frailty and old age weaken the immune system**, reducing a person's overall capacity to fight off infection.
- **Underlying medical conditions** tend to multiply with age, which constitutes a risk factor.
- **Living in congregate settings**, such as long-term care facilities, contributes to the spread of the highly transmissible and contagious SARS-CoV-2 virus. And, indeed, as the graph below illustrates, among older Canadians, rates of infection have been highest in LTC residents:

CITF-generated evidence from various funded studies highlight that:

- LTC residents were worst hit during the early waves of pandemic.
- During the Omicron era, there were fewer SARS-CoV-2 cases among older Canadians than among younger age groups. This may be due to aggressive vaccination strategies and stricter measures of safety among those 70+.
- Although residents of LTC have been most affected for much of the pandemic, community-dwelling seniors have begun to experience higher rates of infection in the past few months.



Hybrid immunity produces a strong antibody response, even in older Canadians, but not without risks

As the pandemic has evolved over time, **infection case histories have become far more complex and varied**: people have had different combinations of vaccines, given at different intervals, and may have been infected one or more times by the same or different variants, at different levels of severity. All these factors have an impact on an individual's production of antibodies and the state of their immunity. Consequently, Dr. Andrew Costa (McMaster University) spoke in terms of **“packages of protection,”** as opposed to one measure of immunity. Since the BA.5 variant of Omicron became the dominant strain of SARS-CoV-2, there is, he said, no discernable pattern showing the neutralizing capacity of hybrid immunity. He also pointed out that hybrid immunity is a mixed bag, and that it, too, is short-lived in LTC residents - hybrid immunity begins to wane three months post-infection. Also, residents are sometimes being infected multiple times.

Moreover, he added grimly, “In order to get any benefit from hybrid immunity, you have to survive the infection.” And that is by no means certain, especially among older adults. It has become popular to compare COVID-19 to the flu, but **COVID-19 is orders of magnitude more serious than the flu and can cause far more significant complications, such as long COVID.**

Our panelists agreed that it is far better to avoid infection altogether than to hope for hybrid immunity.

That being said and agreed upon, Dr. Manish Sadarangani (University of British Columbia) presented results from the PRospEctiVe EvaluatiON of immuniTy after COVID-19 vaccines (PREVENT-COVID) Study. His team compared different vaccine dosing regimens and intervals within a cohort of adults over the age of 50. Their findings included that a third dose of an mRNA vaccine provides a robust and durable antibody response regardless of the combination of vaccines used for the initial two doses.

Dr. Zabrina Brumme (Simon Fraser University) said that a first infection following a third dose of mRNA vaccine produced a significant boost to antibody levels. Additionally, six months later, antibody levels among those infected after three doses were still higher than among the uninfected after a third dose. And while her team found that those who were never infected have a more rapid decline in functional neutralizing antibodies against the BA.1 variant, she emphasized that this is not an argument in favour of infection.

Three doses are the minimum for protection

Good news for older adults (age 50+ years) in Dr. Sadarangani's findings: their antibody responses were similar to those of younger adults (under 50 years) following two doses of vaccine. However, both groups exhibited waning four months after the second dose, reinforcing the **importance of keeping up to date with one's vaccination.**

Because waning occurs faster among older adults, three doses are absolutely necessary in order to rise above the immunity threshold, pointed out Dr. Sharon Walmsley (University of Toronto), who presented data from the SafeTy and Efficacy of Preventative Covid Vaccines (STOP-CoV) study. Her team followed an older group of adults (median age of 73) than the PREVENT-COVID study, and found that immunity waned faster in this group (age 70+) when compared to the younger adults (age 30-50 years).

Dr. Brumme, looking at an older cohort (median age of 78), found that it took three doses of mRNA vaccines for older adults to achieve antibody equivalence with younger adults (median age of 41). By six months after the third dose, antibody levels had declined below what was induced after two doses, but the rate of decline was comparable in older and younger adults.

Older adults should all have a fourth dose of vaccine

Six months after the third dose, the ability to neutralize Omicron (BA.1) had declined to undetectable levels in 56% of younger adults and 96% of older adults, demonstrating, said Dr. Brumme, that **older adults in particular need a fourth doses within three to six months of the third dose to maintain antibody levels.**

Protection against BA.5 is less than against earlier variants

Regardless of age, neutralization of BA.5 is less than against BA.1, according to findings presented by Dr. Brumme and Dr. Allison McGeer (University of Toronto). Thus, the next generation of bivalent (combined wild-type and Omicron formulation) vaccines promises to be important in staving off the next wave of the pandemic.

Dr. McGeer stressed that **fifth doses need to be provided in LTC homes before the expected wave hits in order to afford the greatest protection.**

Personal behaviour remains important to prevent infection

Dr. Walmsley pointed out that people over 70 have had fewer infections than those between the ages of 30 and 50. This is likely due to the former taking greater precautions.

All presenters suggested that older Canadians continue to exercise caution in their personal behaviour. While everyone needs to strike a balance between living the life they want and protecting against COVID-19, masking indoors in group settings and maintaining social distance are sensible ways to lessen the risk of becoming infected.

Keeping up-to-date with vaccinations is another important defensive measure. Our experts advised against delaying in anticipation of some better vaccine on the horizon. Dr. McGeer pointed out that SARS-CoV-2 has mutated unpredictably and, therefore a future variant could be very different from the current Omicron. **It is important to have adequate immunity before the next wave unfolds.** Under the current circumstances, a boost is required roughly every six months (an infection can be treated equivalent to a vaccine dose in this respect).

Policy implications

Where do older Canadians stand

- **Older Canadians need to boost their immunity every 4 to 6 months to ensure effective immunity**, recognizing that protection against BA.5 is less than it was against BA.1 which, in turn, was less than against the wild-type SARS-CoV-2.
- Ideally older Canadians should get boosted with a **bivalent vaccine** to improve their protection against Omicron.
- **Structural issues regarding congregate living in LTC and seniors' residences have not yet been adequately addressed** despite the lessons of COVID-19. In terms of a new respiratory virus, Canada is not substantially better positioned than we were in 2019.
- **Notwithstanding the protection afforded by hybrid immunity, avoiding infection altogether is preferable to risking COVID-19.** More research is needed to understand the protection afforded against reinfection and the long-term effects of long COVID.
- With the elimination of mandated public health measures, **older Canadians are advised to take it upon themselves to adopt masking and social distancing**, in addition to keeping up-to-date with vaccination, to maximize protection.
- **It is important to be up to date on vaccination *before* another wave strikes**, thereby minimizing the impact on vulnerable older Canadians.
- As individual exposure to vaccines and infection varies and new variants demonstrate a stronger capacity to escape immunity, the state of seroprevalence becomes more complex and ***packages of protection will become a more accurate guiding principle than a simple accumulation of vaccine doses.***

References

Find more information on what the research tells us about COVID-19 in long term care residents and older Canadians here –

1. [What the research tells us about COVID-19 in long-term care residents and older Canadians - COVID-19 Immunity Task Force \(covid19immunitytaskforce.ca\)](#)
2. [CITF_Infographic-3-mockup6 \(covid19immunitytaskforce.ca\)](#)