COVID-19 IMMUNITY TASK FORCE

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

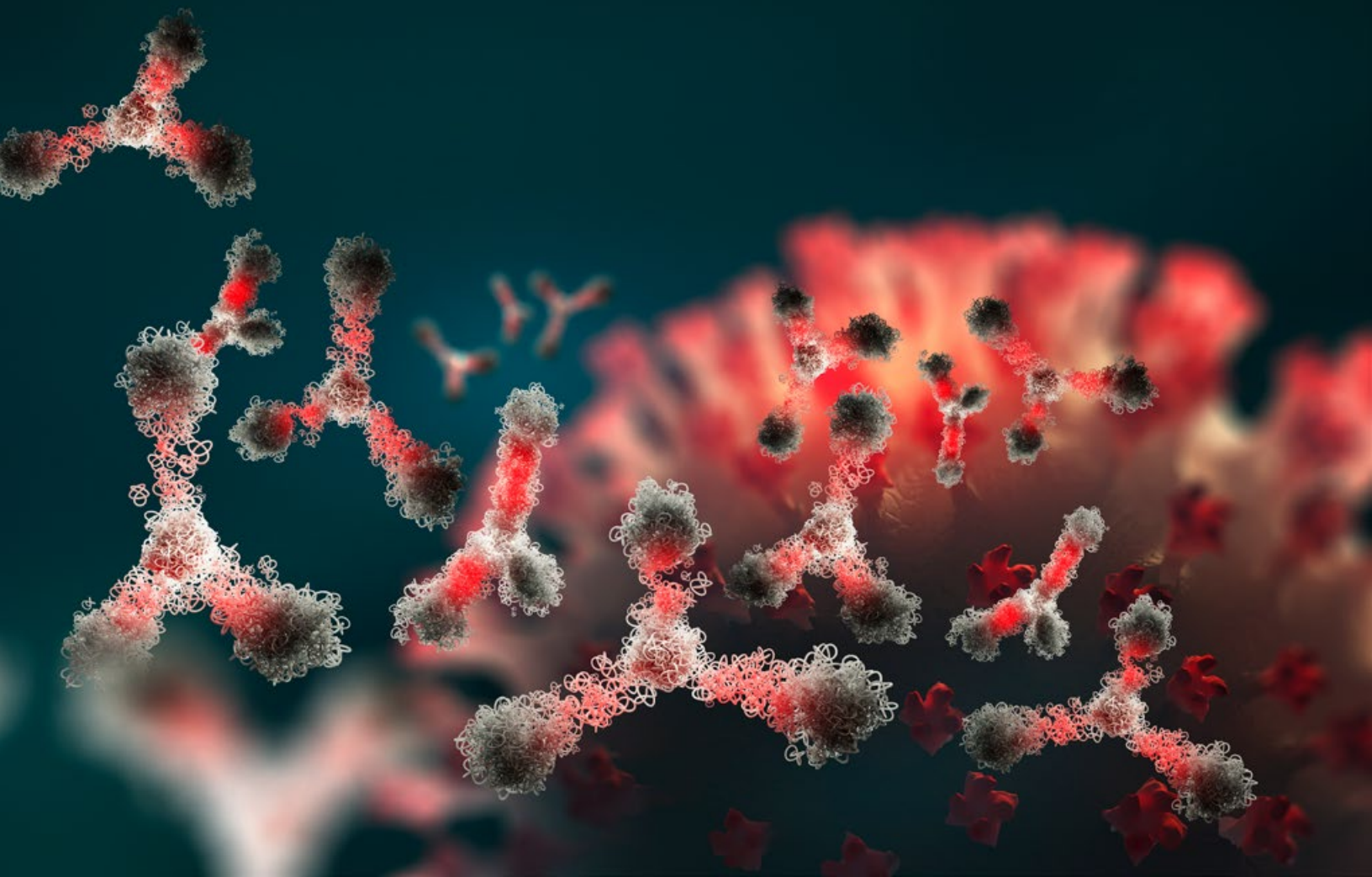
MAY
2022

CITF MONTHLY REVIEW

Infection-acquired immunity **not as strong** as vaccine-induced immunity

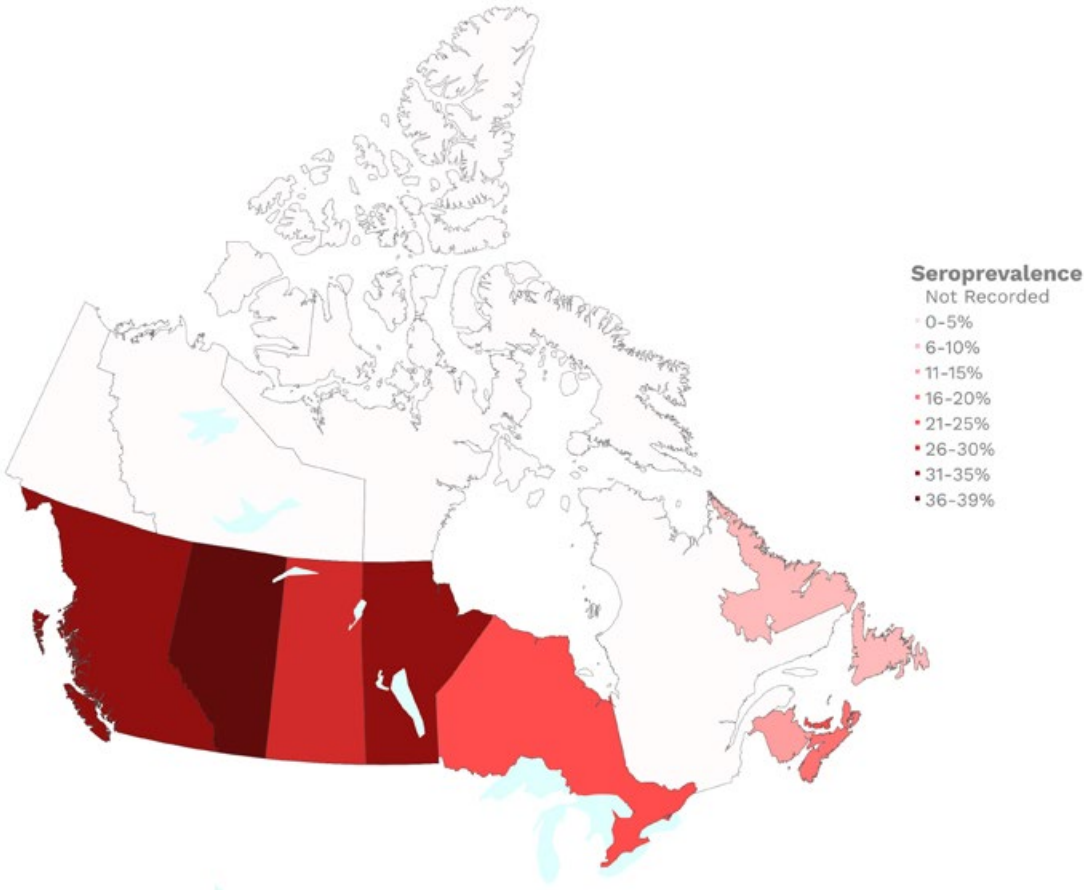
Explaining **vaccine hesitancy**

Growth in infection-acquired immunity **levels off in early March**



MID-MARCH REPORT

Growth in infection-acquired immunity slows in early March



The map above, interactive on our Results: blood donor organizations *web page, shows the state of infection-induced seroprevalence in Canada by mid-March 2022.*

The latest data from Canadian Blood Services show the rapid increase in infection-induced immunity began slowing by mid-March. The data show infection-acquired seropositivity increased moderately between the end of February and mid-March, up to 27.5% from 25.3%. The growth of infections continues to be concentrated in younger age groups with nearly half of all donors aged 17 to 24 (44.8%) showing evidence of a previous SARS-CoV-2 infection. The median concentration of spike antibodies acquired via immunization and/or infection, which increased substantially in January and February due to recent vaccinations and/or infections, decreased across all age groups by mid-March.

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Our website has new interactive features. Check it out!

The CITF modeling team has created more interactive graphs to amalgamate Canadian Blood Services data. Among them, the graph shown below allowing you to view the rates of infection-acquired seropositivity according to material deprivation, racial group, and age. This provides insight about the characteristics of who has been most adversely affected by COVID-19. Such data can assist officials and policy makers when they are deploying resources and can help address issues regarding access to public health, disseminating information, and ensuring equity for all Canadians.

