

# Long COVID Web: Year One in Building a Dynamic Network



## 2023 Year In Review

March 2024



LONG COVID WEB

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## ► Introduction

Dear Colleagues,

On behalf of the leadership and members of our national Long COVID Web (LCW) network, we are delighted to share highlights of activities and progress since our launch in the Spring of 2023. We have been engaged in a large-scale team effort, building the foundation for improving the science and its applications for people living with Long COVID (LC), or post COVID condition (PCC). Thanks to our major funders, the Canadian Institutes of Health Research (CIHR), and our partners contributing funding and in-kind support, for this privilege to address one of the biggest global health challenges of our lifetime. Our ambitious program of work will advance scientific exploration, discovery, and partnership, securing solutions that contribute to realizing our vision – Canada without Long COVID.

Sincerely,

Drs. Angela Cheung, Simon Décary, Piush Mandhane, and Adeera Levin (Executive Committee)



**Dr. Angela Cheung**

Professor of Medicine,  
University Health  
Network / University of  
Toronto



**Dr. Simon Décary**

Professor of  
Rehabilitation,  
Université de  
Sherbrooke



**Dr. Piush Mandhane**

Professor of Pediatrics,  
University of Alberta



**Dr. Adeera Levin**

Professor, Nephrology  
and Internal Medicine,  
University of British  
Columbia

## Getting Started

LCW was formed to combat a serious threat to the health of Canadians – PCC or LC. Once our successful CIHR grant application was announced in Spring 2023, we moved quickly to reaffirm LCW's mission and vision – **Canada without Long COVID** – and assembled an operations team as well as creating a governance structure and developing processes that emphasized diversity and inclusivity. Clinicians, health system leaders, patients, partner organizations, and scientists across Canada enthusiastically responded to calls to support critical network activities to establish a culture of collaboration and communication that would extend across disciplines, regions, communities, and people to stimulate novel research and accelerate knowledge mobilization.





## ► Vision and Mission



**VISION**  
Canada  
without PCC



**ACCELERATE**  
the discovery  
& validation  
of Canadian-  
led sciences  
in PCC



**ACTIVATE**  
a learning  
health system  
that prioritizes  
the needs of  
individuals  
with PCC and  
family  
members



**IDENTIFY**  
the best  
therapeutics  
& practices, &  
accelerate  
equitable  
access to  
PCC care



**MAINTAIN**  
rigorous  
surveillance  
of the impact  
of PCC

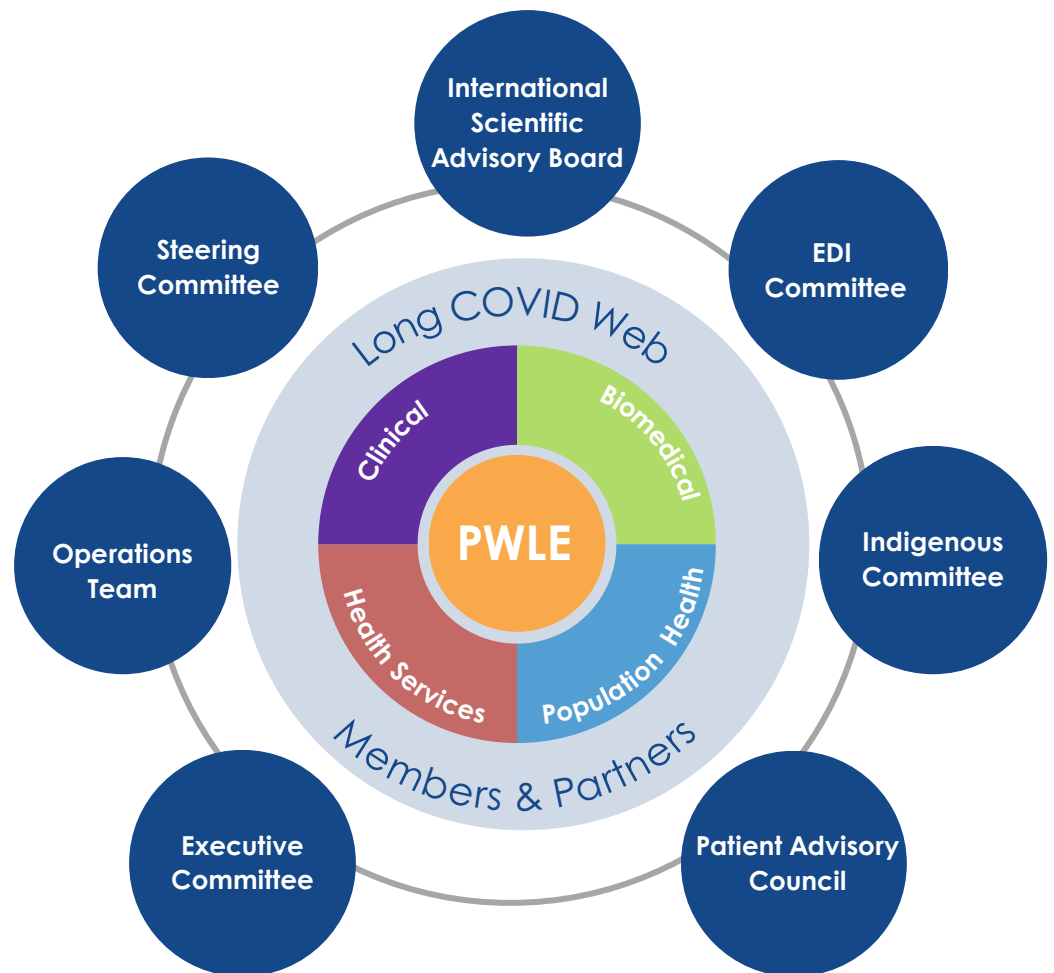
## ► Our Structure

LCW's organizational structure emphasizes the pivotal role that diverse committees and research pillars have in fostering inclusive collaboration, research, and innovation.

