



COVID-19  
IMMUNITY  
TASK FORCE

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

MARCH  
**2023**

# CITF MONTHLY **REVIEW**

The CITF Scientific  
Meeting **closes a  
chapter**

**Pediatric infection  
& vaccination** since  
Omicron

**Scientific Meeting  
e-posters** now  
available



# COVID-19 Immunity Task Force commences final year after scientific meeting in Vancouver

CITF-funded researchers and advisors, along with federal, provincial, and territorial government health officials, gathered in Vancouver earlier this month to share research results and lessons learned from three years of the COVID-19 pandemic.

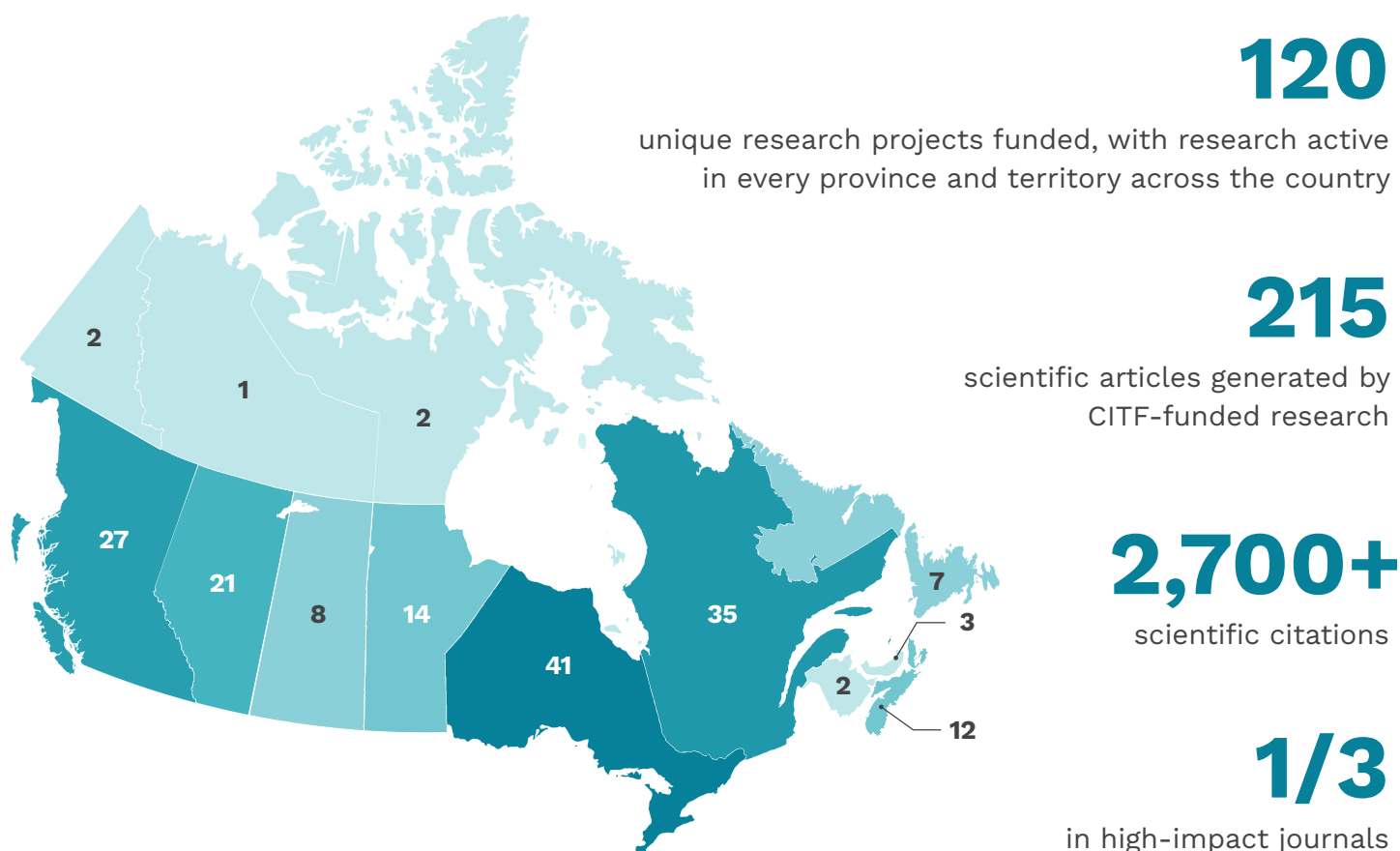
The CITF Scientific Meeting marked the end of the COVID-19 Immunity Task Force as we've known it, as the Task Force moves into its final year. Many funded studies have begun sharing final results and others are working toward completing their work in the coming months. The CITF Secretariat, which will continue operations until March 31, 2024, will, in partnership with the Public Health Agency of Canada (PHAC), continue consolidating and harmonizing results and data, ensuring they remain useful for pandemic preparedness going forward.

