

Emerging scientific evidence

Prevalence- there is a wide range of estimates on the prevalence among previously infected individuals

- WHO reports 10-20% among those infected with COVID-19 will develop post COVID-19 condition
- Several studies (**before Omicron**) found that about 30% to 40% of people who weren't hospitalized for their initial COVID-19 infection still report symptoms beyond 12 weeks.
- A recent **systematic review and meta-analysis** (137 studies; up to Dec. 2021) [*SSRN Lancet prepub*] found:
 - prevalence of any long COVID symptom was 54% (95% CI: 34-73%) at 6 months and 54% (95% CI: 44-65%) at 12 months follow-up
 - neuropsychiatric symptoms showed a higher long-term prevalence and longer persistence than physical symptoms

Emerging scientific evidence – con't

Risk Factors and Effect of Vaccination

- **Females** appear to be disproportionately impacted
 - A recent [white paper](#) from the US found that 60% of those diagnosed with post COVID-19 condition were females (compared to 40% in males)
- A recent [systematic review and meta-analysis](#) found that risk factors included:
 - female sex
 - those who experienced severe acute COVID-19 or having been hospitalized for acute COVID-19 infection
- Preliminary research suggests that **vaccination (2 doses) may reduce the risk** of developing post COVID-19 condition if infected. (however, more research is needed as findings are based on a few studies)

Social Impact

- Evidence about the **impact on employment** is emerging
 - Based on a review of global studies:
 - between 9-22% of individuals were not working 3 months or more after acute infection
 - 10-46% had to reduce their work schedule

New variants

- Based on a new survey in the UK, the odds of self-reporting long COVID symptoms four to eight weeks after a first coronavirus (COVID-19) infection were 49.7% lower in infections compatible with the Omicron BA.1 variant than those compatible with the Delta variant among adults who were double-vaccinated when infected (Note: official definition of long COVID is 12 weeks +).

Findings from Canada so far...

- A recent [survey](#), supported by the Ministère de la santé et des services sociaux du Québec and was conducted in **health care workers in QC**, found that 40% among non-hospitalized cases and 68% among hospitalized cases had post COVID-19 condition 12 weeks after initial infection (*pre-print*)
- Another [study](#) that used retrospective chart reviews in a tertiary care setting in Toronto found that 27% of patients (of which 61% were outpatients and 39 percent were admitted to hospital) reported 2 or more persistent symptoms 90 days or more after a positive PCR test.
- A recent pan-Canadian [survey](#) (*non-peer-reviewed*) conducted by Viral Neuro Exploration (VINEx), COVID Long-Haulers Support Group Canada, and Neurological Health Charities Canada in March and April of 2022 among 1,050 individuals with post COVID-19 condition found that:
 - 88% have experienced long COVID symptoms for 12 weeks or longer (and 58% for more than a year)
 - 60% received a long COVID diagnosis from a health care provider
 - more than 87% of respondents identified as women.
 - Over 80% of respondents reported a negative or very negative impact of long COVID on their brain health, such as difficulty concentrating and thinking, sleep disturbances, memory loss, headaches, anxiety and depression
 - Close to 75% of those surveyed sought medical care for their neurological or psychiatric symptoms
 - nearly 70% of respondents had to take leave from work

... There is a lack of peer-reviewed research on post COVID-19 condition in Canada at this time. However, other studies and surveys are underway and results are forthcoming.

What we don't know – summary of key knowledge gaps

- What the underlying biological mechanisms are to fully estimate the health impacts of post COVID-19 condition and how to address them
- Unclear understanding of post COVID-19 condition impacts independent from broader impacts of the pandemic
 - E.g. impacts of the pandemic on mental health and long COVID symptoms related to mental health
- At this time, there is **no treatment** for post COVID condition.
- No clear preventative measures, aside from preventing initial COVID-19 infection. Some evidence on the protective effect of COVID-19 vaccination (2 doses) against PCC but evidence is limited
- Too early to determine the risk of post COVID-19 condition associated with different variants
- The **burden of post COVID-19 condition in Canada** is unknown
 - Proportion of population affected, across sub-groups, particularly among children, Indigenous populations, and racialized populations
 - Insufficient evidence to date to determine the socio-economic impacts of post COVID-19 condition and its impact on the healthcare system and the broader economy; however early work is on the way to generate first evidence of impacts in Canada