**People with lived experience (PWLE) are central** to what we do and how we work – their contributions ensure LCW's approach to understanding and addressing the complexities of Long COVID is grounded in what matters to the people who are affected the most.

### Our research pillars are:

- 1) Biomedical, 2) Clinical, 3) Health Services, and 4) Population Health.

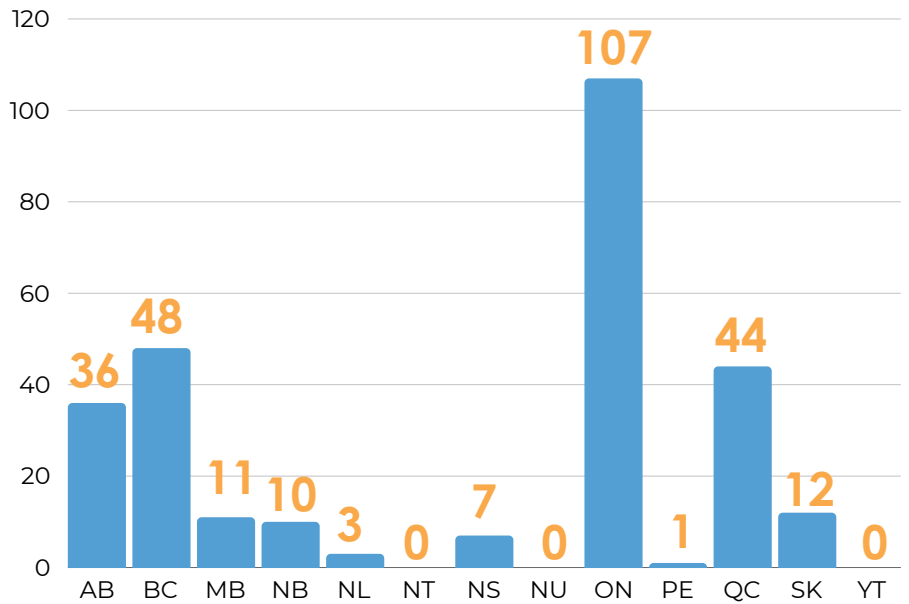


LONG COVID WEB

## ► Our Members: 679 Total

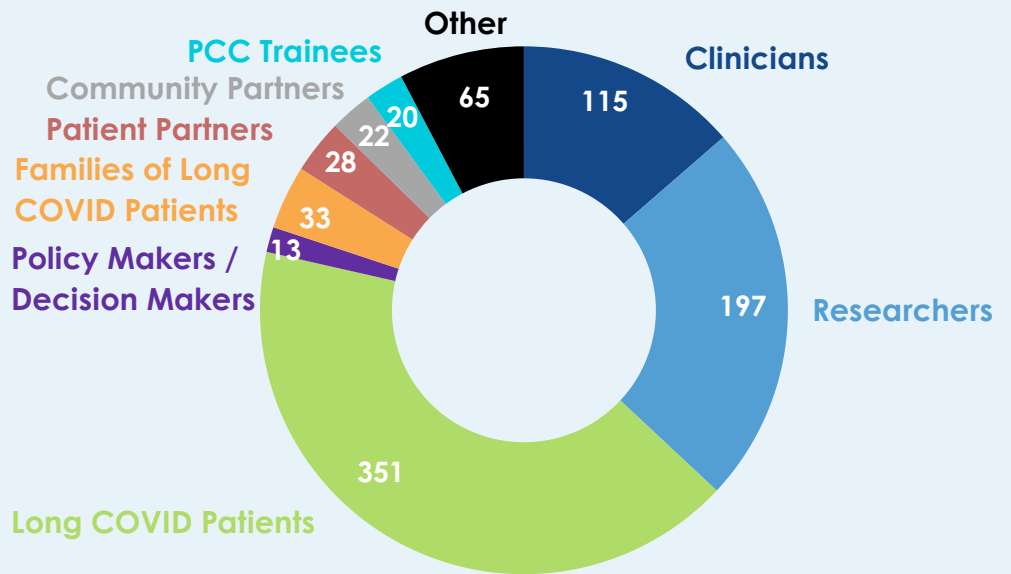
### By Province\*

\*Based on member responses to equity, diversity and inclusivity survey questions (n=279).