» DISCOVER

The CITF funds many studies that examine how COVID-19 infection and vaccination affect specific populations in order to inform policy. Among those populations which could potentially be more at-risk are pregnant people, Canadians with certain medical conditions that can affect their immunity, and certain communities due to their socio-economic and/or geographic realities. Here we highlight three CITF-funded studies addressing these issues with interesting results this month.

Canadian study shows no significant association between COVID-19 vaccination and adverse peripartum outcomes

In a paper published in *JAMA*, Drs. Deshayne Fell and Kumanan Wilson of the University of Ottawa and Dr. Jeffrey Kwong from the University of Toronto, along with colleagues, found that COVID-19 vaccination was not significantly associated with an increased risk of adverse pregnancy outcomes. These included postpartum hemorrhage, chorioamnionitis, caesarean delivery, admission to neonatal intensive care, or a low newborn 5-minute Apgar score.

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People with HIV show normal antibody longevity after dual COVID-19 vaccination, and strong third dose responses

In a pre-print, not yet peer-reviewed, Drs. Zabrina Brumme and Mark Brockman from Simon Fraser University and the BC Centre for Excellence in HIV/AIDS, and members of the Canadian HIV Trials Network led by Dr. Aslam Anis from the University of British Columbia, demonstrated that responses to COVID-19 vaccines in people living with HIV (PLWH) were similar to those in controls without HIV. Following both the second and the third dose of COVID-19 vaccine, PLWH also exhibited similar antibody and neutralization responses against the Omicron variant compared to controls without HIV, though anti-Omicron responses were not as strong as those against the original SARS-CoV-2 strain.

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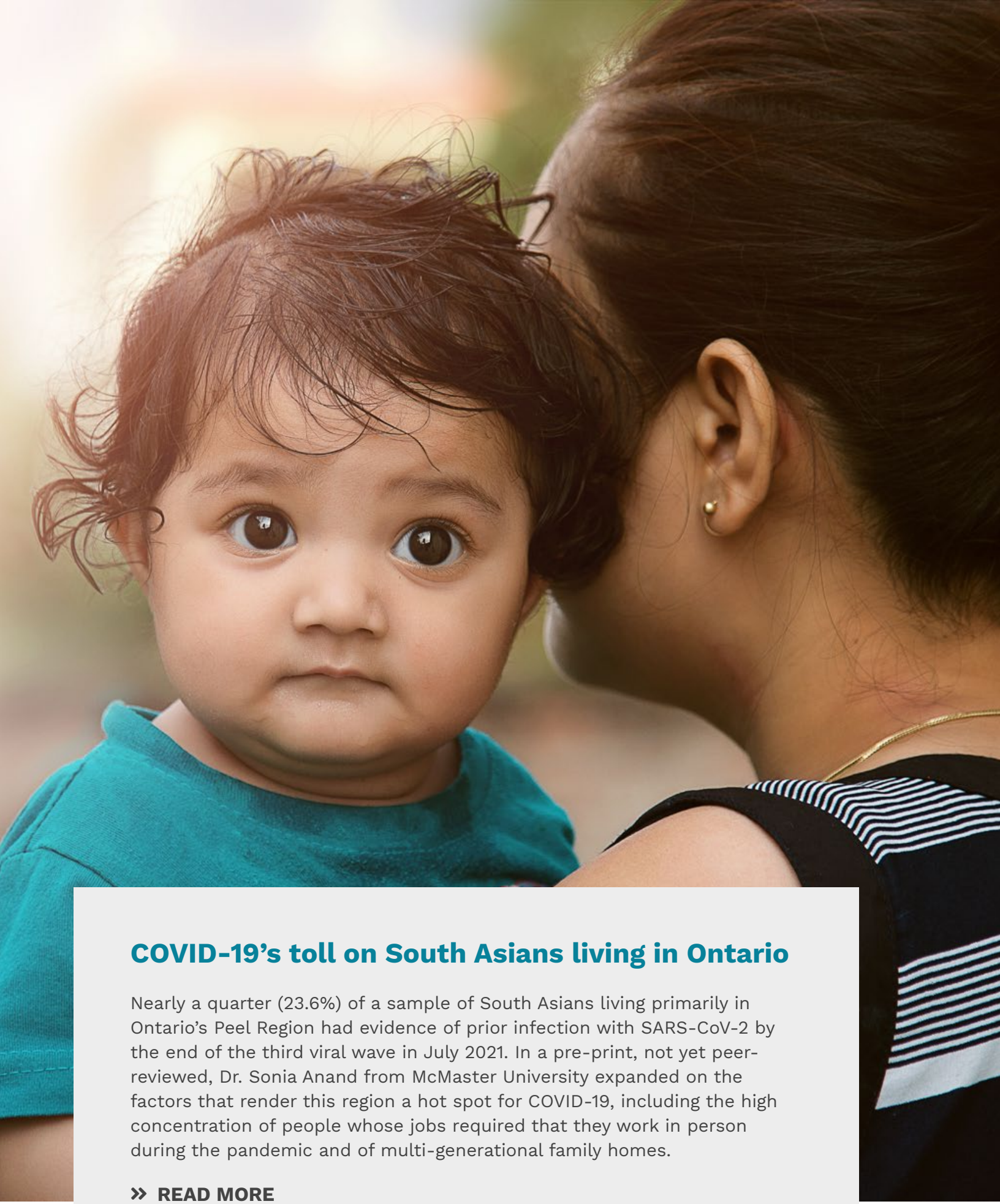