The final year will mark a wind-down of CITF communications. This is the last issue of the *CITF Monthly Review* ([find all issues here](#)) and we just held our last *Research Results & Implications* seminar on March 27, 2023. We will, however, continue to communicate all our funded research results and major news to you via our **Spotlight on CITF-funded Research** newsletter every two weeks, and we will continue adding updated and new content to our **website**.



## The CITF's impact so far

The Task Force was part of the federal government's efforts to mobilize evidence to address the SARS-CoV-2 pandemic. The CITF has worked with partners across Canada to generate insights on the nature of immunity arising from SARS-CoV-2 infection and vaccination. The goal has been to inform and advise decision-makers in their efforts to protect Canadians and minimize the impact of the COVID-19 pandemic. Some dimensions of this effort include (all numbers as of March 1, 2023):



The NEW ENGLAND  
JOURNAL of MEDICINE

THE LANCET

BMJ Journals

cmaj  
CANADIAN MEDICAL ASSOCIATION JOURNAL

The Journal of  
Immunology

PLOS ONE

viruses

AMERICAN  
SOCIETY FOR  
MICROBIOLOGY

Microbiology  
Spectrum

Open Forum  
Infectious  
Diseases

The Journal of  
Infectious Diseases

Clinical  
Infectious  
Diseases

## The CITF's impact so far (continued)

The **CITF's Seroprevalence in Canada modelling**, using data from over 20 supported or partner studies, continues to estimate the population level of infection-acquired and vaccine-induced seroprevalence over time. The seroprevalence data provide public health officials a big picture view on the evolution of the pandemic.

The **CITF Databank** was developed to further enhance the impact of CITF-supported studies. With a wide variety of standardized COVID-19 data, it offers researchers and partners in Canada and around the world easy access to population-level seroprevalence estimates and harmonized individual-level data from CITF-sponsored studies. The CITF Databank will continue to receive data as studies are completed and aims to remain an important reservoir of COVID-19 data in the years ahead (stay tuned!).

## Thank you to the volunteers who made the CITF a reality

The CITF was fortunate to draw on an amazing group of diverse experts from across the country who served in a volunteer capacity as members of the CITF Leadership Group, Executive Committee, Working Parties, and Networks.

"The commitment of this group cannot be overstated," says Tim Evans, Executive Director of the CITF. "As individuals, they consistently went beyond the call of duty and as a group they were terrific colleagues. We are all grateful to each and every one of them."

## Lessons learned

As the waves of the pandemic dissipate and we enter a new phase of endemic SARS-CoV-2, the CITF is actively reflecting on its experience in terms of lessons learned. This includes reviewing the key results emerging from its work, as well as pointing to both breakthroughs and barriers in its implementation. Moreover, as we prepare for what will inevitably be the next pandemic, the CITF will work with different agencies to secure and sustain important public health and research capacities that have been developed through the CITF.