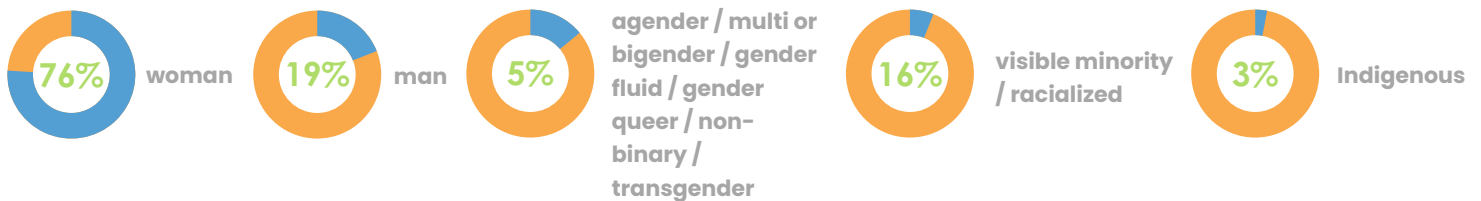
### By Member Group\*\*

\*\*Members can identify with multiple groups. We also have our membership spread across our four research pillars: biomedical (84), clinical (109), health services (98), and population health (105).



### By Communities or Populations Experiencing Inequities

Of the 279 members who responded to the equity, diversity and inclusivity survey questions on our member survey, they reported as identifying as a:



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LCW's membership reflects our commitment to engage with the necessary range of individuals and groups from across Canada. We know that diverse perspectives and collaborations are needed to co-develop timely and innovative solutions that best support PWLE of Long COVID and their caregivers.

## ► Our Partners

We advanced our mission in Year 1 thanks to the stability and support of a robust network of strategic partners. This wide array of Canadian and international partnerships provides the expertise, perspectives, and collaborative power necessary for a comprehensive yet focused approach to Long COVID research and innovation and enables us to rapidly share knowledge with diverse knowledge users across the country.



45

Research Networks, Societies & Organizations



26

Ministries of Health & Health Services Organizations



6

Clinical Trials & Health Studies



3

Biobanks



4

Institutes



3

Patient-Oriented Research Networks



3

Patient Organizations



2

Industry Partners



4

Organizations Offering Both In-Kind & Cash Support



CAN-PCC

### CANADIAN GUIDELINES FOR POST COVID-19 CONDITION

LCW works in partnership with [CAN-PCC](#), a national Long COVID initiative which develops and implements evidence-based guideline recommendations. CAN-PCC is led by the Michael G. DeGroot Cochrane Canada Centre team at McMaster University with financial support from the Public Health Agency of Canada. Several members of the LCW leadership team were selected as members of varying CAN-PCC working groups, and similarly, several CAN-PCC members are on LCW committees and working groups. This allows efficient collaboration to coordinate efforts to advance Long COVID research, and knowledge mobilization.



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## ► Collaborated with People with Lived Experience (PWLE)

From its inception, LCW has prioritized and embraced collaborations and partnerships with PWLE from across the country. PWLE are integral to a relevant, responsive, and effective research network. PWLE not only bring their experiences living with Long COVID to specific network activities, they also bring diverse knowledge and expertise from their lives at large that are relevant to realizing LCW's mission.

### How PWLE Were Engaged in 2023

- ✓ PWLE advised in the conception of LCW, assuring the original CIHR grant application included PWLE's concerns.
- ✓ The 8-12 member Patient Advisory Council (PAC), which includes heads of national support groups and strong leadership, met bi-weekly. Members come from 5 provinces and 1 territory and include PWLE and a parent of a child living with LC.
- ✓ PWLE's voices are woven throughout all aspects of the network's activities, including: on research projects; on LCW committees; and via PAC.

### Contributions of PWLE to LCW

- PWLE contributed to naming LCW and altered its code of conduct to emphasize the importance of inclusion of experience and accountability for respectful behaviour.
- PAC had substantive influence throughout the research network with an approach to research-patient collaborations that developed innovative engagement mechanisms. One significant and novel area of influence was with the LCW granting process. PAC's input changed the design and awarding of LCW's grants. The granting approach was modified in terms of the process of grant review and weighting of decisions following discussions with PAC members. **Prior to scientific peer review, PAC scanned all grant applications for relevance, PWLE involvement and issues, and diversity. After peer review, PAC revisited in depth all \$100,000 applications to provide a score that could affect the ranking, as well as feedback to each team on specific content and potential caveats (e.g., aspects missing in data collection). Feedback was also provided for all other applications after the funding decision.**
- PAC has had strong input into the design and information included in LCW's website.



"Long COVID Web offers more than lip service to people with lived experience. They actually listen and make changes." ~  
PAC Leadership



## ► Supported Research Across The Spectrum

In Year 1, LCW focused on co-identifying important gaps and supporting research and researchers to accelerate discovery of innovative solutions across the four research pillars.

### Determined Research Priorities Together

LCW is committed to steering the course of Canadian research to address the multifaceted dimensions of Long COVID. One of our first initiatives was to collectively establish research priorities for the Canadian context. The staged prioritization process, which involved two survey rounds and an in-person meeting, resulted in 12 priorities spanning our four research pillars – biomedical, clinical, health services, and population health research. Outlined below, you will see the priorities related to each of our four pillars.