COVID-19's toll on South Asians living in Ontario

Nearly a quarter (23.6%) of a sample of South Asians living primarily in Ontario's Peel Region had evidence of prior infection with SARS-CoV-2 by the end of the third viral wave in July 2021. In a pre-print, not yet peer-reviewed, Dr. Sonia Anand from McMaster University expanded on the factors that render this region a hot spot for COVID-19, including the high concentration of people whose jobs required that they work in person during the pandemic and of multi-generational family homes.

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Despite ample evidence that COVID-19 vaccines are safe and effective, and with more than 80% of Canadian adults having been fully vaccinated, hesitancy continues to be an issue. Studies, including the following two highlighted here, try to elucidate those characteristics that predispose certain Canadians for or against being vaccinated.

Vaccine hesitancy among adults during Quebec's COVID-19 vaccination campaign

Published in *Frontiers in Public Health*, the CARTaGENE research team, based at the Research Centre of the Centre hospitalier universitaire Sainte-Justine and part of the CanPATH study, found that vaccine hesitancy among adults in Quebec was correlated with education levels, age and other socio-demographic determinants. The paper's authors, led by Drs. Rodolphe Jantzen, Mathieu Maltais, and Philippe Broët, had an opportunity to identify the factors associated with COVID-19 vaccination hesitancy during the spring 2021 vaccination campaign.

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Vaccine intentions and perceptions among public school staff within the Greater Vancouver Area

In a paper published in *Frontiers in Public Health*, Drs. Pascal Lavoie, Louise Mâsse and Allison Watts, along with colleagues from the University of British Columbia, explored the factors associated with the intention to get the COVID-19 vaccine, as well as the sense of urgency to get vaccinated, among school staff. Education about the risks and benefits of COVID-19 vaccines from a trusted source had the strongest relationship with vaccine intentions among this occupational group. Notably, those who expressed mistrust in information still intended to get vaccinated if they also perceived strong benefits from the vaccine.

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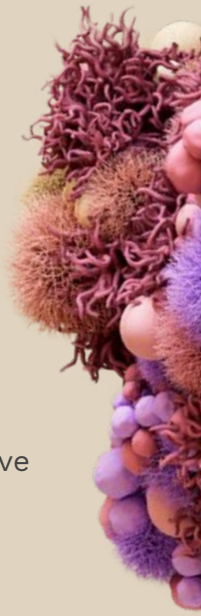
Infection-acquired immunity to SARS-CoV-2 is not as strong as vaccine-induced immunity