## CITF Scientific Meeting poster presentations

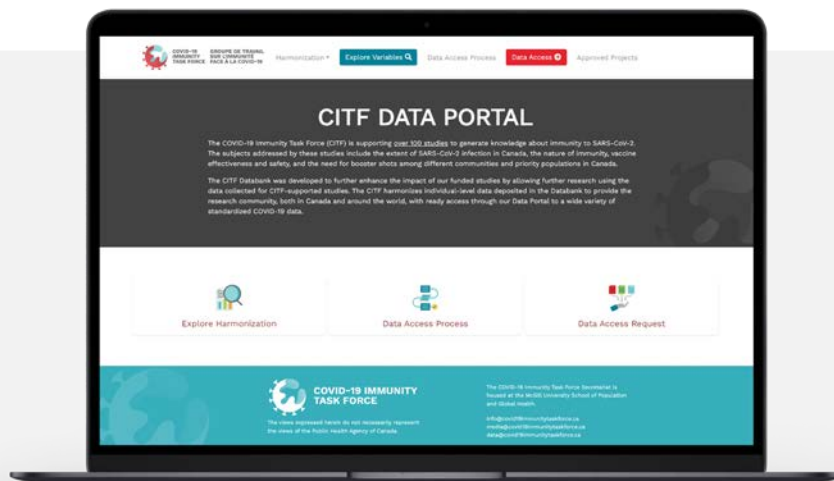
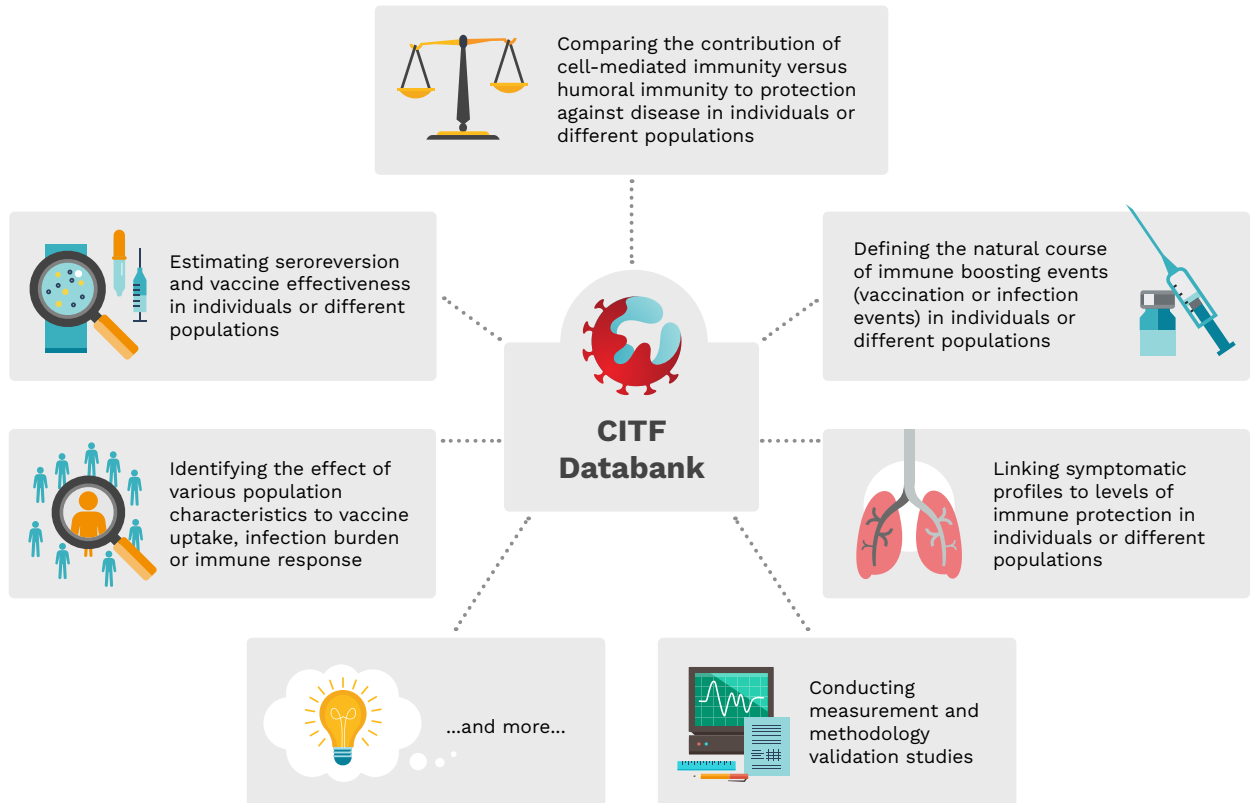
Nearly 70 investigators and trainees presented original research results at the CITF Scientific Meeting in early March in the form of e-posters with explanatory videos. We have uploaded many of the posters and accompanying videos to our website and will add even more over the coming weeks. The poster presentations offer a compelling snapshot of the knowledge that has been accumulated thanks to CITF funding.