Pillar	Priorities
<b>1</b> Biomedical	<ul style="list-style-type: none"><li>• Evaluation of viral persistence, difference between viral strains and clinical/biological phenotypes correlations</li><li>• Develop and validate markers of neuroinflammation</li><li>• Develop and validate markers of autoimmunity</li></ul>
<b>2</b> Clinical	<ul style="list-style-type: none"><li>• Establish consistent definitions for Long COVID</li><li>• Validate and establish diagnostic tools</li><li>• Conduct clinical trials to test interventions</li></ul>
<b>3</b> Health Services Research	<ul style="list-style-type: none"><li>• Characterize subtypes and phenotypes of Long COVID</li><li>• Examine disparities, including socioeconomic and ethnic/racial disparities, etc. in healthcare utilization</li><li>• Develop national recommendations for rehabilitation pathways for persons with Long COVID</li></ul>
<b>4</b> Population Health	<ul style="list-style-type: none"><li>• Establish collaboration in the form of data sharing across PHAC, Stats Canada, and different provinces to merge the minimal data set into their current surveys</li><li>• Identify and estimate the (1) healthcare, (2) societal and (3) patient-level costs associated with PCC over the short and long term</li><li>• Identify and evaluate supports and strategies to help people return to work or sustain work (e.g., supports and accommodations)</li></ul>





## ► Strengthened Long COVID Research Capacity

LCW's priorities focused our research funding on urgent needs. LCW awarded \$2.1M CAD in 2023 to foundational research projects and seed grants. Foundational projects (\$100,000/project), each driven by a research pillar, bring together multiple disciplines to address a key gap that once filled, will immediately support important research. Twenty-three cross-pillar seed funding projects, awarded in amounts of \$25,000, \$50,000, and \$100,000, addressed all 12 LCW research priorities and attracted an additional \$492,000 in matched funding and \$420,000 in in-kind contributions. Seed grants were awarded through a peer review process.

Pillar	Foundational Projects Responding to LCW Research Priorities
<b>1</b> <b>Biomedical</b>	<b>Preclinical Models as a Platform for Discovery and Validation of Biomarkers and Therapeutic Targets for Long COVID addresses:</b> <ul style="list-style-type: none"> <li>Investigate host and viral factors in pathogenesis of PCC</li> <li>Develop and validate biomarkers for PCC</li> </ul>
<b>2</b> <b>Clinical</b>	<b>Establishing a Core Outcome Set with Measurement Properties for Use in Long COVID Research and Practice addresses:</b> <ul style="list-style-type: none"> <li>Framework of measurement, including a core set of outcomes and their measurement properties for use in Long COVID research and practice among people living with Long COVID and caregivers</li> <li>Considerations for outcome measurement in the context of Long COVID</li> </ul>
<b>3</b> <b>Health Services Research</b>	<b>Improving Identification of Canadians Living with Long COVID in Administrative Data addresses:</b> <ul style="list-style-type: none"> <li>Establish consistent definitions and core outcome sets</li> <li>Co-develop, validate and adapt case finding algorithms across multiple jurisdictions, populations and type of data</li> </ul>
<b>4</b> <b>Population Health</b>	<b>Delphi Process: To Create a Consensus-Based Minimal Data Set to Access Long COVID Data addresses:</b> <ul style="list-style-type: none"> <li>Establish a National Patient Registry for ongoing clinical and research purpose</li> </ul>

## Supported Trainees' Growth

LCW also supported the future of LC research. In 2023, trainees received travel grants, awards, and assistantships/fellowships totalling **\$291,964**. Student poster presentations were also a highlight of the 1st Canadian Symposium on Long COVID.



### Poster Presentations

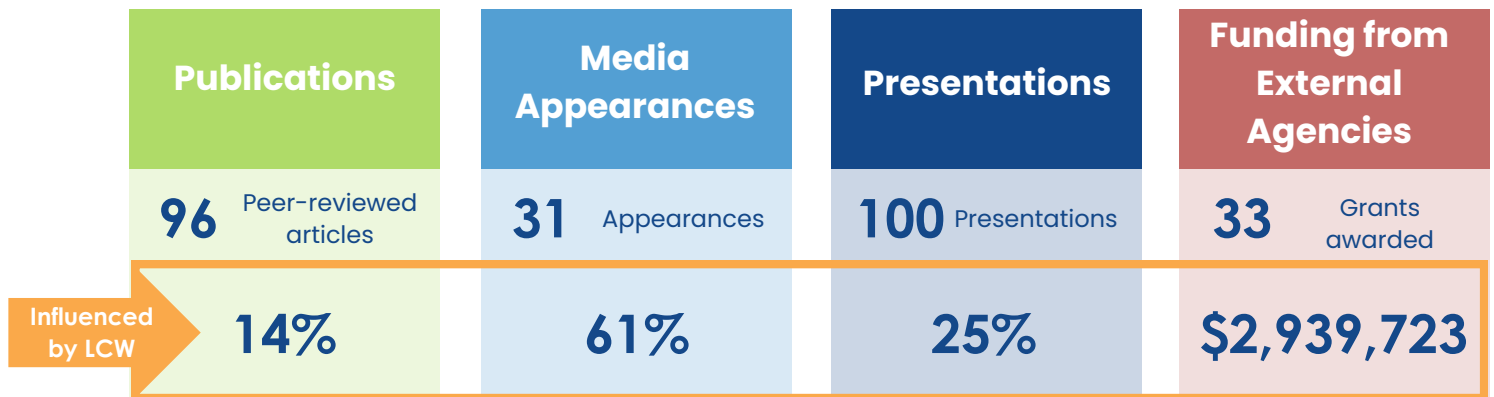
- **48** Posters (in-person and virtual)
- **10** Trainee Poster Excellence Recognition Awards
- **3** Top Trainee Poster Awards

## ► Our Members' Research Contributions

LCW members across the four research pillars have been active in 2023, making valuable contributions to advance Long COVID knowledge and secure new funding to strengthen our response to this national and global problem. Their expertise has also led to opportunities to speak to knowledge users and the public.