Understanding the impact of post COVID-19 condition

- **Canadian-specific data/research evidence** may not be available for some time
 - While the Canadian Institutes of Health Research (CIHR) anticipates additional research investments in the area of Long COVID, it may take several years for clear and robust results from these investments to be generated
 - Although preliminary findings from the Canadian COVID-19 Antibody and Health Survey is expected between August-October 2022; the final results will not be available until early 2023. In addition, depending on the survey response rates, prevalence information by specific subgroups of the population may not be available.
 - We may need to rely on emerging international evidence for the short-term
- Estimating the **socioeconomic impact** of post COVID-19 condition will be challenging
 - Current CIHR-funded research investments have mostly focused on clinical or biomedical research. Studies on socioeconomic impacts may not be covered.
 - Evidence gaps on post COVID-19 condition (i.e. prevalence, risk factors, pathophysiology, recovery trajectories and health care use, effect on work/caring roles, etc.), particularly in the Canadian context, will make it challenging to assess the socio-economic impacts of post COVID-19 condition in Canada
 - Work can start with the best available international evidence to date, and will then further refine once more robust estimates are available
- **Patient groups** are mobilizing, in Canada and internationally - calls for action from patient and health care organizations is expected

Current National Context

Burden of post COVID-19 condition in Canada – important gaps

- No robust estimates yet of how common post COVID-19 condition is in Canada, particularly among children, Indigenous populations, and racialized populations
- Insufficient evidence to date to determine the socio-economic impacts of post COVID-19 condition and its impact on the healthcare system and the broader economy (e.g. children returning to normal activities, adults returning to work, impact on caregivers, use of health care services, etc.)

A range of federal and PT activities underway

- PT activities include development of specialized treatment and recovery clinics, as well as research and monitoring initiatives
- Various Health Portfolio actions underway to address gaps, improve understanding and support FPT coordination of efforts (see overview on slide 10)

Current Health Portfolio Actions to Date: gathering and generating evidence and engagement

Funded Research

CIHR invested ~\$17.7M to fund 41 rapid response projects targeting post COVID-19 research

Additional post COVID-19 condition research projects have been funded through non-targeted competitions.

Surveillance

- Assessing data sources for surveillance of post COVID-19 condition in Canada
- Canadian COVID-19 Antibody and Health Survey (launched spring 2022)

Synthesize and Disseminate Evidence

- Best Brains Exchange (May 2021)
- Systemic reviews of scientific studies on prevalence, risk factors, preventative interventions
- Bi-weekly scans of new/emerging research
- Web content

Engagement & Collaboration

- Provincial and Territorial updates
- National health organizations/health professional associations
- Patient partnerships
- International - WHO, UK, GloPOD-R
- Engagement on economic modelling

Upcoming activities on post COVID-19 condition

- CIHR will continue to invest in research on the long-term effects of COVID-19 infections on Canadians, as well as the wider impacts of COVID-19 on health and health care systems.
- **PHAC to support data and public health surveillance and develop tools and guidelines**
 - In partnership with Statistics Canada, academic organizations, provinces and territories and the COVID-19 Immunity Task Force, developed and launched the Canadian COVID-19 Antibody and Health Survey in Spring 2022
 - First population survey on post COVID-19 condition in Canada will estimate the prevalence in adults in Canada and describe risk factors and examine the impact on overall health and daily functioning
 - A follow-up surveillance survey is planned in 2023
 - PHAC to continue seeking additional data sources from existing surveillance systems on post COVID-19 condition
 - In addition, PHAC will develop evidence-based guidelines adapted to the Canadian context for the identification, prevention and management (including models of care) of post COVID-19 condition

Examples of CIHR investments in Long COVID Research

- **CIHR** has already invested **\$17.7M** to fund **41 targeted research studies** on post COVID-19 condition
- **Canadian COVID-19 Prospective Cohort Study (CANCOV) (\$2.1M)**
 - Canadian research consortium studying the full scope of COVID health impacts and risk factors
 - Preliminary findings show a range of symptoms associated with post COVID-19 condition
 - Studying how post COVID-19 condition may cause longer-term disability and implications for Canadians who contracted COVID-19
- **Canadian Longitudinal Study on Aging (ongoing investment of \$8M per year)**
 - 20+ year long research tracking the health of > 50,000 Canadian adults
 - In 2020 pivoted to study the effects of COVID-19 on older adults, studying physical and mental health impacts, and changes to access to healthcare services
- **COVID-19 Evidence Network to support Decision-making** and the **Strategy for Patient-Oriented Research Evidence Alliance** are reviewing the best-available evidence about [care models for people living with post COVID-19 condition](#)

PHAC Current Surveillance Activities

Measure and monitor magnitude and impact of post COVID-19 condition and related symptoms in Canada, in partnership with Statistics Canada, academic organizations, and provinces and territories.