» DISCOVER E-POSTERS



## CITF Databank

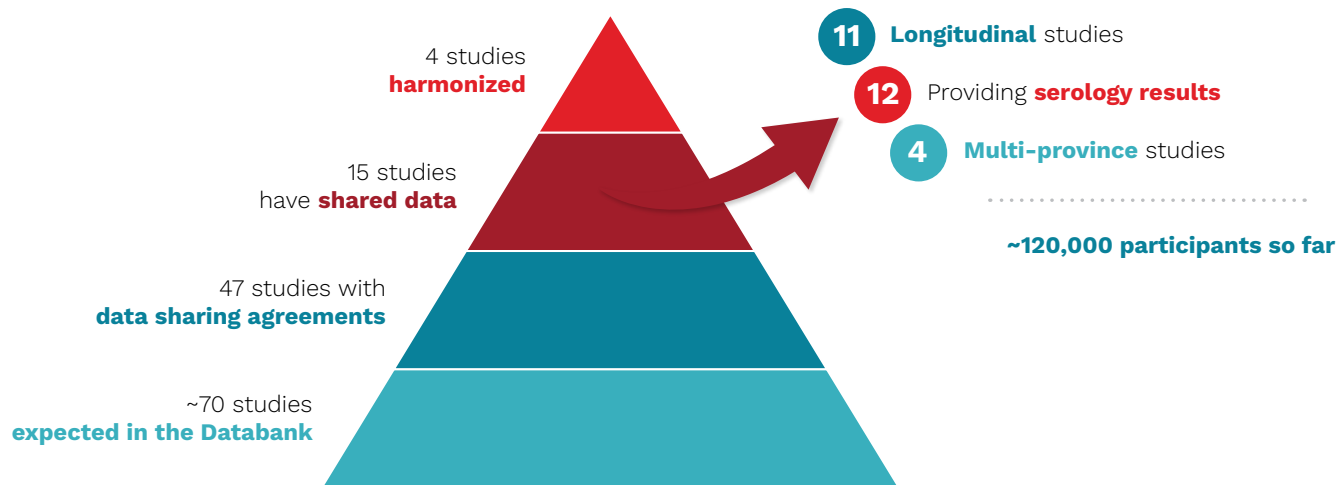
The **CITF Databank** standardizes, centralizes, and harmonizes individual-level data from participants in CITF-supported studies, making it accessible for further research. Examples of potential uses include:



The CITF Data Portal is open for access applications! Check out the **portal website** or **email us** to get your application started.

## CURRENT PROGRESS | SHARED DATA SO FAR

Over half of the studies expected to be added to the CITF Databank have begun the data sharing process and several have submitted individual-level data.



The studies which have shared data so far include many diverse populations, the majority of which are sharing serology measures.

Four studies have sampled from the general population. Other populations include: teachers and students, older Canadians, long-term care residents and staff, food industry workers, paramedics and people in correctional facilities.

### » LEARN MORE ABOUT THE STUDIES

.....

The CITF Databank will **continue to receive data** as studies are completed and aims to remain an important reservoir of COVID-19 data in the years ahead (stay tuned!).



.....