### By the Numbers

A review of a small sample (47 researchers) of our members' new research activity in 2023 indicated:



### Exemplars of Research Contributions in 2023

LCW is focused on responding to questions about diagnosing and assessing, managing and treating, and accessing health and social services for Long COVID.

**Below are exemplars of how our members' published work in 2023 aligned with these priorities.**

#### Diagnosis and Assessment

**Proteomic evolution from acute to post-COVID-19 conditions.** Journal of Proteome Research. Open Access: DOI: 10.1021/acs.jproteome.3c00324

**Sequential multi-omics analysis identifies clinical phenotypes and predictive biomarkers for Long COVID.** Cell Reports. Medicine. Open Access. DOI: 10.1016/j.xcrm.2023.101254

#### Management and Treatment

**Vaccination after developing long COVID: impact on clinical symptoms, inflammatory markers and viral persistence.** International Society for Infectious Diseases. Open Access. DOI: 10.1016/j.ijid.2023.09.006

**Assessing common and potentially modifiable symptoms of the post COVID-19 condition (Long COVID) in adults.** Canadian Medical Association Journal. Open Access. DOI: 10.1503/cmaj.220823

#### Access to Health and Social Services

**Evaluating a learning health system initiative: lessons learned during COVID-19 in Saskatchewan, Canada.** Learning Health Systems. Open Access DOI: 10.1002/lrh2.10350

**A learning health system for Long COVID care and research in British Columbia.** New England Journal of Medicine Catalyst Innovations in Care Delivery. Open Access. DOI: 10.1056/CAT.23.0120

**"None of us are lying": an interpretive description of the search for legitimacy and the journey to access quality health services by individuals living with Long COVID.** BMC Health Services Research. Open Access. DOI: 10.1186/s12913-023-10288-y

The team at BC Centre for Disease Control (including Dr. Naveed Zafar Janjua) developed **an algorithm** to identify people with LC in healthcare databases that is being refined for application in other provinces to identify and address care gaps.

## ► Committed to Knowledge Mobilization

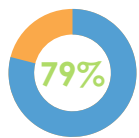
LCW leaders and members are committed to rapidly, effectively, and equitably disseminating the knowledge generated from within the network, as well as sharing evidence that has been produced from the more global scientific effort, with the intention of informing decisions and actions in research, policy, and practice. LCW amplifies its work and that of other partner organizations working in this area, such as the McMaster-based CAN-PCC team.

### Meetings & Events

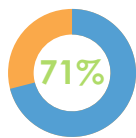
LCW prioritized a variety of methods to disseminate and mobilize Long COVID knowledge.

- **The 1st Canadian Symposium on Long COVID** was held September 20–21, 2023 in Montréal, Québec. This in-person and virtual event brought 600+ attendees (a mix of researchers, clinicians, patients and health system decision makers) together for oral and poster presentations and discussions spanning biomedical, clinical, health services and population health research. Post-symposium survey respondents indicated an overwhelmingly positive experience in terms of meeting individual learning objectives and improving awareness of current Long COVID research and knowledge across all pillars.

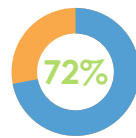
- **Survey highlights include:**



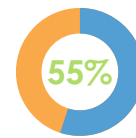
of respondents who attended agreed that the Symposium raised awareness and use of LC evidence and trends



of those with organizational affiliations felt that the Symposium raised awareness of LC in their organizations



had already shared information from the Symposium with others



agreed they had already or planned to use the knowledge from the Symposium to inform personal decisions/actions

- **Partner Network Meetings:** LCW hosted five “Partner Network Meetings” where 35 partner networks presented to provide their network updates on Long COVID research and to facilitate connections.
- **Monthly Webinars:** LCW initiated a series of monthly public scientific webinars on current or emerging evidence on pertinent topics. The first two sessions drew a total 256 attendees, and online recordings were viewed 370 times.
- **Townhalls:** LCW hosted three public ‘townhall’ meetings to provide updates on network progress. A combined 300 people attended, with 215 views of online recordings.

### Communications & Website

- **Built our team, structure and processes:** We established dedicated knowledge mobilization and communication leads and support personnel, including students, who galvanized efforts to promote our work as well as major Canadian and international events pertaining to global Long COVID health discoveries on Facebook, Twitter and YouTube.
- **Website:** A preliminary website was launched with basic network information and resources.



## ► Built Relationships Across The Network


“A network like Long COVID Web really facilitates collaboration across disciplines, across the country and internationally. I think it also really helps us to collaborate with the people who are most affected – the individuals living with Long COVID and their family caregivers.” ~ **Dr. Jill Cameron**

“I think that Long COVID Web – and the work that we will do together – has the potential to change the way research is done in Canada.” ~ **Dr. Gary Groot**

“There is collaboration in terms of knowledge sharing, but also, the sharing of data, sharing of samples and pulling from our cohorts. So that we can have more meaningful, larger-scale information coming out of our research. I could certainly see this infrastructure informing my other research projects that go beyond Long COVID. Because you know, collaboration is the name of the game.” ~ **Dr. Emilia Liliانا Falcone**


Meaningful connections and collaborations are at the heart of a dynamic and effective research network. The success of LCW hinges on new collaborations between different groups across the country to advance novel research and rapidly mobilize knowledge into practice and policy.