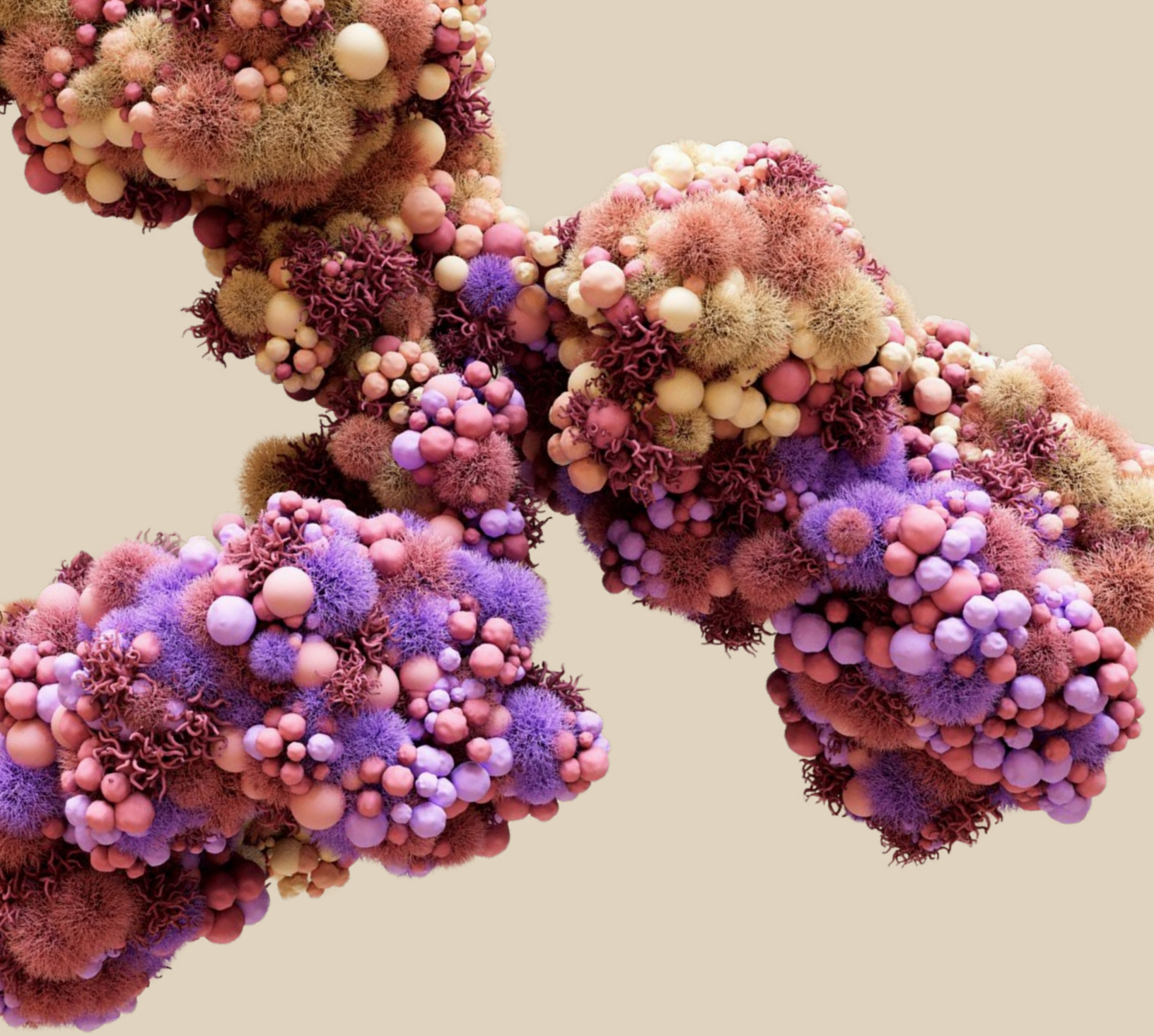
This review was written by members of the CITF Secretariat. The results and/or conclusions contained herein do not necessarily reflect the views of all CITF members.



As of April 26, 2022, more than 3.7 million SARS-CoV-2 infections and approximately 39,000 COVID-19-related deaths had been reported in Canada. The National Advisory Committee on Immunization (NACI) recommends COVID-19 vaccinations for all Canadians over the age of 5, including those who have been previously infected. More than 31 million Canadians have received two doses of vaccine and, of those, more than 17 million have received a third dose. Since the emergence of the extremely transmissible Omicron variant, including its BA.2 and XE subvariants which have caused a significant jump in infections, more and more people will have "hybrid immunity" – a combination of infection- and vaccine-induced immunity. The rise in infections may also leave some convinced that infection-acquired immunity may be enough to confer protection. It is therefore imperative to have a better understanding of the differences between infection-acquired and vaccine-acquired immunity.