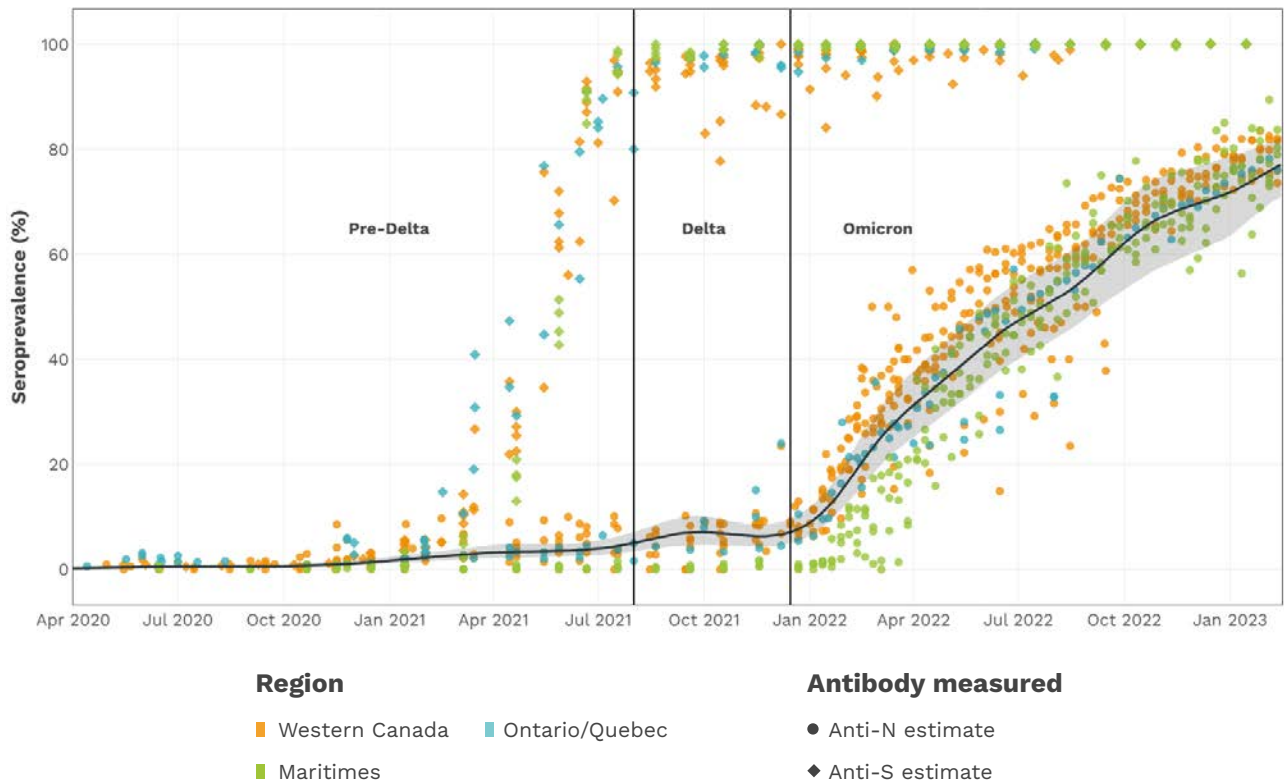
Open access, population-level seroprevalence estimates are currently available on the CITF Open Access Dataverse. For downloadable files and citation information, please visit **Open Data Dataverse**.



## SEROPREVALENCE IN CANADA | MID-FEBRUARY 2023 RESULTS

# Daily rate of infection slowed across Canada between July 2022 and mid-February 2023, but not among seniors

SARS-CoV-2 seroprevalence in Canada (April 13, 2020 to February 15, 2023)