**Our first-year initiatives have leveraged diversity and contributed to strengthening and expanding the reach of connections and collaborations:**



### Collaboration

Research priorities were collaboratively developed and selected by engaging the breadth of LCW member groups.



### New & Existing Relationships

The 1st Canadian Symposium on Long COVID provided opportunities to establish and strengthen relationships. Of the in-person attendees who completed our post-Symposium survey:

- 65% made new meaningful connections and strengthened existing relationships across a variety of groups, including patients, clinicians, researchers.
- 68% intended to reconnect and 45% had already reconnected with others from the Symposium.
- Top reasons for reconnecting included: knowledge exchange, research projects, and collaboration opportunities.



### Interdisciplinary Research

The 2023 seed funding opportunity aimed to spark new and diverse collaborations across research pillars. Of the successful applications, 47.8% span two research pillars and 47.8% span three pillars, emphasizing the interdisciplinary nature of the initiatives.





## ► Stepping Into Year 2

We've accomplished a lot. But we've learned even more.

### **Building upon our foundational work in 2023, we will:**

- ✓ • **Develop research collaborations** with Indigenous communities, populations experiencing inequities, and industry.
- ✓ • **PAC will continue to be open and get broad representation to fill membership gaps related, but not limited, to:**
  - Geographical location (e.g., Atlantic Canada)
  - Rural/remote communities
- ✓ • **Broaden knowledge mobilization approaches**, methods and audiences to promote emerging evidence and raise awareness for practice and policy via:
  - A monthly newsletter and a revised and enhanced website.
  - A knowledge mobilization plan co-developed with pillar leads and committees for rapid dissemination of new findings.
  - Promotion of mentorship and evidence-based care in clinical practice through our national ECHO community of practice.
  - Support for equity and diversity in knowledge mobilization.
- ✓ • **Assess the impact** of the network by:
  - Engaging members and partners.
  - Co-identifying the important areas and best ways of assessing LCW's impact.



► Appendices

**Appendix A – Patient Advisory Council Members by Province**



People with Lived Experience



Long COVID Web Support Staff



LONG COVID WEB

## Appendix B – Projects Funded by LCW Seed Funding Competition

<b>\$100,000 Project Title [Nominated Principal Investigator (NPI)]</b>	<b>Cross-Pillar Collaboration</b>
A Randomized Phase 2 Dose Ranging, Active Control Trial of Using a Sequential Rebreathing Oxygen Mask (Hi-OxSR) to Increase PCO2 for the Treatment of Post COVID Cognitive Dysfunction (RECLAIM-Hi-OxSR) [Angela Cheung]	Pillars 1, 2, 3 & 4
Autoimmunity underlying long-term Neurocognitive symptoms post-COVID-19 (AINEC) [Manali Mukherjee]	Pillars 1, 2 & 3
Co-Designing a Pan-Canadian Long COVID Patient Navigation Model [Marina Wasilewski]	Pillars 2 & 3
Cognition and Brain MRI in Long COVID POTS: Effects of Blood Volume Expansion [Satish Raj]	Pillars 1 & 2
Dapagliflozin for long COVID syndrome [David Ian Paterson]	Pillars 1, 2 & 3
Derivation, validation and user testing of a clinical prediction rule for the early identification of patients at risk for developing the Post-COVID-19 Condition in patients presenting to emergency departments with an acute SARS-CoV-2 infection [Patrick Archambault]	Pillars 2, 3 & 4
Investigating Post-COVID Condition Among People Experiencing Homelessness: A Longitudinal Cohort Study Analysis [Stephen Hwang]	Pillars 2 & 3
Learning Best Practices from Integrated Care Models for Long COVID in Canada [Simon Décary]	Pillars 2, 3 & 4
LongPROM study - Development of a Long COVID patient-reported outcome measure (PROM) for clinical setting [Maxime Sasseville]	Pillars 2 & 3
Neuro-Thrombo-Inflammation and Corticosteroid Treatment In Long Covid [James (Jim) Russell]	Pillars 1 & 2
Nirmatrelvir/ritonavir (Paxlovid) in the prevention of long-term cardiovascular outcomes: The paxlovid Effectiveness For the prEvention of loNg covid (DEFEND) clinical trial [Kieran Quinn]	Pillars 2, 3 & 4
RECLAIM (REcovering from COVID-19 Lingering symptoms Adaptive Integrative Medicine) Trial: Hyperbaric Oxygen Therapy (HBOT) Internal Pilot Study [George Tomlinson]	Pillars 1 & 2