Canadian COVID-19 Antibody and Health Survey (Spring 2022)

First population survey on post COVID-19 condition in Canada will:

- Estimate the prevalence of post COVID-19 condition in adults in Canada
- Describe risk factors and the range, prevalence and duration of symptoms reported
- Examine the impact of post COVID-19 condition on overall health and daily functioning

How:

- Collaboration PHAC\Statistics Canada\Canadian Immunity Task Force (CITF)
- The target sample is 100,000 randomly selected Canadians aged 18+ across the 10 provinces
- CITF is leveraging the survey to include Dried Blood Spot (DBS) test kits to test for infection-acquired and/or vaccine-induced antibodies to SARS-CoV-2. Respondents who choose to conduct the DBS test component will receive a personalized report of their results.
- Data collection ongoing until June 2022. Preliminary results expected between August-October 2022; the final results will be released in early 2023

Assessing other data sources for surveillance of post COVID-19 condition in Canada

- Use of electronic medical records data and existing surveillance systems for chronic diseases
- Post COVID-19 condition in children in Canada: a Canadian Paediatric Surveillance Program Study (in development)

PHAC Current Evidence Synthesis & Dissemination

Ongoing scans of evidence and policy responses

- Biweekly scans of new / emerging research on post COVID-19 condition
- COVID-END/SPOR Living Synthesis – potential role for regular updates on long COVID

Rapid reviews and evidence briefs (PHAC / PHAC-funded)

- Living evidence brief on the associations and safety of COVID-19 vaccination and post COVID-19 condition
- Update 1 – April 14, 2022 (currently being finalized for distribution in this week's tracker)

Systematic reviews (PHAC)

- [Risk factors and preventative interventions for post COVID-19 condition: living systematic review \(Pre-print March 2022\)](#)
- [Prevalence of long-term effects in individuals diagnosed with COVID-19: a living systematic review \(Pre-print June 2021; under peer-review\)](#)

Knowledge exchange and translation events and products

- Best Brains Exchange (May 2021)
- Web content on Canada.ca

Les données probantes au Canada jusqu'à présent...

- [Une enquête récente](#), soutenue par le Ministère de la santé et des services sociaux du Québec et menée auprès de travailleurs de la santé au Québec, a révélé que 40 % des cas non hospitalisés et 68 % des cas hospitalisés présentaient le syndrome post-COVID-19 12 semaines après l'infection initiale. (Préimpression)
- [Une autre étude](#), qui s'est appuyée sur l'examen rétrospectif des dossiers dans un établissement de soins tertiaires de Toronto, a révélé que 27 % des patients (dont 61 % étaient des patients ambulatoires et 39 % étaient hospitalisés) ont signalé 2 symptômes persistants ou plus 90 jours ou plus après un test PCR positif.
- [Une enquête récente](#) pancanadienne (non évaluée par des pairs) menée par « *Viral Neuro Exploration (VINEx)* », « *COVID Long-Haulers Support Group Canada* » et « Les Organismes caritatifs neurologiques du Canada » (OCNC), en mars et avril 2022, auprès de 1050 personnes souffrant du syndrome post-COVID-19 a révélé que:
 - 88 % ont connu des symptômes de la COVID longue pendant 12 semaines ou plus (et 58 % pendant plus d'un an).
 - 60% ont reçu un diagnostic du syndrome post-COVID-19 de la part d'un prestataire de soins de santé
 - Plus de 87% des répondants se sont identifiés comme des femmes.
 - Plus de 80% des répondants ont signalé un impact négatif ou très négatif du syndrome post-COVID-19 sur leur santé cérébrale, comme des difficultés de concentration et de réflexion, des troubles du sommeil, des pertes de mémoire, des maux de tête, de l'anxiété et de la dépression.
 - Près de 75 % des personnes interrogées ont eu recours à des soins médicaux pour leurs symptômes neurologiques ou psychiatriques
 - près de 70% des répondants ont dû prendre un congé professionnel.

... Il y a un manque de recherche évaluée par les pairs sur le syndrome post-COVID-19 au Canada à l'heure actuelle. Cependant, d'autres études et enquêtes sont en cours et les résultats sont à venir.