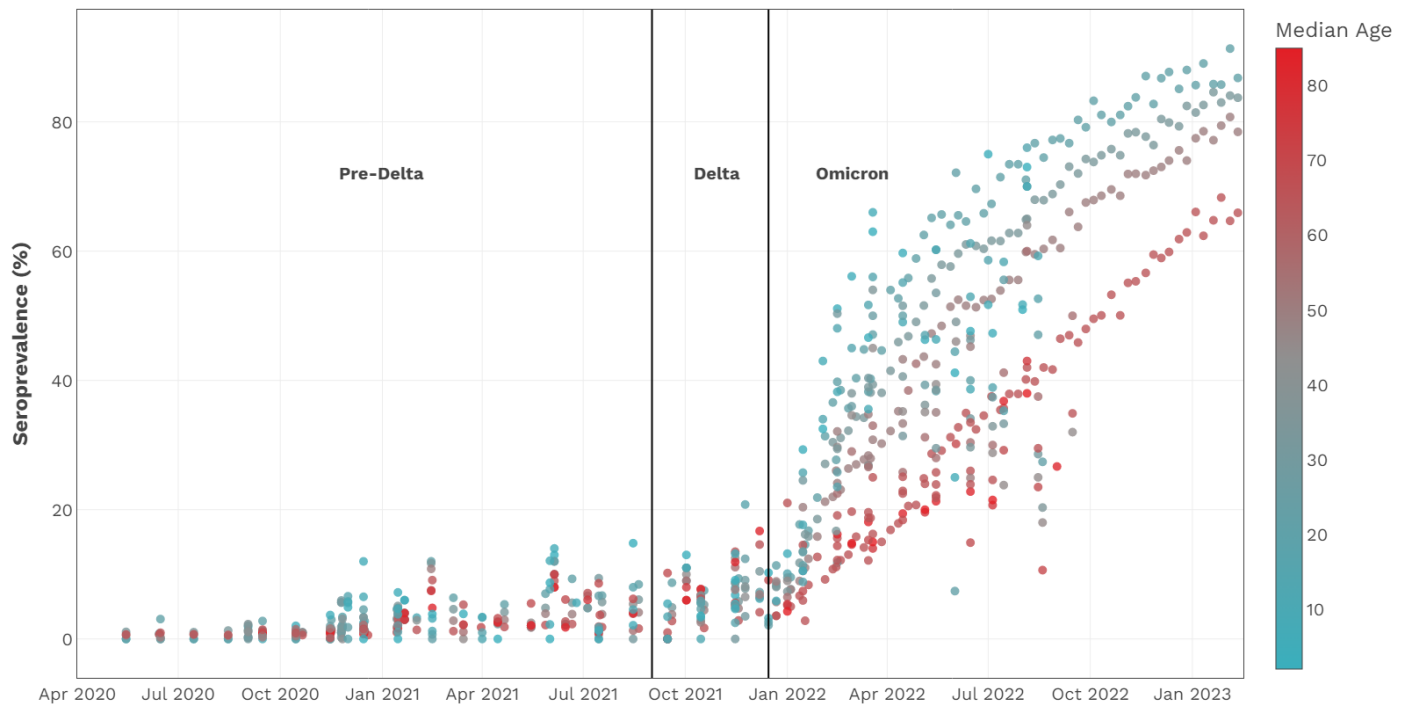


Overall, infection-acquired seroprevalence in Canada increased significantly between November 1, 2021, and February 14, 2023: from 6.4% (95% credible interval [CrI]: 4.5 to 8.9) prior to Omicron arriving in Canada to **77.0%** (95% CrI: 70.8 to 82.3) by mid-February 2023. We estimate this rise in seroprevalence during the Omicron phase of the pandemic corresponds to at least 27 million Canadians (95% CrI: 24.5 to 28.8) being infected between December 1, 2021, and January 31, 2023. 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.

The infection rate since Omicron emerged was equivalent to an average of about 70,000 infections per day in the first half of 2022 and has slowed to about **50,000 infections per day since July 2022.**



## Seroprevalence due to infection by age in Canada



Canadians aged 60+ have been less likely to have infection-acquired seroprevalence compared to younger age groups since the appearance of Omicron. This means fewer have hybrid immunity (a combination of antibodies due to vaccination and infection) than younger Canadians. That said, the rate of increase in infection-acquired seropositivity has been steadily increasing for older Canadians, according to data from Canadian Blood Services. The data suggest Canadians 60+ would do well to continue getting booster shots to maintain good immunity levels and take precautions to avoid infection.

» **READ MORE**

Data on our Seroprevalence in Canada webpage are updated at least once a month and can be visualized via interactive graphs.

Those looking for population-level data can now click on “Access the data” buttons throughout the page, leading to the new [CITF Open Access Dataverse](#).

» **DISCOVER**



*The CITF has funded several studies looking at factors affecting the protection conferred by vaccines including the recommended number of doses, optimal dosing intervals, and the rate at which antibodies wane. Moreover, these considerations are not one-size-fits-all, and vary according to many factors, including age. Two recently published papers explore some of these considerations.*

## **In people aged 50 years or older, booster doses sustain the protection against Omicron-related severe outcomes for at least three months**

A study published in *Nature Communications* found that a third and fourth dose of mRNA vaccine sustained the protection conferred against severe Omicron-related outcomes for at least three months in people aged 50 years or older. A fourth dose yielded even greater and longer-lasting protection than a third dose. The study was led by Dr. Jeffrey Kwong (University of Toronto), along with Drs. Kumanan Wilson and Deshayne Fell (University of Ottawa).