## Appendix B (Continued)

<p style="text-align: center;"><b>\$50,000 Project Title</b></p>	<p style="text-align: center;"><b>Cross-Pillar Collaboration</b></p>
<p>A living systematic review &amp; network meta-analysis of interventions for post COVID-19 condition [Dena Zeraatkar]</p>	<p>Pillars 2 &amp; 3</p>
<p>Developing and validating a short-form of the post-covid 19 stigma questionnaire in Indigenous and non-Indigenous communities [Ron Damant]</p>	<p>Pillars 2, 3 &amp; 4</p>
<p>Development of a Framework to Inform Equitable and Inclusive Models of Care for People with Long COVID [Linda Li]</p>	<p>Pillars 3 &amp; 4</p>
<p>Evaluation of leaky gut and viral persistence associated with immune dysregulation in distinct cohorts to identify new biomarkers of long COVID [Emilia Liana Falcone]</p>	<p>Pillars 1, 2 &amp; 3</p>
<p>Exploring the impacts and nature of post-exertional malaise among individuals with long COVID participating in a physical rehabilitation trial: A mixed-method study [Tania Janaudis-Ferreira]</p>	<p>Pillar 2</p>
<p>Identification of a Long-COVID Proteomic Signature(s) to Determine Therapeutic Interventions: A Propensity Score Matched, Targeted Proteomics, Exploratory Study [Douglas Fraser]</p>	<p>Pillars 1, 2 &amp; 3</p>
<p>Improving identification of people living with Long COVID [Naveed Z. Janjua]</p>	<p>Pillars 2, 3 &amp; 4</p>
<p>Targeting Taurine as a Potential Therapy for Long COVID: Use of a Validation Biomarker Cohort [Gavin Oudit]</p>	<p>Pillars 1, 2 &amp; 3</p>
<p>The Development of a Pan-Canadian Cohort of Children and Adolescents with Long COVID [Piush Mandhane]</p>	<p>Pillars 1, 2 &amp; 3</p>
<p style="text-align: center;"><b>\$25,000 Project Title</b></p>	<p style="text-align: center;"><b>Cross-Pillar Collaboration</b></p>
<p>Remotely delivered, Education and Strategies intervention for improving coping and symptom self-management in individuals with PCC [Robin Green]</p>	<p>Pillars 2 &amp; 3</p>
<p>Using Electroencephalography to identify Biomarkers of Post COVID-19 Condition Symptomatology [Marie-Hélène Boudrias]</p>	<p>Pillars 1 &amp; 2</p>



# Appendix C – Trainee Poster Awards

## Top Three Trainee Poster Awardees

- **1st place: Maryam Nayerabadi**, Montreal Clinical Research Institute (IRCM), Vaccination after developing long COVID: impact on clinical symptoms, inflammatory markers, and viral persistence
- **2nd place: Florent Besnier**, Montreal Heart Institute, Effects of Cardiopulmonary Rehabilitation on Cardiorespiratory Fitness and Clinical Symptoms in Long-COVID-19 Syndrome: Results from the COVID-Rehab Randomized Controlled Trial
- **3rd place: Mobin Khoramjoo**, University of Alberta, Sequential Multi-omics Analysis Identifies Clinical Phenotypes and Prognostic Biomarkers for Long COVID

## Poster Excellence Recognition Awards (by alphabetical order)

- **Gözde Filiz**, PhD student, Université du Québec à Trois-Rivières, Multisensory olfactory training: A novel training for long-term olfactory loss post COVID-19
- **Lyvia Fourcade**, Postdoctoral Fellow, Montreal Clinical Research Institute (IRCM), Persistence of SARS-CoV-2 spike 1 in circulating CD66b+ monocyte subpopulations in individuals with post-COVID-19 conditions up to 24 months post-infection
- **Mahmoud Gheblawi**, PhD Student, University of Alberta, Translational Implications of SARS-CoV-2 Mediated Loss of ACE2 in a Diabetic Obese Setting: Implications for Long COVID
- **Stephanie Haynes**, MSc Student, McGill University, Rehabilitation Service Utilization Among Individuals with Long-COVID
- **Rashmin Hira**, Master's Student, University of Calgary, Persistent objective cardiovascular autonomic abnormalities and symptoms in patients with Long-COVID
- **Jaylyn Leighton**, Postdoctoral Trainee, Sunnybrook Research Institute, Co-Designing a Long COVID Education and Awareness Hub: Addressing psychosocial needs across the continuum of care
- **Marc-André Limoges**, MSc Student, Université de Sherbrooke, SARS-CoV-2 spike antigen-specific B cell and antibody responses in pre-vaccination period COVID-19 convalescent individuals with or without post-covid condition
- **Parinaz Parhizgar**, Postdoctoral Fellow, University Health Network, Incidence of New-Onset Diabetes in a Cohort of COVID-19 Patients
- **Julia Rybkina**, MSc student, KITE Toronto Rehab, University Health Network, Healthcare Study for Long COVID Persisting Symptoms (HELPS): Empowering Patients through Health Literacy
- **Chen-Yang Su**, PhD student, McGill University, Combining proteomics and metabolomics to identify signatures protective of neurological consequences of post-acute SARS-CoV-2 infection



## Appendix D – Scientific Publications Influenced by Members’ Involvement in LCW

2023 (n=13)

\*LCW members in bolded text

Chen X, **Bakal J**, Whitten T, Waldie B, **Ho C**, Wright P, Hassam S, Norris C. Protocol: Assessing the impact of COVID-19 pandemic on the health of residents and the healthcare system in Alberta, Canada: an observational study. *BMJ Open*. 2023 Feb 17;13(2):e067449. DOI: 10.1136/bmjopen-2022-067449