IMMUNITY FROM INFECTION IS DIFFERENT THAN FROM VACCINATION

Data drawn from various studies strongly suggest that **infection-acquired immunity is not a sufficient substitute for vaccination**, supporting the need for everyone to be fully vaccinated (meaning third/fourth doses when eligible), including those who have recovered from previous infections. The consequences for those who become infected without being vaccinated appear to be far more severe than for individuals who are fully vaccinated: in Canada, the unvaccinated have a four to five times higher rate of hospitalization and death from COVID-19.



Because immunity wanes over time and new, more transmissible variants of concern have emerged over the course of the pandemic, reinforcing the immune system has proven necessary and, importantly, effective. A prime example: adults who received a booster or third dose of vaccine saw a 94% reduction in COVID-19-related severe outcomes and death during the Omicron era.

The evidence shows that those who have been vaccinated are, therefore, better protected against severe illness and will fare best against COVID-19.

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A long road to recovery for some: A closer look at long COVID

Long COVID is defined by a wide range of physical and mental health problems that linger for four to 12 weeks after a SARS-CoV-2 infection and, occasionally, longer. It can be triggered regardless of the severity of infection. While long COVID has been recognized as a disability by health entities worldwide, its prevalence, risk factors, and duration are still not well understood.

Recent work by CITF-affiliated experts Drs. Gaston De Serres, Danuta Skowronski, and Emilia Falcone and colleagues, released a pre-print, not yet peer-reviewed, looking specifically at long COVID among healthcare workers in Quebec. They showed that 46% of infected healthcare workers had symptoms persisting at four weeks, and for 40%, at 12 weeks after infection. Nearly all (96%) of those afflicted with long COVID were unvaccinated at the time of infection. Frequent symptoms included fatigue, loss of smell or taste, shortness of breath, cognitive dysfunction, headache, and joint and muscle pain. Those experiencing long COVID required about twice the amount of sick leave compared to their non-afflicted counterparts and 73% did not feel fully recovered when eventually returning to work.

Meantime, CITF-funded researcher Dr. Angela Cheung and her team published their protocol on long COVID in *BMJ Open*. They are aiming to characterize the presence, severity, and sporadic nature of disability with long COVID among adults in Canada and abroad. The protocol will serve to qualify the experience of those living with the condition.

The CITF has invested in five projects focused on long COVID in adults and children, including a new pan-Canadian study by Statistics Canada that aims to better understand COVID-19-related chronic symptoms and conditions.

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Wastewater surveillance proves a critical tool to monitor SARS-CoV-2 prevalence

As COVID-19 restrictions are lifted and clinical testing is generally limited to diagnostic purposes in healthcare facilities, the full extent of SARS-CoV-2 infection is largely unknown. This makes it extremely difficult to understand and predict the impact of COVID-19 on public health infrastructure going forward. An alternative strategy to monitor the trend of SARS-CoV-2 infections in the community is to utilize wastewater collected from municipal water treatment facilities.

Like some other pathogens, the SARS-CoV-2 virus is shed in the feces of infected individuals and an evaluation of total virus in wastewater can serve as an alternative to community-wide PCR testing. In recent papers published in *Epidemiology, Science of the Total Environment,* and *Applied and Environmental Microbiology*, CITF-funded researchers Drs. Lily Pang and Bonita Lee from the University of Alberta and Dr. Chris Sikora from Alberta Health Services, as well as researchers at the Public Health Agency of Canada (PHAC) demonstrate an optimal wastewater testing strategy and an alternative commercially available multiplex rapid test kit to understand the ongoing community spread of COVID-19 in real time in major metropolitan areas and remote locations alike.

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CanCOVID

Seminar Series | Research Results & Implications

COVID-19 vaccine safety

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Thursday, May 5, 2022
11:30 a.m. to 1:00 p.m. EDT

Vaccine safety remains a topic of concern for many. Join us for our 7th CITF/CanCOVID *Research Results & Implications* seminar where CITF experts will report on 1) results of ongoing vaccine safety monitoring in Canada, for both adults and children, 2) details about serious adverse events in Canada, including their frequency after various vaccine doses, 3) measures to mitigate the occurrence of serious adverse events, 4) the latest research on myocarditis and pericarditis, and 5) vaccine safety in pregnant people.

Presenters

Julie Bettinger
PhD, MPH

Scott Halperin
MD

Karina Top
MD, MSc, FRCPC

Jeff Kwong
MD, MSc, CCFP, FRCPC

Host

Tim Evans
MD, PhD

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