**» READ MORE**

## **In children, longer dosing intervals increase the effectiveness of vaccines but protection wanes fast**

In this study published in *Pediatrics*, research highlighted that two doses of the monovalent Pfizer-BioNTech mRNA vaccine yielded moderate protection against symptomatic SARS-CoV-2 infection, while protection against severe COVID-19 outcomes was much higher among children between the ages of five and 11. Initially, vaccine effectiveness was higher when the interval between the two doses was longer, but vaccine-induced antibodies waned quickly following each dose. This study was also led by Drs. Jeffrey Kwong (University of Toronto) and Kumanan Wilson (University of Ottawa).

**» READ MORE**



*People living with HIV have been among those at risk for more severe outcomes from COVID-19 because they are immunocompromised. Two recent studies from CITF-funded researchers indicate that they can achieve good protection by keeping up to date with vaccinations.*

## **Four doses of mRNA vaccine benefit people living with HIV receiving anti-retroviral therapy**

A study published in *AIDS*, demonstrated that fourth COVID-19 vaccine doses, whether they are monovalent or bivalent, benefit people living with HIV who receive anti-retroviral therapies, including those who have already experienced a SARS-CoV-2 infection. The study was a collaboration between Drs. Zabrina Brumme (BC Centre for Excellence in HIV/AIDS and Simon Fraser University), Mark Brockman (Simon Fraser University), and Marc Romney (University of British Columbia).

**» READ MORE**

## **Booster doses are efficient at mounting strong T-cell immune responses in people living with HIV**

In a paper published in *Viruses* the research team, led by Dr. Mohammad-Ali Jenabian (Université du Québec à Montréal), along with Dr. Aslam Anis (University of British Columbia), found that a third dose of COVID-19 vaccine induced robust cellular immune responses in people living with HIV – responses comparable to those observed in individuals without HIV.

**» READ MORE**







## COVID-19's youngest victims

At the beginning of the pandemic, COVID-19 was generally very mild in young children, creating a sense that most were not at risk.

Once Omicron struck, the millions of people infected led to increased numbers of serious cases, including in children. This included some rare yet serious and lingering complications. Furthermore, the rigorous process which took place before vaccines were approved for children caused delays in pediatric vaccination. Coupled with poorer vaccine uptake in young children, this has led to gaps in immune protection against COVID-19.

The CITF has funded 14 studies examining the impact of SARS-CoV-2 on pediatric populations, as well as vaccine efficacy and the durability of immune responses in children. Our final *Research Results & Implications* seminar, held on March 27, 2023, welcomed CITF-affiliated experts who discussed the current state of research on COVID-19 and pediatrics in Canada.

### KEY POINTS:

- 1 COVID-19 was uncommon in children until Omicron (beginning December 2021), at which point **most children became infected with SARS-CoV-2**. According to Montreal's EnCORE study, nine to 12 times more children and teens developed infection-acquired antibodies in the Omicron era than previously.
- 2 Children infected with Delta and Omicron exhibited **more symptoms** than those infected with the ancestral virus.
- 3 Risk factors for severe outcomes among youth who tested positive for SARS-CoV-2 in emergency departments were being **older** (aged 10 to 18), having underlying **chronic illness**, and having **symptoms** for a longer time.
- 4 While infection-acquired antibodies decline within a few months, **vaccine-induced antibodies remain indefinitely** (so far) in most children.





**5** Parents have been **less likely** to have their child vaccinated if the child already had COVID-19 and/or was younger. Adolescents (ages 12 to 18) were more likely to be vaccinated than younger children.

**6** **Vaccine safety** is the most significant parental concern affecting pediatric vaccination, suggesting that continued education and reinforcement are warranted.