DeMars J, Brown DA, Angelidis I, Jones F, McGuire F, **O’Brien KK**, Oller D, Pemberton S, Tarrant R, Verduzco-Gutierrez M, **Gross DP**. What is safe Long COVID rehabilitation? *J Occup Rehabil*. 2023;33:227–230. <https://doi.org/10.1007/s10926-022-10075-2>

Katz GM, Bach K, **Bobos P**, **Cheung AM**, **Décary S**, **Goulding S**, Herridge MS, McNaughton CD, Palmer K, **Razak F**, Zhang B, **Quinn KL**. Understanding How post-COVID-19 condition affects adults and health care systems. *JAMA Health Forum*. 2023;4(7):231–933. <http://dx.doi.org/10.1001/jamahealthforum.2023.1933>

McAlister F, Nabipoor M, Wang T, **Bakal JA**. Emergency visits or hospitalizations for cardiovascular diagnoses in the post-acute phase of COVID-19. *JACC Adv*. 2023 Aug;2(6). <https://doi.org/10.1016/j.jacadv.2023.100391>

**Oudit GY**, Wang K, Viveiros A, Kellner MJ, Penninger JM. Angiotensin converting enzyme 2 – at the heart of the COVID-19 pandemic. *Cell* (2023),186:906–922. <https://doi.org/10.1016/j.cell.2023.01.039>

**Parhizgar P**, Yazdankhah N, Rzepka AM, Chung KYC, Ali I, Lai R, Russell V, **Cheung AM**. Beyond acute COVID-19: A review of long-term cardiovascular outcomes. *Canadian Journal of Cardiology*. 2023;39(6): 726–740. <http://dx.doi.org/10.1016/j.cjca.2023.01.031>

**Pouliopoulou DV**, Macdermid JC, Saunders E, Peters S, Brunton L, Miller E, **Quinn KL**, Pereira TV, **Bobos P**. Rehabilitation Interventions for Physical Capacity and Quality of Life in Adults With Post-COVID-19 Condition: A Systematic Review and Meta-Analysis. *JAMA Netw Open*. 2023. Sep 5;6(9):e2333838. DOI: 10.1001/jamanetworkopen.2023.33838



## Appendix D – Scientific Publications Influenced by Members’ Involvement in LCW (Continued)

**Quinn KL, Lam GY, Walsh JF, Bhéreur A, Brown AD, Chow CW, Chung CKY, Cowan J, Crampton N, Décarý S, Falcone EL, Graves L, Gross DP, Hanneman K, Harvey PJ, Holmes S, Katz GM, Parhizgar P, Sharkawy A, Tran KC, Wasserman S, Zannella VE, Cheung AM.** Cardiovascular considerations in the management of people with suspected Long COVID. *Can J Cardiol.* 2023;39(6):741-753. <https://doi.org/10.1016/j.cjca.2023.04.003>

**Quinn KL, Razak F, Cheung AM.** Diagnosing the Post COVID-19 Condition (Long COVID) in Adults. *CMAJ.* 2023;195(2) E78-E79. (Quinn KL, Razak F, Cheung AM. Diagnostiquer le syndrome post-COVID-19 (COVID-19 de longue durée) chez l’adulte. *CMAJ.* 2023;195(9):E346-E347.) DOI: <https://doi.org/10.1503/cmaj.220818> <https://www.cmaj.ca/content/cmaj/195/2/E78.full.pdf>

**Quinn KL, Razak F, Cheung AM.** Assessing common and potentially modifiable symptoms of post-COVID-19 condition (long COVID) in adults. *CMAJ.* 2023;195(2):E76-E77. (Quinn KL, Razak F, Cheung AM. Évaluation des symptômes courants et potentiellement modifiables du syndrome post-COVID-19 (COVID-19 de longue durée) chez l’adulte. *CMAJ.* 2023;195(9):E348-E349.) DOI: <https://doi.org/10.1503/cmaj.220823> <https://www.cmaj.ca/content/195/2/e76>

**Quinn KL, Cheung AM, Razak F.** Treating common and potentially modifiable symptoms of post-COVID-19 condition (long COVID) in adults. *CMAJ.* 2023;195(2): E80-E81. (Quinn KL, Cheung AM, Razak F. Traiter les symptômes courants et potentiellement modifiables du syndrome post-COVID-19 (COVID-19 de longue durée) chez l’adulte. *CMAJ.* 2023;195(2): E80-E81) <http://dx.doi.org/10.1503/cmaj.220824> <https://www.cmaj.ca/content/195/2/E80>

Wang K, **Khoramjoo M**, Srinivasan K, Gordon PMK, Mandal R, Jackson D, Sligl W, Grant MB, Penninger JM, Borchers CH, Wishart DS, Prasad V, **Oudit GY.** Sequential multi-omics analysis identifies clinical phenotypes and predictive biomarkers for long COVID. *Cell Rep Med.* 2023 Nov 21;4(11):101254. DOI: 10.1016/j.xcrm.2023.101254. Epub 2023 Oct 26

Yamga E, Soulé A, **Piché A**, Emad A, Durand M, **Rousseau S.** Validation of vascular biomarkers associated with post-COVID-19 conditions in the Biobanque québécoise de la COVID-19 (BQC19). *Clinical Proteomics.* 2023 Oct 24;20(1):44. DOI: 10.1186/s12014-023-09436-7