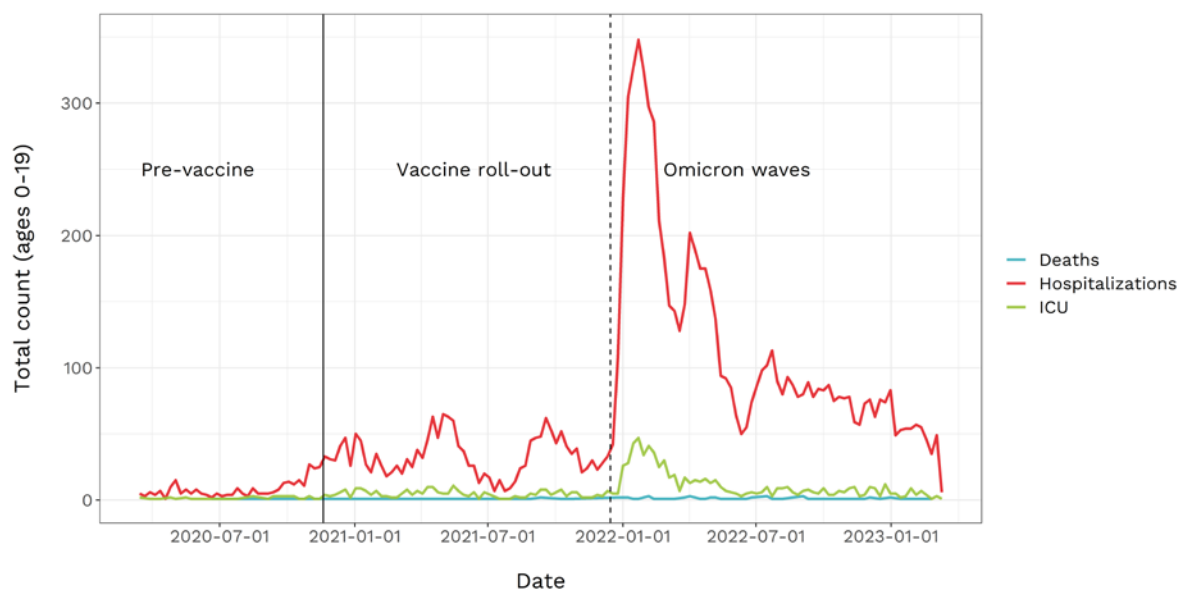
**7** Age (10 to 18 years), number (more than four) and severity (requiring hospitalization) of symptoms were associated with **long COVID** in children.

**8** Seroprevalence due to infection was **significantly higher** for children whose parents identified as a racial/ethnic minority and for whom the annual household income was less than \$100,000.

» **PRESENTATION & VIDEO**

## Seroprevalence and the effects of COVID-19 on children and adolescents

At the beginning of the pandemic, SARS-CoV-2 infections in children and adolescents in Canada were rare and generally very mild compared to adults. However, with the emergence of Omicron in December 2021, the weekly number of new COVID-19 cases in those under the age of 18 spiked to 55,956, accounting for 19% of the total number of COVID-19 cases in Canada. This change has been attributed to the increased transmissibility of Omicron and low vaccine uptake among children.



*Total number of deaths, hospitalizations, and ICU admissions in Canada due to COVID-19 in children under 19 years of age over the course of the pandemic.*

In this month's research synthesis, we surveyed research findings, including those funded by the CITF, to address the following questions:

- ▶ How many children have really been infected?
- ▶ Are there adverse outcomes following COVID-19 in children and what have they been?
- ▶ What are the factors affecting COVID-19 vaccine acceptance and uptake in children? What percentage of children have been vaccinated against COVID-19?
- ▶ Have there been adverse events after vaccination in children and, if so, what have they been?
- ▶ What do the CITF-funded experts in the field of pediatrics foresee as challenges with respect to COVID-19 among children?

» **READ MORE**







COVID-19  
IMMUNITY  
TASK FORCE

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



## ***Our Research Results & Implications seminars have come to an end***

Over the past two years, we have hosted **17 seminars** presenting the results and implications of CITT-funded studies. **Thousands of people** have tuned in to be informed and illuminated about our latest findings on COVID-19. We extend our sincere thanks to the **66 researchers and experts** who have participated in one or more of our seminars!

Visit our website to see all the presentations, videos, and summaries of the entire series.

**EXPLORE NOW**

**covid19immunitytaskforce.ca**



The views expressed herein do not necessarily represent the views of the Public Health Agency of Canada.